CHILD ACQUISITION OF MANDARIN
Gēi benefactive pattern and Gēi lessive pattern

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ABSTRACT

This thesis investigates the acquisition of Mandarin-speaking children’s knowledge of the benefactive and lessive meanings of gěi-marked sentences. These two patterns follow the same surface word order but have different meanings, thus creating the potential for ambiguity. Employing a modified Truth Value Judgment Task, this study evaluates the role of frequency and semantics in child acquisition of these two patterns. The participants were 56 children aged between 3 to 5 years of age, 9 adolescent controls, and 74 adult controls. The experimental findings show that the majority of children seem to access the two gěi readings very early, but prefer gěi in a lessive manner. This is especially the case with the younger children (under 3;10). In contrast, both the adolescents and the adults have a strong preference for the benefactive reading of gěi, which is in line with the frequency of these two types of gěi patterns in corpora. However, children’s results are not in line with what was found in corpora. The present study indicates that frequency does not have a straightforward effect on child acquisition of the gěi benefactive pattern and the gěi lessive pattern, but that other factors (such as semantic extension) play an important role.
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CHAPTER 1
INTRODUCTION

1.1 The goal of the present study

This study investigates sentence patterns involving \( gēi \) (给) in child, adolescent, and adult Mandarin. The goal is to establish at what age the \( gēi \) patterns are acquired, and what factors affect its acquisition.

In Mandarin Chinese, \( gēi \) is not only a basic verb meaning ‘give’ but also a morpheme with multiple functions. \( gēi \) often co-occurs with other verbs in a variety of \( gēi \) patterns, including benefactive (malefactive), lessive, purposive, passive (Norman 1982; Thepkanjana & Uehara 2008; Xu 1994). \( gēi \) also has an idiomatic usage and an emphasis function. Despite these diverse uses of \( gēi \), natural speech data show that Mandarin-speaking children occasionally produce instances of all these \( gēi \) patterns even before the age of 3 (Qi & Yang 2008; Zhou & Wang 2001).

This thesis aims to investigate child acquisition of multiple \( gēi \) patterns, specifically, the \( gēi \) benefactive pattern and the \( gēi \) lessive pattern. These two \( gēi \) patterns follow the same word order of \( NP1 + gēi + NP2 + V (+ \ NP3) \), in which \( NP1 \) and \( NP2 \) are both animate (often human). In the \( gēi \) benefactive reading, some action is (intentionally) done for someone’s sake, as in (1a). In the \( gēi \) lessive reading, someone lets, gives permission, allows, or does not prevent someone else from accomplishing the following action (Mueanjai & Thepkanjana 2008; Wong 2009), as in (1b).
As (1) shows, these two gěi readings both follow the same surface word order but have different meanings, thus creating the potential for ambiguity. These two patterns will be more fully described in Chapter 2.

Some existing literature (e.g., Shultz & Pilon 1973), mainly on the basis of English-speaking children, has revealed the relatively late development of the ability to detect linguistic ambiguity.¹ My research aims to examine when the gěi benefactive reading and the gěi lessive reading become accessible to native Mandarin-speaking children aged between 3 and 5 years. The present study also provides a test case for evaluating usage-based approaches. The frequency counts in adult corpora show that gěi lessive occurrence is rare compared to gěi benefactive occurrence (Wong 2009). Thus the lessive gěi reading should be difficult for the child to acquire on a usage-based account. The present study will test whether the higher incidence of the gěi benefactive pattern correctly predicts the earlier acquisition of gěi in the benefactive meaning.

1.2 Research questions and methodology

This study investigates two basic questions:

¹ For instance, Shultz & Pilon (1973) reported that children detected phonological ambiguity first, and that the
Research Question 1: At approximately what age are the gēi benefactive reading and gēi lessive reading accessible to children?

Research Question 2: What factor(s) predict the order of acquisition of these two patterns?

I consider two hypotheses that predict the acquisition order of these two gēi patterns. One is the Frequency Effect Hypothesis in the usage-based tradition, which predicts that the more frequently occurring gēi benefactive pattern will be acquired first. The other is the Semantic Extension Hypothesis which predicts, on the ground of perceptual and cognitive predispositions, that children acquire the gēi lessive pattern earlier than the benefactive pattern. These two hypotheses will be more fully described in Chapter 3.

In order to assess these two hypotheses, I conducted a modified Truth Value Judgment Task to test children’s acceptability rates of gēi-benefactive and gēi-lessive sentence patterns. The analyzable results are from 56 Mandarin-speaking children aged between 3 and 5 years of age, 9 adolescent controls, and 74 adult controls. The acceptability rates are compared among children, adolescent controls, and adult controls. The experimental results are then compared with the frequencies of the two types of gēi patterns from adult language corpora (including both a spoken corpus and a written corpus), as well as child-directed speech drawn from the CHILDES corpus, i.e., the Tardif corpus (1993, in the CHILDES database, MacWhinney (2000)).

