Chapter Four

Results and Discussion

This chapter discusses the results of the formal study in Sections 4.1 to 4.3 in an attempt to answer the research questions stated in Chapter One. Sections 4.4 Section 4.5 reports the age effects and the task effects on null NPs. Section 4.6 is a summary of the main points of this chapter.

4.1 Null Subjects versus Null Objects

4.1.1 Results

This section presents the results related to the first research question of this study. As reviewed in Chapter Two, empirical studies (e.g., Hyams 1987 and Wang et al. 1992) have shown that missing subjects may be more frequently used than missing objects in young children's utterances, and this could be accounted for by null subject/object asymmetry. Let us see if this asymmetry can be observed in the present study.

First, let us compare the responses of the experimental groups to null subjects and null objects with that of the control group in the SS Task. There were eight questions (i.e., Qs 1, 2, 4, 6, 8, 13, 14, 16) including eight null subjects respectively. When a participant chose a null subject in each question, they were given one point. If a participant chose an overt subject in a question, no point was given. Similarly, there were other eight questions (i.e., Qs 3, 7, 9, 10, 15, 17, 19, 21) including eight null objects respectively for a participant to answer. Let us see how differently the adults and kindergarten children used null subjects and null objects in the SS Task in Table 4-1.

Table 4-1: Participants' Mean Scores of Null Subjects and Null Objects

Group	Type	Mean	SD
Experimental	Null subject	0.62	0.19
	Null object	0.27	0.17
Control	Null subject	0.68	1.30
	Null object	0.34	0.96

With regard to the experimental group, the mean scores of null subjects (0.62) were higher than those of null objects (0.27), as showed in Table 4-1. According to the paired-sample t-test, the kindergarten kids used null subjects and null objects significantly differently (p= .000) in that they used null subjects more than null objects. With regard to the control group, the mean scores of null subjects (0.68) were also higher than those of null objects (0.34). According to the paired-sample t-test, the adults used null subjects and null objects significantly differently (p= .000) as well. Both the kindergarten children and the adults gained significantly higher scores in the test items with null subjects than they did with null objects.

With regard to the null subjects, the mean scores gained by the control group (0.68) were higher than those gained by the experimental group (0.62). However, the paired-sample t-test showed that there was no significant difference in their uses of null subjects by the kindergarten children and the adults (p= .122). With regard to the null objects, the mean scores gained by the control group (0.34) were higher than those gained by the experimental group (0.27), and the paired-sample t-test revealed that the two groups used null objects significantly differently (p= .026).

Second, let us see the frequency counts of null subjects and null objects between the kindergarten children and the adults in the SR Task in Table 4-2.

Table 4-2: Participants' Frequency Counts of Null Subjects and Null Objects

Group	Type	Frequency counts
Experimental	Null subject	333
	Null object	169
Control	Null subject	63
	Null object	12

With regard to the kindergarten children, the frequency counts of null subjects (333) were higher than those of null objects (169). The *Chi*-square analysis indicated that the difference in the kindergarten children' uses of the two types of null NPs was significant (*Chi*-square=53.58, *p*= .000). With regard to the adults, the frequency counts of null subjects (63) were higher than those of null objects (12). The *chi*-square analysis indicated that there was a significant difference in their uses of the two clausal types (*Chi*-square =34.68, *p*= .000) as well. Both the kindergarten children and the adults produced significantly more null subjects than null objects.

Let us compare null subjects and null objects produced by the two groups. The total frequency counts of null subjects produced by the experimental group (333) were higher than those produced by the control group (63). The *Chi*-square analysis indicated that the difference was significant in the uses of null subjects between the two groups (*Chi*-square = 13.24, *p*= .000). With regard to the null objects, the frequency counts of the control group (12) were lower than the experimental group (169). According to the *Chi*-square analysis, the two groups used null objects significantly differently (*Chi*-square = 28.47, *p*= .000).

After comparing the use of null subjects and null objects between the kindergarten children and the adults, let us look at the mean scores of null subjects and null objects of the four age groups in Figure 4-1.

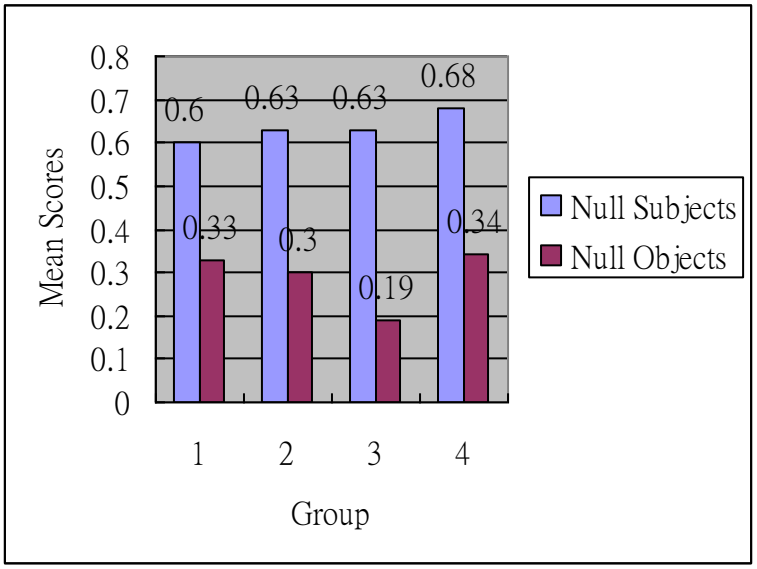

Figure 4-1: Mean Scores of the Null Subjects and Null Objects in the SS Task

As can be seen in Figure 4-1, the mean scores for choosing the null subjects by Groups 2 and 3 were higher than those of Group 1. The control group gained higher mean scores than the kindergarten children. To be more concise, the older subjects scored higher on the null subjects (0.68 > 0.63 = 0.63 > 0.60). Nevertheless, the One-way ANOVA indicated that there was no significant difference among the four groups in the SS Task (F =0.512, p= .616), implying that the kindergarten children and the adults performed quite alike in their choices of null subjects.

On the other hand, the control group gained higher scores than the kindergarten children in response to null objects. However, older kindergarten children gained lower scores for the null objects than the younger ones. Nevertheless, the One-way ANOVA indicated that all the three groups and the control group performed significantly differently (F = 2.787, p= .049), indicating that the kindergarten children and the adults did not respond to the null objects in the same way.

Let us see the frequency counts of the two clausal types in each group in the SR Task. As shown in Figure 4-2, for all of the four groups, the frequency counts of null

subjects were higher than those of null objects. The *Chi*-square analysis indicated that the difference was significant in the participants' uses of the two clausal types (*Chi*-square = 72.78, *p*= .000). All of the four groups produced significantly more null subjects than null objects.

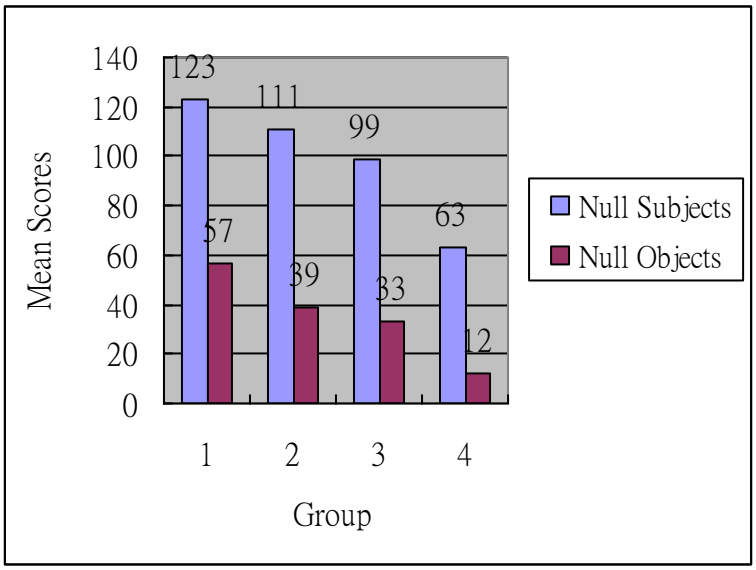

Figure 4-2: Frequency Counts of the Null Subjects and Null Objects in the SR Task

Let us see the mean frequency counts of the four groups for null subjects and null objects respectively. It was found that there was a high proportion of Group 1 for the null subjects, and the *Chi*-square analysis indicated that the difference among the groups in the uses of null subjects was significant (*Chi*-square = 62.83, *p*= .000). On the other hand, it was also found that Group 1 produced a high proportion of null objects, and the *Chi*-square analysis indicated that the difference among the four groups in the uses of null objects was significant (*p*= .000).

4.1.2 Discussion

As hypothesized in Section 3.4, missing subjects would be more frequently used than missing objects in young children's utterances (Wang et al. 1992, Hyams and

Wexler 1993). In the SS Task of the present study, the adults and the kindergarten children performed significantly differently in response to null subjects and null objects. That is to say, they gained significantly higher scores in null subjects than null objects. It has also been found in the SR Task that both the kindergarten children and the adults used null subjects and null objects significantly differently. They produced null subjects significantly more than null objects. In other words, missing subjects were much more frequently found than missing objects in both young children's and adults' narratives in the SR Task.

With regard to age differences, the findings of the SR Task supported the idea that the proportion of Chinese subjectless sentences decrease when speakers grow older. That is to say, younger children tended to drop a subject more often than older kids. According to Wang et al.'s (1992), when Chinese children's MLU increased, their uses of null subjects decreased, and the uses of null objects increased. In the present study, all the kindergarten children tended to drop subjects more often than the adults, which was in accordance with the findings of Wang et al. (1992) and Kim (2000). On the other hand, Hyams (1986) proposed that children begin with the [+*pro*-drop] parameter, and the children change the setting of the Null Argument Parameter and use no subjects. In contrast, Valian (1990a, 1990b, 1991, and 1994) proposed that the parameter shall be initially unset. Empirically, Wang et al.'s results (1992) and the present results are against Hyam's proposal since our older children still used null subjects, even though their number of null subjects decreased over time.

Interestingly, we found in the SS Task that null subjects increased with age, but the difference in the use of null subjects among the groups was not significant. In contrast, our older kindergarten children tended to choose null objects less than our younger ones, but the adults chose null objects more than the kindergarten children. Despite this, there was no significant difference in the use of null objects among the

groups. We concluded that the children had acquired the notion of null NPs (either null subjects or null objects) from three to four years old. The kindergarten children, as the adults, have the contextual awareness to judge where to use null NPs in the SS Task, but they tend to drop more subjects and objects than the adults do in the SR Task. Null subjects in the present study shall be analyzed as *pro*s, whereas null objects could be analyzed as variables bound by a topic[13].

4.2 Overt Expletive Pronouns versus Null Expletive Pronouns

This section presents the results related to the second research question of the present study and then discusses whether referentiality plays a role in the choices or production of non-referential subjects.