1.3 The organization of the thesis

The rest of the thesis is organized into six chapters. Chapter 2 examines Chinese gēi patterns, in particular the gēi benefactive pattern and the gēi lessive pattern. Chapter 3 puts forward the hypotheses in the literature, i.e., the Frequency Effect Hypothesis (FEH) and the
Semantic Extension Hypothesis (SEH), and their predictions. Chapter 4 describes the present study, including the task, materials, participants, and procedures. Chapter 5 reports the experimental results and main findings. Chapter 6 discusses the experimental results and recapitulates the conclusions.
CHAPTER 2
GĚI BENEFACTIVE PATTERN AND GĚI LESSIVE PATTERN

This chapter first briefly describes the broad pattern of sentences in Mandarin referred to as gěi patterns, followed by a more focused and detailed discussion of the gěi benefactive pattern and the gěi lessive pattern (the topic of this thesis), the ambiguity between these two gěi patterns, and their frequencies in both adult corpora and a child-directed speech corpus.

2.1 Gěi patterns

Gěi is one of the most frequently occurring multifunctional morphemes in Mandarin Chinese. It occurs in a variety of positions and serves different functions. Gěi is often identified as a highly polysemous morpheme (Huang 2009).

Gěi patterns can be broadly classified into three categories (Her 2006; Wong 2009): (1) full verb gěi, (2) postverbal gěi, and (3) preverbal gěi. The focus of this study is the different interpretations of the gěi benefactive pattern and the gěi lessive pattern, both of which are considered (3) preverbal gěi. Before discussing these in detail, as background, I provide short descriptions of (1) full verb gěi and (2) postverbal gěi, followed by a more thorough discussion of (3) preverbal gěi.

2.1.1 Full verb gěi

First of all, gěi is a full lexical verb meaning ‘give’ (Huang 2009; Wong 2009; Zhu 1979, 1983). It often introduces an indirect object in constructions parallel to ditransitive constructions in other languages like English, as in (1) (Huang, Li, Y. A., & Li, Y. 2009: 29).
(1) 他给了我一把剑。

\(\text{Tā } \text{gěi } \text{lè wǒ yī bā jiàn.} \)

he give PFV me one CL sword

‘He gave me a sword.’

\(\text{gěi} \) in (1) is used as a verb and not a so-called particle. Evidence for this includes the fact that it is the only verb-like element in the sentence (Wong 2009), and that it is modified by the aspectual marker \(\text{le} \), which typically indicates a verb.

2.1.2 Postverbal \(\text{gěi} \)

\(\text{gěi} \) may also occur with another main verb in the sentence, in which case it may occur either postverbally or preverbally. In postverbal \(\text{gěi} \) patterns, \(\text{gěi} \) comes after the main verb and before the indirect object, as in (2) (Wong 2009: 61).

(2)  a. 我送给他一本书。

\(\text{Wǒ } \text{sòng } \text{gěi } \text{tā yī běn shū.} \)

I send GEI him one CL book

‘I send him a book.’

b. 我送一本书给他。

\(\text{Wǒ } \text{sòng yī běn shū } \text{gěi } \text{tā.} \)

I send one CL book GEI him

‘I send him a book.’

The sentences in (2) are often labeled as the “dative construction,” although there has been an intense debate on whether \(\text{gěi} \) in (2a) and (2b) is a verb, a verbal particle, or a preposition, among others, and whether the (2a) and (2b) patterns are simply alternative expressions (Chao 1968;
Her 2006; Huang & Ahrens 1999; Li 1990; Li & Thompson 1981; Tang 1979; Ting & Chang 2004; Zhang 1990; Zhu 1979, 1983, among many others). This debate is beyond the scope of this thesis, and so I will move on to the focus of this thesis, which is the preverbal gěi patterns.

2.1.3 Preverbal gěi

Preverbal gěi is the most frequently occurring gěi position (Li & Thompson 1981). The preverbal gěi is also the most complicated because gěi serves various functions with different meanings. How many different kinds of functions gěi can have in this position has been hotly debated. The literature has (controversially) identified benefactive (malefactive), lessive (permissive), passive, purposive, idiomatic usage, among others (see Appendix I for the other kinds of preverbal gěi patterns found in the Tardif corpus (1993)).

Among the various preverbal gěi patterns, the gěi benefactive pattern is the most frequently used one (Her 2006; Li & Thompson 1981). The gěi lessive pattern is much less frequent than the gěi benefactive pattern (Wong 2009), but these two patterns follow the same word order and thus create the potential for ambiguity (Mueanjai & Thepkanjana 2008; Newman 1996). The other gěi patterns are not the focus of this study, and so they are not considered here. Now I will turn to a full discussion of these two gěi patterns.

2.2 Gěi benefactive pattern (gěi-BEN) and gěi lessive pattern (gěi-LESS)

The present study focuses on two gěi patterns: preverbal gěi conveying either the benefactive meaning (gěi-BEN henceforth) or the lessive meaning (gěi-LESS henceforth).
2.2.1 Gēi-BEN(EFACTIVE)

In gēi-BEN following the word order of [NP1 + gēi + NP2 + Verb + NP3], some action performed by NP1 brings about a good result to the animate entity NP2, as in (3).

(3)  a. 他给班里的人做过不少事情。  (Huang et al. 2009: 27)
    Tā gēi bān lǐ de rén zuò guò bù shǎo shìqíng.
    ‘He did quite a few things for the people of the class.’

    b. 我给你叠个大船。  (File: lc5.cha, Line: 2319, Tardif 1993)
    Wǒ gěi nǐ dié gè dà chuán.
    ‘I fold a big (paper) boat for (intended for/for the sake of) you.’

    c. 明天爸爸给你买蛋糕。  (File: ww2.cha, Line: 135, Tardif 1993)
    Míngtiān bābā gěi nǐ mǎi dāngāo.
    ‘Dad will buy a cake for (intended for/for the sake of) you tomorrow.’

NP1, the subject, is henceforth referred to as the agent of the action; NP2 is henceforth referred to as the benefactive, which refers to the person for whose sake some action is (often intentionally) done.

2.2.2 Gēi-LESS (IVE)

In gēi-LESS, NP1 lets, gives permission, allows, or does not prevent NP2 from carrying out the action (Wong 2009), as in (4).
Some researchers also label gēi’s lessive usage as “permissive”. Newman (1993) pointed out that the sense of gēi permission ranges from a “strong permission” (A explicitly authorizes B to do something) to a “weak permission” (A does not do anything to prevent B from doing something). Both of these senses usually involve an animate entity capable of volition as the permission giver (Newman 1993, also see Thepkanjana & Uehara 2008).

In gēi-LESS, gēi indicates indirect or weak causation. That is to say, different from direct causation, NP1 causes an event to happen by doing something to prompt NP2 to act, or by not doing anything to prevent NP2 from carrying out the action. It is NP2 that directly carries out an action (Yap & Iwasaki 1998). NP1 is henceforth referred to as the “lesser” and NP2 as the “lessee”.
2.2.3 Ambiguity between gěi-BEN interpretation and gěi-LESS interpretation

As discussed above, the benefactive-marked gěi appears in the same position in the sentence as the lessive-marked gěi in Mandarin Chinese, which results in the potential for ambiguity. One sentence with the surface word order of [NP1 + gěi + NP2 + Verb + NP3], especially when NP1 and NP2 are both animate (often human), can be interpreted as either benefactive or lessive. Since there is no overt cue from morphology or word order to signal the grammatical relations, without any pragmatic or contextually-inferred information, both readings are plausible, as showed in (5).

(5) 张三给李四摘苹果。
Zhāng Sān  gěi  Lǐ Sì  zhāi  píngguǒ.
Zhangsan  GEI  Lisi  pick apple

a. ‘Zhangsan picked the apples for (for the sake of/intended for) Lisi.’ (benefactive reading)

b. ‘Zhangsan let Lisi pick the apples.’ (lessive reading)

On the face of it, these two readings can be distinguished by who is the doer of the action (i.e., agent) described by the main verb phrase. In the gěi-BEN reading, NP1 (the agent) intentionally conducts the activity for the sake of NP2, whereas in the gěi-LESS reading, NP2 (the lessee) is the agent of the action described by the following verb phrase (Mueanjai & Thepkanjana 2008). This is exemplified in (6a) and (6b):
Some linguists consider the benefactive constituent of preverbal gěi-NP as an adjunct (oblique), which in this case makes gěi a preposition (Her 2006). In the lessive construction, gěi is a verb encoding the meaning, ‘to allow’ (Li & Thompson 1981; Wong 2009). For the deep structure, gěi lessive construction could be configured as VERB-COMPLEMENT CONSTRUCTION: SUBJ GEI [SUBJ VP], in which the verb gěi takes a sentential complement (or small clause) as object (Lord, Yap, & Iwasaki 2002; Yap & Iwasaki 2003). Using the movement test in order to test the constituency, the benefactive gěi-NP has three possible positions as demonstrated by (7a), (7b), and (7c) below; in contrast, in the lessive gěi pattern, only (7c) is possible. This seems to support the above analysis proposed by some linguists.