4.2.1 Results

It is presupposed that the expletive pronoun *ta* 'it' may be present or absent in the sentences chosen or produced by the participants in the present study[14], as

12 There were several approaches to the null object construction (NOC): variable analysis (Huang 1982, 1984, 1987, 1989), null epithet analysis (Huang 1991), and Free Empty Category analysis (Xu 1986). Huang (1982, 1984, 1987, and 1989) claims the null objects shall be a variable bound by a null topic. On the other hand, Huang (1991) argues that Chinese null objects shall be considered to be the null counterpart of an epithet. However, Huang (2008) showed that Huang's (1991) null epithet analysis is only partly correct and argued that this type of null objects actually is a covert pronoun subject to Binding Principle B. In contrast, Xu (1986) suggests that since the null object in Chinese can be both a *pro* and a null anaphor, it is an instance of a free empty category, which reference can only be recovered from the context in which it is used (where the context can be either linguistic or pragmatic). Huang (2008: 76) shows that there are three types of Chinese null objects, i.e., null topic-bound variable objects, pronominal objects, and null cognate objects. Since most of the classifications above were not related to the main points discussed in the present study, only Huang's analyses (1982, 1984, 1987, and 1989) were implied to account for the use of null objects.

14 The use of the overt expletive *ta* is ill-formed. However, some participants chose or used it in the present study, and this phenomenon is discussed in Section 4.2.2.

exemplified in (1).

(1) (*Ta) Xiayu le.

it rain LE

'It is raining.'

The expletive pronoun *ta* 'it' may be present or absent in other types of clauses, too. For instance, it may occur in embedded or adverbial clauses, as shown in (2) and (3).

(2) Wo cai (*ta) xiayu le.

I guess it rain LE

'I guess it is raining.'

(3) Yinwei (*ta) xiayu le, Zhangsan jiu bu qu dalanqiu le.

CAUSE it rain LE Zhangsan then Neg go play ball LE

'Zhangsan will not go (to) play basketball because it is raining.'

As discussed in Section 4.1.1.1, in the SS Task, there were four questions about non-referential subjects in terms of three different clausal types, i.e., matrix, embedded, and adverbial clauses. When a participant chose the clause with a null expletive pronoun, one point would be given. In contrast, no point would be given if a participant chose the clause with an overt expletive pronoun. Let us see how different the adults and kindergarten children used null expletive pronouns and overt expletive pronouns in the SS Task in Table 4-3.

Table 4-3: Participants' Mean Scores of Null and Overt Expletive Pronouns

Group	Type	Mean	SD
Experimental	Null Expletive Pronouns	0.86	0.27
	Overt Expletive Pronouns	0.14	0.12
Control	Null Expletive Pronouns	0.98	0.21
	Overt Expletive Pronouns	0.02	0.09

Let us see the mean scores of the two groups for the two clausal types. With regard to the experimental group, the mean scores of null expletive pronouns (0.86) were higher than those of overt expletive pronouns (0.14). According to the paired-sample t-test, the kindergarten participants used null and overt expletive pronouns significantly differently (t = - 7.956, p= .000) in that they used more null expletive pronouns than overt expletive pronouns.

With regard to the adults, they scored higher null expletive pronouns (0.98) than those of overt expletive pronouns (0.02), as can be seen in Table 4-3. According to the paired-sample t-test, just as the cases of the kindergarten children, the adults used significantly more null expletive pronouns than overt expletive pronouns (t = - 42.560, p= .000).

Second, let us compare the production of null expletive pronouns and overt expletive pronouns by the experimental and control groups in the SR Task in Table 4-4.

Table 4-4: Participants' Frequency Counts of Null Expletive Pronouns and Overt Expletive Pronouns

Group	Type	Frequency counts
Experimental	Null expletive pronoun	230
	Overt expletive pronoun	1
Control	Null expletive pronoun	49
	Overt expletive pronoun	0

Let us see the frequency counts of the two clausal types (i.e., null expletive pronouns and overt expletive pronouns) of each group. With regard to the experimental group, the frequency counts of null expletive pronouns (230) were higher than those of overt expletive pronouns (1). The *Chi*-square analysis indicated that the difference was significant in the kindergarten children' uses of the two clausal types (Chi-square=53.58, *p*= .000). With regard to the adults, the frequency counts of null expletive pronouns (49) were higher than those of overt expletive pronouns (0). The *Chi*-square analysis indicated that the difference was significant in the adults' uses of the two clausal types (Chi-square=34.68, *p*= .000). Both the kindergarten children and the adults produced significantly more subjects than objects.

Let us see the mean frequency counts for each of the two clausal types of each group. With regard to the null expletive pronouns, the mean frequency counts produced by the experimental group (77) were higher than those produced by the experimental group (1). The *Chi*-square analysis indicated that the difference was significant in their uses of null expletive pronouns (Chi-square = 13.24, *p*= .000). With regard to the overt expletive pronouns, the mean scores gained by the control group (16) outnumbered those gained by the experimental group (0). According to the *Chi*-square analysis, the kindergarten children and the adults used overt expletive pronouns significantly differently (Chi-square = 28.47, *p*= .000).

The contrasts of the mean scores of the null expletive pronouns and overt expletive pronouns can be seen in Figure 4-3.

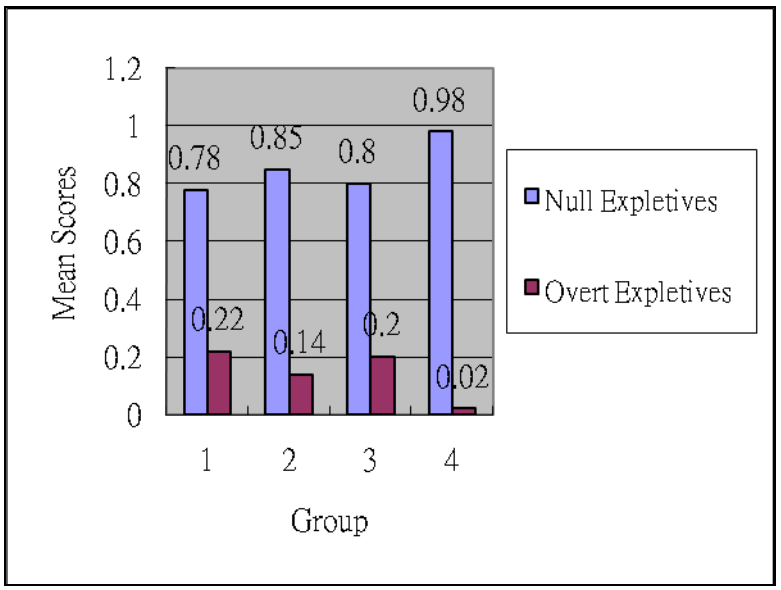

Figure 4-3: Mean Scores of the Null and Overt Expletive Pronouns in the SS Task

As can be seen in Figure 4-3, the mean scores of choosing the null expletive pronouns by Group 2 were higher than those found in Groups 1 and 3. The control group gained a higher mean score than the kindergarten children. The One-way ANOVA indicated that there was no significant difference between the experimental and control groups (F =0.512, *p*= .616).