(7)  a. NP1 + V + gěi + NP2 + NP3

    我送给他一本书。

    Wǒ sòng gěi tā yī běn shū.

    I send GEI him one CL book

    ‘I send him a book.’
b. NP1 + V + NP3 + ｇěi + NP2

我送一本书给他。

Wǒ sòng yī bèn shū ｇěi tā.
I send one CL book GEI him
‘I send him a book.’

c. NP1 + ｇěi + NP2 + V + NP3

我给他送一本书。

Wǒ ｇěi tā sòng yī bèn shū.
I GEI him send one CL book
‘I send him a book.’

However, at a preliminary stage of looking at these two ｇěi patterns, this study only examines two factors: frequency and semantics of the two patterns in the hope of establishing grounds for further research into the structural difference of the two patterns.

2.3 Frequency of ｇěi-BEN and ｇěi-LESS

One conspicuous difference between ｇěi-BEN and ｇěi-LESS is that the incidence of these two ｇěi uses in everyday speech is not equal. Preverbal ｇěi is most frequently used as a benefactive marker (Her 2006; Li & Thompson 1981); it occurs much less often as a lessive marker. With respect to language acquisition, “frequency of a lexical item or class of items in the input language and the likelihood of its appearance in the child’s vocabulary must be one of the most straightforward and obvious input effects to examine” (Tardif 1996: 500). In order to
examine whether the frequency of \textit{gěi} in the input is responsible for the developmental sequence of \textit{gěi}-BEN and \textit{gěi}-LESS, I first turn to the literature examining the distributional features of \textit{gěi} patterns in adult corpora. Then I investigate the frequency of these two \textit{gěi} patterns in a child-directed speech corpus: the Tardif corpus (1993) in the CHILDES database (MacWhinney 2000).

2.3.1 \textit{Gěi} in adult corpora

M. L.-Y. Wong ’s (2009) study of \textit{gěi} patterns in adults’ corpora labels the lessive use of \textit{gěi} as a marginal function. Wong’s study includes both a spoken corpus (the Call Home Mandarin Chinese Transcripts Corpus) (Wheatley 1996), and a written corpus (the Lancaster Corpus of Mandarin Chinese, i.e., LCMC) (McEnery, Xiao, & Mo 2003). Wong does not give the exact frequency of the lessive \textit{gěi}, since her study is not specifically focused on the comparison between \textit{gěi}-BEN and \textit{gěi}-LESS; she does mention, however, that \textit{gěi}-LESS patterns are even less frequent than \textit{gěi} passives, the latter making up about 4\% of the 1,273 \textit{gěi} patterns found in the LCMC. On the basis of these results, we can infer that \textit{gěi}-BEN occurs much more frequently than \textit{gěi}-LESS in adults’ speech corpora. Examples (8) and (9) are the only two \textit{gěi}-LESS tokens in Wong’s study (2009: 70).

(8) 你们不要催, 再给我吸一支烟。
\begin{verbatim}
Nǐ men bù yào cuī, zài gěi wǒ xī yī zhī yān.
\end{verbatim}
\begin{tabular}{c}
You guys not push again GEI me breathe one CL cigarette \\
‘Don’t push me. Allow me to have another cigarette.’
\end{tabular}

(9) 范松林跑来求李成福给他看块好地。
\begin{verbatim}
Fàn Sōnglín pāo lái qiú Lǐ Chéngfú gěi tā kàn kuài hǎo dì.
\end{verbatim}
\begin{tabular}{c}
Fan Songlin run-come beg Li Chengfu GEI him see CL good land \\
‘Fan Songlin came to Li Chengfu to beg for a look at the piece of fertile land.’
\end{tabular}
2.3.2 *Gēi* in child-directed speech

Now I turn to the child-directed speech data. The child-directed speech corpus used in the present study is the Tardif corpus (Tardif 1993) in the Child Language Data Exchange System (CHILDES) database (MacWhinney 2000). This corpus contains 50 transcripts from Tardif’s longitudinal study of naturalistic mother (caregivers)-infant interaction. The data were collected from 10 families in Beijing from August 1991 to January 1992. There were 10 target children (8 boys and 2 girls), ranging in age from 1;9.3 to 2;2.7, and the mean age was 21 months. All of the children and their parents were native speakers of Mandarin, most also Beijing natives. Tardif’s (1993) study originally focused on children’s language development, in particular, Mandarin-speaking children’s early vocabulary. Tardif’s study also aimed to look at the effect of the adult speech on children’s language learning.

Table 2.1 and Graph 2.1 summarize the frequency of *gēi* patterns in the 50 files in the Tardif corpus (1993). The summaries include only data pertinent to the present study, that is, *gēi* used as a single occurring verb (meaning ‘give’, ‘transfer’), as a benefactive marker, and a lessive marker. For examples of the various preverbal *gēi* patterns found in the Tardif corpus (1993), see Appendix I.

There are two major criteria for identifying the *gēi* patterns:

(1) the preceding and following context, especially based on who is the doer of the action (i.e., agent) described by the main verb phrase (see Chapter 1).

---

2 This corpus is based on Beijing dialect, which is not significantly different from the dialect spoken by the participants in my study, at least with respect to *gēi.*

3 The single occurring verb *gēi* being calculated is mainly relevant to the Semantic Extension Hypothesis discussed in Chapter 3 (see Chapter 3 for details).
(2) referring to the instances of 㷍 patterns cited in other studies (e.g., Wong 2004; Wong 2009)

Table 2.1

*The frequency of 㷍 patterns: single occurring verb, benefactive, and lessive in the Tardif corpus (1993)*

<table>
<thead>
<tr>
<th>Files</th>
<th>Single verb</th>
<th>Benefactive</th>
<th>Lessive</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>bb1.cha</td>
<td>20% (12/60)</td>
<td>35% (21/60)</td>
<td>12% (7/60)</td>
</tr>
<tr>
<td>2</td>
<td>bb2.cha</td>
<td>30% (23/76)</td>
<td>32% (24/76)</td>
<td>14% (11/76)</td>
</tr>
<tr>
<td>3</td>
<td>bb3.cha</td>
<td>24% (19/80)</td>
<td>25% (20/80)</td>
<td>20% (16/80)</td>
</tr>
<tr>
<td>4</td>
<td>bb4.cha</td>
<td>14% (6/43)</td>
<td>47% (20/43)</td>
<td>9% (4/43)</td>
</tr>
<tr>
<td>5</td>
<td>bb5.cha</td>
<td>26% (16/62)</td>
<td>44% (27/62)</td>
<td>8% (5/62)</td>
</tr>
<tr>
<td>6</td>
<td>cx1.cha</td>
<td>51% (18/35)</td>
<td>31% (11/35)</td>
<td>3% (1/35)</td>
</tr>
<tr>
<td>7</td>
<td>cx2.cha</td>
<td>43% (21/49)</td>
<td>16% (8/49)</td>
<td>6% (3/49)</td>
</tr>
<tr>
<td>8</td>
<td>cx3.cha</td>
<td>13% (9/71)</td>
<td>55% (39/71)</td>
<td>6% (4/71)</td>
</tr>
<tr>
<td>9</td>
<td>cx4.cha</td>
<td>39% (58/148)</td>
<td>32% (48/148)</td>
<td>5% (8/148)</td>
</tr>
<tr>
<td>10</td>
<td>cx5.cha</td>
<td>7% (3/41)</td>
<td>37% (15/41)</td>
<td>15% (6/41)</td>
</tr>
<tr>
<td>11</td>
<td>hy1.cha</td>
<td>24% (12/51)</td>
<td>59% (30/51)</td>
<td>8% (4/51)</td>
</tr>
<tr>
<td>12</td>
<td>hy2.cha</td>
<td>24% (9/38)</td>
<td>34% (13/38)</td>
<td>21% (8/38)</td>
</tr>
<tr>
<td>13</td>
<td>hy3.cha</td>
<td>29% (6/21)</td>
<td>48% (10/21)</td>
<td>0% (0/21)</td>
</tr>
<tr>
<td>14</td>
<td>hy4.cha</td>
<td>31% (8/26)</td>
<td>38% (10/26)</td>
<td>0% (0/26)</td>
</tr>
<tr>
<td>15</td>
<td>hy6.cha</td>
<td>36% (10/28)</td>
<td>32% (9/28)</td>
<td>4% (1/28)</td>
</tr>
<tr>
<td>16</td>
<td>lc1.cha</td>
<td>28% (17/60)</td>
<td>40% (24/60)</td>
<td>8% (5/60)</td>
</tr>
<tr>
<td>17</td>
<td>lc2.cha</td>
<td>72% (13/18)</td>
<td>6% (1/18)</td>
<td>11% (2/18)</td>
</tr>
<tr>
<td>18</td>
<td>lc3.cha</td>
<td>41% (11/27)</td>
<td>26% (7/27)</td>
<td>4% (1/27)</td>
</tr>
<tr>
<td>19</td>
<td>lc4.cha</td>
<td>28% (5/18)</td>
<td>33% (6/18)</td>
<td>0% (0/18)</td>
</tr>
<tr>
<td>20</td>
<td>lc5.cha</td>
<td>18% (8/45)</td>
<td>44% (20/45)</td>
<td>2% (1/45)</td>
</tr>
<tr>
<td>21</td>
<td>ll1.cha</td>
<td>36% (27/76)</td>
<td>32% (24/76)</td>