As can be seen in Figure 4-3, the mean scores of choosing the overt expletive pronouns by the control group were higher than those of the other groups. The control group gained higher mean scores than the kindergarten children. Nevertheless, the One-way ANOVA indicated that all the three groups and the control group performed similarly (F =2.787, *p*= .049).

Figure 4-4 presents the frequency counts of the null expletive pronouns and overt expletive pronouns by each group in the SR Task.

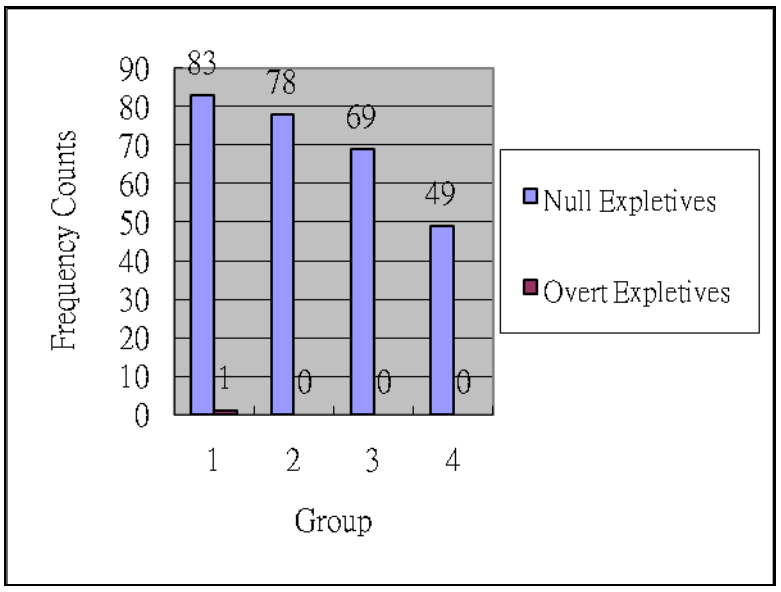

Figure 4-4: Frequency Counts of the Null and Overt Expletive Pronouns in the SR Task

As shown in Figure 4-4, a high proportion of null expletive pronouns was obtained from Group 1. The *Chi*-square analysis indicated that the difference in the uses of null expletive pronouns was significant in different age groups (p= .037). With regard to overt expletive pronouns, we found that only Group 1 had one overt expletive pronoun, whereas there was no overt expletive pronoun in the other three groups. However, the *Chi*-square analysis indicated that the difference in the uses of overt expletive pronouns was not significant (p= .857).

On the other hand, let us look at how each group used null expletive pronouns and overt expletive pronouns differently. It was found that in the SR Task there was a high proportion of the type of null expletive pronouns. The *Chi*-square analysis indicated that the difference was significant in the participants' use of the two types of NPs (p= .000).

4.2.2 Discussion

As presented in Chapter Two, null NPs have either a non-referential or a referential interpretation (Huang 1989). For instance, as shown in (4), the null expletive subject has a non-referential interpretation.

(4) (*Ta)[15] xiayu le.

it rain LE

'It is raining.'

Empirically, Wang et al. (1992) found that the kindergarten children seldom used *ta* 'it' to refer to the expletive pronoun (only 2 %), but they would rather drop the expletive pronoun as Chinese adult speakers usually do. Let us see if this finding could be supported by the results of the present study. Let us firstly take a look at the results in the SS Task. As we know, the expletive *ta* 'it' shown in (4) is ungrammatical to most of Chinese native speakers. It is reasonable to find in the SS Task that only null non-referential subjects would be chosen by the participants. Nevertheless, it was found in the SS Task that the expletive *ta* 'it' was chosen by some kindergarten children in some contexts, as presented in Figure 4-5.

As reported in Figure 4-5, the higher scores the participants gained, the more they chose null expletive pronoun. It seemed that the subjects tended to use a null non-referential subject rather than to use an overt non-referential subject, i.e., expletive *ta* 'it'. On the other hand, among the three different clausal types, the participants used null expletive pronouns in adverbial clauses most, except for the control group.

[15] In Chinese, the use of an overt expletive *ta* is ungrammatical. However, some kindergarten children in the present study chose an overt expletive *ta*. They might choose *ta* to refer to an antecedent in the discourse, e.g., *tianqi* 'the weather.'