<td>9% (7/76)</td>
</tr>
<tr>
<td>22</td>
<td>ll3.cha</td>
<td>37% (18/49)</td>
<td>24% (12/49)</td>
<td>6% (3/49)</td>
</tr>
<tr>
<td>23</td>
<td>ll4.cha</td>
<td>23% (18/77)</td>
<td>26% (20/77)</td>
<td>16% (12/77)</td>
</tr>
<tr>
<td>24</td>
<td>ll5.cha</td>
<td>25% (22/88)</td>
<td>36% (32/88)</td>
<td>10% (9/88)</td>
</tr>
<tr>
<td>25</td>
<td>lxb1.cha</td>
<td>42% (10/24)</td>
<td>29% (7/24)</td>
<td>8% (2/24)</td>
</tr>
<tr>
<td>26</td>
<td>lxb2.cha</td>
<td>0% (0/3)</td>
<td>33% (1/3)</td>
<td>67% (2/3)</td>
</tr>
<tr>
<td>27</td>
<td>lxb3.cha</td>
<td>22% (8/36)</td>
<td>39% (14/36)</td>
<td>0% (0/36)</td>
</tr>
<tr>
<td>28</td>
<td>lxb4.cha</td>
<td>28% (5/18)</td>
<td>28% (5/18)</td>
<td>0% (0/18)</td>
</tr>
<tr>
<td>29</td>
<td>lxb6.cha</td>
<td>32% (7/22)</td>
<td>23% (5/22)</td>
<td>5% (1/22)</td>
</tr>
<tr>
<td>30</td>
<td>lxb23.cha</td>
<td>37% (16/43)</td>
<td>26% (11/43)</td>
<td>0% (0/43)</td>
</tr>
<tr>
<td>31</td>
<td>tt1.cha</td>
<td>34% (13/38)</td>
<td>34% (13/38)</td>
<td>5% (2/38)</td>
</tr>
<tr>
<td>File</td>
<td>Pattern</td>
<td>Single Occurring Verb</td>
<td>Benefactive</td>
<td>Lessive</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------</td>
<td>-----------------------</td>
<td>-------------</td>
<td>---------</td>
</tr>
<tr>
<td>32</td>
<td>tt2.cha</td>
<td>47% (17/36)</td>
<td>31% (11/36)</td>
<td>0% (0/36)</td>
</tr>
<tr>
<td>33</td>
<td>tt3.cha</td>
<td>14% (3/21)</td>
<td>29% (6/21)</td>
<td>0% (0/21)</td>
</tr>
<tr>
<td>34</td>
<td>tt4.cha</td>
<td>45% (13/29)</td>
<td>24% (7/29)</td>
<td>14% (4/29)</td>
</tr>
<tr>
<td>35</td>
<td>tt5.cha</td>
<td>30% (15/50)</td>
<td>20% (10/50)</td>
<td>20% (10/50)</td>
</tr>
<tr>
<td>36</td>
<td>ww1.cha</td>
<td>37% (16/43)</td>
<td>19% (8/43)</td>
<td>2% (1/43)</td>
</tr>
<tr>
<td>37</td>
<td>ww2.cha</td>
<td>20% (16/80)</td>
<td>44% (35/80)</td>
<td>5% (4/80)</td>
</tr>
<tr>
<td>38</td>
<td>ww3.cha</td>
<td>17% (4/23)</td>
<td>43% (10/23)</td>
<td>13% (3/23)</td>
</tr>
<tr>
<td>39</td>
<td>ww4.cha</td>
<td>11% (4/37)</td>
<td>41% (15/37)</td>
<td>14% (5/37)</td>
</tr>
<tr>
<td>40</td>
<td>ww6.cha</td>
<td>27% (35/131)</td>
<td>34% (44/131)</td>
<td>8% (11/131)</td>
</tr>
<tr>
<td>41</td>
<td>wx1.cha</td>
<td>44% (8/18)</td>
<td>6% (1/18)</td>
<td>6% (1/18)</td>
</tr>
<tr>
<td>42</td>
<td>wx2.cha</td>
<td>30% (7/23)</td>
<td>35% (8/23)</td>
<td>17% (4/23)</td>
</tr>
<tr>
<td>43</td>
<td>wx3.cha</td>
<td>10% (5/48)</td>
<td>63% (30/48)</td>
<td>10% (5/48)</td>
</tr>
<tr>
<td>44</td>
<td>wx4.cha</td>
<td>9% (4/44)</td>
<td>55% (24/44)</td>
<td>0% (0/44)</td>
</tr>
<tr>
<td>45</td>
<td>wx5.cha</td>
<td>2% (1/46)</td>
<td>67% (31/46)</td>
<td>9% (4/46)</td>
</tr>
<tr>
<td>46</td>
<td>yy1.cha</td>
<td>4% (1/26)</td>
<td>65% (17/26)</td>
<td>8% (2/26)</td>
</tr>
<tr>
<td>47</td>
<td>yy2.cha</td>
<td>37% (15/41)</td>
<td>15% (6/41)</td>
<td>27% (11/41)</td>
</tr>
<tr>
<td>48</td>
<td>yy3.cha</td>
<td>24% (6/25)</td>
<td>56% (14/25)</td>
<td>8% (2/25)</td>
</tr>
<tr>
<td>49</td>
<td>yy4.cha</td>
<td>16% (5/32)</td>
<td>53% (17/32)</td>
<td>22% (7/32)</td>
</tr>
<tr>
<td>50</td>
<td>yy6.cha</td>
<td>27% (18/67)</td>
<td>25% (17/67)</td>
<td>9% (6/67)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2291</strong></td>
<td><strong>621 (27%)</strong></td>
<td><strong>818 (35%)</strong></td>
<td><strong>205 (9%)</strong></td>
</tr>
</tbody>
</table>