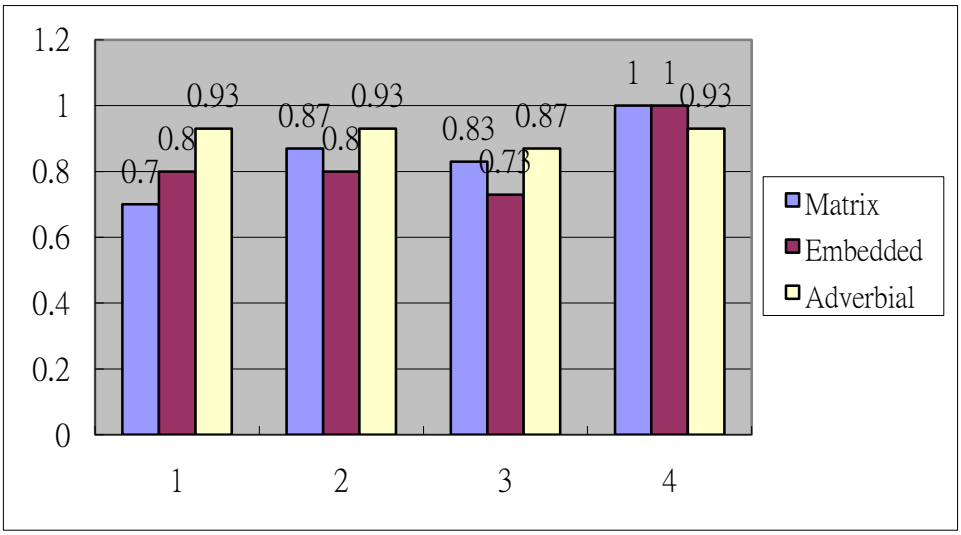

Figure 4-5: Participants' Mean Scores of the Null and Overt Expletive Pronouns in the SS Task

Haegeman (2000) proposes that either referential or non-referential instances of adult null subjects were best accounted for as antecedentless empty categories. Even so, some participants, mostly the kindergarten children, may consider the antecedent of the non-referential subjects as a certain antecedent in the previous discourse so that the expletive *ta* 'it' would be chosen in the SS Task. For instance, the expletive *ta* 'it' may refer to *tianqi* 'the weather,' and this can be used to explain why some younger kindergarten children such like those in Group 1 would choose this item.

In contrast, in the SR Task, the kindergarten children seldom used the overt expletive pronoun *ta* 'it,' and there was no occupancy of *ta* 'it' in the adults' data. There were four sample sentences that consisted of four expletive pronouns for the participants. Take (5) for example.

(5) Turan xiayu le. Dayelang jiu shuo, φ xiayu le. Kuai rang wo jinlai.
suddenly rain LE Big Wof then said rain LE hurry let me enter
'Suddenly it rained. Big Wof said, "It is raining, Hurry up to let me enter (the house)." '

As illustrated in (5), even if not every subject would address all the four sentences, they usually used a null expletive pronoun (frequency counts: 230) rather than an overt expletive *ta* 'it' (frequency counts: 1) to refer to a non-referential NP. There was only one occurrence of overt expletive pronoun, as shown in (6).

(6) Tianqi hen hao, *ta chutaiyang le.
weather very well it sunny LE
'The weather is well, and it is sunny.'

We assume that the overt expletive pronoun *ta* 'it' would be chosen because it could be identified or licensed by the antecedent *tianqi* 'weather.' The adults did not use any expletive *ta* 'it' to refer to a non-referential NP in their narratives in the present study.

4.3 Null Subjects/objects in Matrix, Embedded, and Adverbial Clauses

This section presents the results related to the third research question and discusses whether the participants' used null NPs differently in various types of clauses categorized in Chapter Three.

4.3.1 Results

Table 4-5 presents the mean scores of the participants for null subjects in the three clausal types. Let us first compare the kindergarten children' mean scores with the adults' for null subjects in the three clausal types.

Table 4-5: Participants' Mean Scores for Null NPs in Three Different Clausal Types

Type / Group	Matrix		Embedded		Adverbial	
Experimental	Mean	SD	Mean	SD	Mean	SD
	0.57	1.22	0.43	0.61	0.48	0.56
Control	Mean	SD	Mean	SD	Mean	SD
	0.40	0.74	0.50	0.41	0.75	0.59

With regard to NPs in matrix clauses, the mean scores gained by the experimental groups dominated those gained by the control group. However, according to the paired-sample t-test, the groups performed insignificantly differently (p= .256). This meant there was no significant difference in the choices of null NPs in matrix clauses between the kindergarten children and the adults.

With regard to NPs in embedded clauses, the mean scores gained by the control group were higher than those gained by the experimental group. Nevertheless, the paired-sample t-test indicated that there was no significant difference between the kindergarten children and the adults in their choices of null NPs in embedded clauses (p= .327).

With respect to NPs in adverbial clauses, the control group gained higher mean scores than the experimental groups. According to the paired-sample t-test, there was a significant difference in the choices of null NPs in adverbial clauses between the kindergarten children and the adults (p=.011).

Let us take a look at the mean scores of null NPs in the three different clausal types gained by the four groups in Table 4-6. As can be seen in Table 4-6, the mean scores of choosing null NPs in matrix clauses by Group 2 were higher than those of the other three age groups. However, the One-way ANOVA indicated that there was no significant difference between the kindergarten children and the adults in their

choices of null NPs in matrix clauses (*p*= .286).

Table 4-6: Participants' Comprehension of Null NPs in Three Clausal Types

	Group 1		Group 2		Group 3		Control Group	
Matrix	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	0.47	1.46	0.48	1.24	0.39	0.99	0.40	0.74
Embedded	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	0.47	0.68	0.45	0.59	0.37	0.52	0.50	0.41
Adverbial	Mean	SD	Mean	SD	Mean	SD	Mean	SD
	0.39	0.52	0.47	0.56	0.57	0.51	0.75	0.59

With regard to NPs in embedded clauses, Table 4-6 shows that Group 3 gained especially lower scores than other three groups. However, the One-way ANOVA indicated that there was a significant difference between Group 3 and Group 4.

With regard to null NPs in adverbial clauses clauses, the control group gained higher mean scores than the kindergarten children, as shown in Table 4-6. To be more concise, the older children gained higher scores for null NPs in adverbial clauses. The One-way ANOVA indicated that there was a significant difference between Group 1 and Group 4, and that there was a significant difference between Group 2 and Group 4. This meant there was a significant difference between the kindergarten children and adults in their choices of null NPs in adverbial clauses.

Let us see the frequency counts of the three clausal types produced by the experimental group and the control group in Table 4-7. With regard to the experimental group, the frequency counts of null NPs in adverbial clauses (167) were higher than null NPs in the other two clausal types. The *Chi*-square analysis indicated that the difference was significant in the kindergarten children' uses of the three clausal types (*Chi*-square= 53.58, *p*= .000). With regard to the control group, the frequency counts of null NPs in adverbial clauses (48) also were higher than the other two clausal types. The *Chi*-square analysis showed that the difference was significant

in their uses of the three clausal types (*Chi*-square = 34.68, *p*= .000). Both of the kindergarten children and the adults produced significantly more null NPs in adverbial clauses than null NPs in the other two types of null NPs.

Table 4-7: Participants' Frequency Counts of Null NPs in Three Clausal Types

Group	Type	Frequency counts
Experimental	Matrix	43
	Embedded	71
	Adverbial	167
Control	Matrix	5
	Embedded	10
	Adverbial	48

In the experimental group, the frequency counts of the NPs in embedded clauses (71) were higher than the matrix ones (43). The *Chi*-square analysis indicated that the difference was significant in the kindergarten children' uses of the two clausal types (*Chi*-square= 6.88, *p*= .009). With regard to the adults, there were also more occurrences of null NPs in embedded clauses (10) than the ones in matrix clauses (5). However, the *Chi*-square analysis indicated that the difference was insignificant in the adults' uses of the two clausal types (*Chi*-square =1.67, *p*= .197). The kindergarten children, but not the adults, produced significantly more null NPs in embedded clauses than null NPs in matrix clauses.

Table 4-8 presents the frequency counts of the three clausal types by the participants in the SR Task. As shown in Table 4-8, a high proportion was obtained from Group 1 in each of the three clausal types. However, the *Chi*-square analysis indicated that there was no significant difference among the uses of null NPs by the four groups in the three clause types (*p*= .23).

Table 4-8: Participants' Performances on Null NPs in Three Clausal Types

Group	Type	Frequency counts
1	Matrix	16
	Embedded	28
	Adverbial	79
2	Matrix	14
	Embedded	25
	Adverbial	72
3	Matrix	13
	Embedded	19
	Adverbial	67
Control	Matrix	5
	Embedded	10
	Adverbial	48

On the other hand, if we compare null NPs in matrix clauses with those in embedded clauses in each group, the *Chi*-square analysis indicated that the differences in the uses of the two clausal types were all non-significant (p= 0.06, 0.78, and 0.29 for Groups 1, 2, and 3, respectively).

4.3.2 Discussion

As presented in Section 2.2.1, both matrix and embedded subjects can be deleted in Chinese as long as they were pragmatically inferable. However, Kong (2005), following Huang (1984), assumed that a null embedded subject can refer to the subject in the matrix clause or someone mentioned in the previous discourse. He further showed in his study (2005) that Chinese learners of English appeared to have more trouble detecting the need for overt subjects in embedded clauses than overt subjects in matrix clauses. Thus, we may assume that a null embedded NP will be more easily to be selected than a matrix NP. In the SS Task, it was found that the kindergarten children gained higher scores for choosing null NPs in matrix clauses than those for choosing null NPs in embedded clauses. In contrast, the adults gained

higher scores in the test items concerning null NPs in embedded clauses than those in the items concerning null NPs in matrix clauses. However, there was no significance between the scores in the two types of clauses (p >0.05) within each of the two groups. In contrast, the participants in the experimental group produced null NPs in embedded clauses significantly more than null NPs in matrix clauses in the SR Task, but the significance was not found in the adults' data. We might conclude that both the kindergarten children and the adults comprehended the NPs in matrix clauses similar to the conditions they comprehended the ones in embedded clauses.

As presented in Chapter Two, it was hypothesized that the subjects in Chinese were obligatorily omitted in adverbial-constructions (Li and Thompson 1978); however, as exemplified by Li and Thompson in (7), the null subject that refers to *Zhangsan* occurs in the main clause rather than in the adverbial clauses.

(7) Zhangsan$_i$ qu le meiguo yihou, (Li and Thompson 1978)
Zhangsan go LE American after
φ$_i$ jiu bu gaoxing.
then not happy.
'After Zhangsan went to American, he is not happy'

Kawamura (2008) showed that there are two distinct types of adverbial *because*-phrases observed by Rutherford (1970) and Hooper and Thompson (1973): the restrictive *because*-phrase as in (8) and the nonrestrictive *because*-phrase as in (9).

(8) Sam is going out for lunch [because his wife is cooking Japanese food]. (restrictive)

(9) Sam is going out for dinner, [because I just talked to his wife]. (non-restrictive)

According to Kawamura (2008), the because-phrase in (8) provides the reason for Sam's actions in the main clause. In contrast, the because-phrase in (9) explains how the speaker came by the knowledge of Sam's actions in the main clause. Hooper and Thompson (1973) claim that the restrictive and non-restrictive because-phrases are different in their informational structures. The restrictive because-phrase as in (8) expresses the main assertion of the sentence and the information in the main clause is presupposed. It is worthy to note that the main assertion is in the restrictive because-phrase (i.e., the cause is his wife's cooking of Japanese food.) In contrast, in non-restrictive because-constructions such as (9), the main clause expresses the main assertion. The restrictive *because*-phrases were inherently emphasized and essential to the meaning of the whole sentence in (9). We further assume that a null NP shall be more easily to be used in a clause that is presupposed, whether the clause is a main clause or in a non-restrictive because-clause. This can also account for how some participants would choose a null NP in a non-restrictive adverbial clause that is presupposed, as shown in (10).