Sample size: 50 files, 113,821 lines in total
Total of the identifiable tokens of *gêi*: 2,291
Children’s age range: 1;9.3 to 2;2.7

**Graph 2.1** Pie graph of the frequency of *gêi* patterns: single occurring verb, benefactive, lessive, and others in the Tardif corpus (1993)
A Paired T-test reveals that there is a statistically significant difference between the frequencies of ḍē-BEN and ḍē-LESS, \( t(49) = 10.11, p < .001 \), between the frequencies of verb and ḍē-BEN, \( t(49) = -2.25, p = .03 \), and between the frequencies of verb and ḍē-LESS, \( t(49) = 6.39, p < .001 \). Crucially, the frequencies in the Tardif corpus (1993) demonstrate that the frequency of ḍē-BEN (M = .35) is statistically greater than that of ḍē-LESS (M = .09) (see Table 2.2 and Table 2.3).

**Table 2.2**

*Mean and standard deviation of ḍē patterns in the Tardif corpus (1993)*

<table>
<thead>
<tr>
<th>Statistics : Mean (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
</tr>
<tr>
<td>50</td>
</tr>
</tbody>
</table>

**Table 2.3**

*Paired T-test statistics between ḍē patterns in the Tardif corpus (1993)*

<table>
<thead>
<tr>
<th>a. ḍē-BEN</th>
<th>b. ḍē-LESS</th>
<th>c. verb</th>
</tr>
</thead>
<tbody>
<tr>
<td>( T )</td>
<td>( p )-value</td>
<td>( T )</td>
</tr>
<tr>
<td>a. ḍē-BEN</td>
<td>10.11</td>
<td>.00***</td>
</tr>
<tr>
<td>b. ḍē-LESS</td>
<td>6.39</td>
<td>.00***</td>
</tr>
<tr>
<td>c. verb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In conclusion, the results of my corpus analysis of the frequency difference between ḍē-BEN and ḍē-LESS in the Tardif corpus (1993) confirm the results in Wong (2009), although the difference in my corpus analysis is slightly smaller than that of Wong’s. However, it is not
the case (as suggested by Wong) that blockquote; gěi-LESS is very rare in the input—almost 1/10 instances of  
gěi sentences were gěi-LESS.

2.4 Adults’ preference for the  gěi-BEN reading

Previous research also shows that between gěi-BEN and gěi-LESS, adult native speakers  
of Mandarin have a strong preference for understanding  gěi in a benefactive manner. Yap &  
Iwasaki (1998; also see Thepkanjana & Uehara 2008) pointed out that to avoid the ambiguity  
between these two gěi patterns, native speakers of Mandarin Chinese tend to opt for the  ràng  
‘let’ and jiào ‘let, ask’ over gěi in uttering a lessive/permissive sentence (Thepkanjana & Uehara  
2008). They claimed that native speakers of Chinese tend to interpret gěi, as in (10) below, as the  
benefactive marker rather than the lessive marker.