(10) Tamen zhua-bu-dao yu, suoyi φ hen nanguo.
they can-not-get fish so very sad
'They cannot get fish, so they were sad.'

In contrast, in (7) a null NP would occur in a main clause that is presupposed when the adverbial clause is restrictive. We adapt Li and Thomson's ideas and assume that subjects in Chinese adverbial-constructions that include a main clause and an adverbial could be omitted.

In the SS Task, the control group gained 0.87 for each question for the null NPs in adverbial clauses, while the mean scores of the other three groups were 0.40, 0.67, and 0.67, respectively, implying that the older subjects could comprehend better than

the younger ones according to this hypothesis. Besides, the adults tended to choose null NPs rather than overt pronouns in adverbial clauses and gained significantly higher scores than the kindergarten children. We may conclude that the present results from the adults' data supports the assumption that Chinese speakers tend to drop NPs in adverb-constructions, even though this type of NPs were not omitted by the participants all the time. On the other hand, Yeh (2001) adopted Levinson's (1983) M-principle (i.e., Manner-principle) as shown in (11) to account for the differences between Chinese *ziji* and *ta- ziji*, and this principle could be used to explain the present results.

(11) *Levinson's M-principle*

Speaker 's maxim: Do not use a marked (relatively complex and/or prolix) expression without reason.

Recipient's corollary: If the speaker used a prolix or marked expression M, he did not mean the same as he would have had he used the unmarked expression U— specifically he was trying to avoid the stereotypical associations of U.

With the M-principle, Yeh (2001) argued though both *ziji* and *ta- ziji* can be used to invite a coreferential interpretation with the subject NP, by the M-principle, it should be the bare *ziji*, the morphologically simpler and thus the unmarked, that was mostly selected. We can also use this notion to account for the use of null NP in an adverbial clause. When a null NP is morphologically simpler than an overt NP, the participants, especially the adults, tended to choose null NPs rather than overt NPs.

However, the adverbial clauses included in the SS Task were all with expressions of cause and effect. Even the sample sentences for the participants to listen to were the same case. As we know, Chinese *yinwei* 'because' is a temporal adverbial that

connects a main clause with the cause and one or more clauses with the effects (to explain the reasons for what happens in the main clause). *Yinwei* 'because' can be seen as a marker that creates cohesion and coherence by forming continuity in the text and also signals textual boundaries that occur on different hierarchic levels (Tuiji 1992). We may assume that a null NP shall be easily referred to the subject or object in the same cause-and-effect device due to the property cohesion, coherence, and continuity in such types of clauses. These properties are helpful for the disambiguity of null NPs, and we may assume that since the low ambiguity of an NP in an adverbial clause, it tends to be omitted, as supported by the findings of the control group. And the kindergarten children of the present study have not acquired the notion as well as the adults have.

4.4 Age Effects

In Sections 4.1, 4.2, and 4.3, we have presented the main results according to the first three research questions mentioned in Chapter One. In this section, the age effects on null NPs involved in the fourth research question will be addressed in this section.

The participants of Group 1 have acquired null NPs (including null subjects and null objects), null NPs in matrix clauses, and null NPs in embedded clauses before the time the data were elicited. Let us analyze null NPs (including null subjects and null objects) first. According to the data in Wang et al. (1992), when Chinese children's MLU increased, the mean percentage of sentences with null objects increased. As found in the SS Task, there were no significant age differences among the four groups in the mean scores either for null subjects or for null objects (as shown in Figure 4-1). On the other hand, in the SR Task significant differences in either null subjects or null objects were found among the groups. Null subjects decreased over time in the preset

study, and this finding was in accordance with Wang et al. (1992) and Kim (2000). Nevertheless, null objects also decreased as the kindergarten children grew older, and this finding was contradictory to Wang et al. (1992). To sum up, our Chinese-speaking children tended to drop objects less frequently than they omitted subject.

With regard to null NPs in matrix and embedded clauses found in the SS Task, there were no significant differences among the four groups in the mean scores for each of the two types of NPs (as shown in Table 4-6). In contrast, in the SR Task, null subjects in matrix and embedded clauses decreased with the growth of age, but the age difference was not obvious. According to the present results, null NPs (including null subjects and null objects), null NPs in matrix clauses, and null NPs in embedded clauses emerged before age four. Our kindergarten children young as Group 1 have acquired the three types of NPs and have almost reached the adult level.

Group 2 have acquired null expletive pronouns. According to Wang et al. (1992), children would use null expletives as the adults do. It was found that there were no significant differences in the choices of null expletive pronouns between the kindergarten children and the adults in the SS Task. However, there was a significant difference between Group 1 and Group 4 according to the post hoc Scheffe analysis, and we may assume that the kindergarten children young as Group 1 have not acquired null expletive pronouns, whereas those were young as Group 2 have acquired null expletive pronouns and their competence has almost reached the adult level. In the SR Task, there were no significant differences in the choices of null expletive pronouns between the kindergarten children and the adults. However, there was only one occurrence of overt expletive pronoun found in Group 1, whereas Group 2 or older children have acquired null expletive pronouns.

Group 3 and the control group have acquired null NPs in adverbial clauses. According to Li and Thompson (1981), ssubjects in Chinese are obligatorily omitted

in adverbial phrases. In the SS Task, there was a significant difference in the choices of null NPs in adverbial clauses between the kindergarten children and the adults. In the SR Task, there was a significant difference in the production of null NPs in adverbial clauses between Group 1 and Group 4, according the post hoc Scheffe analysis. The kindergarten children that were older than 5 years old have acquired null NPs in adverbial clauses and have nearly reached the adult level. Both of the two tasks showed that there was a significant difference in the choices of null NPs in adverbial clauses between the kindergarten children and the adults.

Even if one type of NPs was used more frequently than the other, we could not assume that participants could use the more frequently-used type better than the other. In this way, we mainly take advantage of the results and findings in the SS Task rather than those in the SR Task for discussion. The differences of the two tasks will be shown and analyzed in the next section.

Following the analyses, Table 4-9 shows the distribution of the various NPs in which a check indicates that one type of NPs ever used by a group. Besides, an asterisk means that one type of NPs used by a group, but there was a significant difference between the number of the NP of the group and the control group. It was found that null NPs, null NPs in matrix clauses, and null significantly emerged even before age four. On the other hand, null expletives were not significantly frequently used by Group 1 but by the other three groups. Furthermore, null NPs in adverbial clauses were significantly frequently found in Groups 3 and 4.

Table 4-9: Distribution of the Types of Null NPs in the SS Task

	Null Nouns	Null expletives	Matrix	Embedded	Adverbial
Group 1	v	v*	v	v	v*
Group 2	v	v	v	v	v*
Group 3	v	v	v	v	v

Pierce (1992) assumes that a child is developing an adult grammatical system, and each development may generate various effects. According to Table 4-9, there are three main stages to fully acquire null NPs that can be defined accordingly: Stage 1: the significant emergence of null NPs, null NPs in matrix clauses, and null NPs in embedded clauses; Stage 2: the null expletives; and Stage 3: the null NPs in adverbial clauses, as shown in Figure 4-6 below.

Stage 1 (3; 1~3; 11): null NPs, null NPs in matrix clauses, and null NPs in
↓ embedded clauses
Stage 2 (4; 1 ~ 4; 11): + null expletives[16]
↓
Stage 3 (5: 1 ~ 5; 11): + null NPs in adverbial clauses

Figure 4-6: Developmental Stages Found in the SS Task

4.5 Task Effects

Different tasks have been employed in studying L1 acquisition (Brown 2000, Chen 2002, Wen and Wu 1997, etc.). To be balanced, both the comprehension task (i.e., the SS Task) and the production task (i.e., the SR Task) were adopted in the present study to see if the findings were in accordance with our hypotheses. The SS Task examined the subjects' instinct choices of Chinese null NPs with pictures and

[16] It does not mean that null expletives were only used by the participants who were older than 4 years old. According to the pair-sample t-test, the Chinese adults chose significantly more null expletives than Group 1 (3; 1~3; 11), but not than the other two groups. This implies that children older than 4 have fully acquired null expletives.

stimuli questions. The SR Task investigated the participants' use of Chinese null NPs according to the pictorial scenarios and the elicitation of story-retelling. Let us discuss the task effects in terms of the three research questions about null NPs, null expletive pronouns, and null NPs in three clausal types.

Comparing null subjects with null objects, there were similar findings in the SS and SR Tasks, i.e., the participants tended to drop the subjects significantly more than the objects. However, in the SS Task there were no age effects between any of the four groups in the use of null subjects and null objects. Similarly, in the SR Task it was found that null subjects and null objects decreased with the growth of age, but the significance was not obvious.

With regard to the use of null and overt expletive pronoun, it was found in both the SS and SR Tasks that the kindergarten children and the adults significantly chose or used null expletive pronouns rather than null overt ones. However, an asymmetry was found between the two tasks. No group effect was found in the SR Task. Adults did not use any overt expletive pronoun, and there was only one occurrence of overt expletive pronoun produced by a kindergarten child. In contrast, a group effect was found in the SS Task between Groups 1 and 4, implying that the kindergarten children as young as three to four years old have not fully acquired the notion of null expletive pronouns as the adults.

Furthermore, it was found that both in the SS and SR Task the adults dropped the NPs in adverbial clauses significantly more (or more frequently) than the kindergarten children. However, the difference of the two tasks was found in the use of null NPs in matrix and embedded clauses. In the SS Task, there was no significant difference in the participants' use of the two types of NPs. However, significant differences was found in the SR Task that null NPs in embedded clauses were used more frequently

than null NPs in matrix clauses[17]. The group effects were only found in null NPs in adverbial clauses. The control group chose or used null NPs in adverbial clauses significantly more than Group 1 did, and Group 3 chose or used null NPs in adverbial clauses significantly more than Group 1 did as well.

According to Gerken and Shady (1996), comprehension is prior to production[18]. In the present study, the use of an overt expletive pronoun, which is ungrammatical to most Chinese adult speakers, could be more easily revealed and observed in the SS Task. We assume that the participants comprehended the use of null NPs better than really produced null NPs. In other words, a participant could have the knowledge where to use a null NP in the SS Task but he/she might not produce such null NPs in his/her narratives in the SR Task.

4.6 Summary of Chapter Four

In this chapter, the results were analyzed and discussed in an attempt to answer the research questions proposed in Chapter One. In Section 4-1, the null subject/object asymmetry was found in both tasks that both the adults and the kindergarten children used significantly more null subjects than they made use of null objects. Both subjectless sentences and objectless sentences decrease with the growth of age in the SR Task, but such age difference was not observed in the SS Task. On the other hand, it was found in Section 4-2 that there was a significant difference on null NPs in terms of referentiality. It appeared that in both of the two tasks the participants tended to use a null non-referential subject rather than used an overt non-referential subject, i.e the expletive *ta* ‘it, ’ and “age” was not found to play an important role in this respect. In Section 4-3, it was found that the older the kindergarten children were, the more they would comprehend the meanings of null NPs in adverbial clauses in Chinese.

[17] This phenomenon can be accounted for by some ideas in Kong (2005) as discussed in Section 4.3.2.
[18] Some researchers show that sometimes production is prior to comprehension (e.g., Hoff 2001).

However, the age difference was not found on null NPs in matrix and embedded clauses. Besides, no significant within-group difference was found on null NPs among the three clausal types. In Chapter Five, the main findings of the present study and suggestions for further research will be offered.