(10)  他给我造了一座房子。  (Thepkanjana & Uehara 2008: 632)  
  Tā gěi wǒ zào le yī zuò fāngzi.  
  He GEI me build PFV one CL house  
  a. ‘He built a house for me.’  
  b. ‘He had me build a house.’

However, instances of  gěi-LESS are found in both adults’ natural speech and written data. When  
context is clear,  gěi-LESS does not sound awkward, as exemplified by the instances cited earlier  
from Wong (2009) (see p. 13). There are also  gěi-LESS instances in the Tardif corpus (1993). So  
Yap & Iwasaki’s comments need to be qualified with the recognition that native Mandarin-  
speaking adults have a strong preference for interpreting preverbal gěi in a benefactive manner,  
which is demonstrated by the very few  gěi lessive instances in Wong’s (2009) adult corpus data.
In sum, gěi-BEN and gěi-LESS follow the same word order and thus create the potential for ambiguity. In addition, the frequency of gěi-BEN is significantly higher than gěi-LESS both in adult corpora and in a child-directed speech corpus. This raises the research questions: (1) At what age or developmental stage does knowledge of gěi-BEN and gěi-LESS become accessible to children? (2) What factor(s) predict the order of acquisition of these two patterns? I turn now to two hypotheses which can be employed to predict answers to these questions.
CHAPTER 3
HYPOTHESES AND PREDICTIONS

This chapter introduces two hypotheses that make different predictions about the acquisition of gêî-BEN and gêî-LESS. I first discuss the Frequency Effect Hypothesis (FEH), followed by the Semantic Extension Hypothesis (SEH).

3.1 Frequency Effect Hypothesis (FEH)

3.1.1 FEH and the evidence

Many studies have claimed that adult language processing is sensitive to frequency effects (e.g., Bod, Hay, & Jannedy 2003; Bybee & Hopper 2001). For example, Gennari & MacDonald said “One of the truisms of adult language comprehension is that the frequency of elements in the input is a big player” (2006: 129). In a similar vein, input frequency plays a big role in language acquisition sequences and various levels of language, including the lexical, syntactic, and discourse comprehension and production (Lieven 2010), as well as “emergence of linguistic categories and rules” (Diessel 2007: 109).

A substantial number of naturalistic and experimental studies have found evidence that frequency in the input is positively related to both word learning and syntax learning. For instance, Naigles & Hoff-Ginsberg (1998) investigated the extent to which aspects of the input language (i.e., adult verb use) accounted for children’s acquisition sequence of verbs. The authors claimed that the frequency with which verbs appeared in the input significantly dictates child verb use. “Go may be acquired early because it appears frequently in children’s input” (1998: 116). They found that “the more often a verb appeared in the input, the more often and more flexibly it was used in the child speech corpus 10 weeks later” (1998: 116).
Cross-linguistic research concerning the acquisition sequence between noun class and verb class also attributes frequency as one factor. A number of studies (e.g., Dromi 1987; Goldfield 1993) found an early noun bias for child learners of English, Hebrew, and Italian. In contrast, other studies found early verb acquisition (or at least no later than the noun acquisition) for learners of Mandarin Chinese and Korean (e.g., Choi & Gopnik 1995; Tardif 1996). The explanation given by these researchers was that verb types are more frequent than noun types in adult-to-child speech in Mandarin Chinese and Korean as compared to English, Hebrew, and Italian.

Another example is child acquisition of passives. Demuth, Moloi, & Machobane (2010) summarized that studies “reporting early acquisition of passives also report the high frequency of passives in the input,” (Demuth et al. 2010: 239) whereas studies reporting late acquisition of passives (e.g., English, German, and Hebrew) have fewer passives in the input. “This suggests that more exposure to the passive might facilitate earlier comprehension and use of this construction in languages where it is typically acquired late” (Demuth et al. 2010: 239).

To the extent that these findings are valid, they indicate that the age at which passives are acquired and the frequency of the passive utterances in the input, are correlated across languages. In other words, when passives are more frequent in the input to children, children often produce passives earlier than child learners of the language in which the passives are less frequent, e.g., English. Child acquisition of passives demonstrates that not only can the input facilitate morphological learning but also syntactic learning (Ambridge & Lieven 2011; Demuth et al. 2010).
Thus in these studies, frequency is thought to be a major factor in language acquisition. If so, we would expect that frequency also contributes to child acquisition of gēi-BEN and gēi-LESS, as expounded below.

### 3.1.2 Prediction following FEH

Given evidence for the FEH, if there is a considerable frequency difference between gēi-BEN and gēi-LESS in the input, we would expect children to acquire the gēi pattern occurring more frequently before the less frequent pattern.\(^4\) The corpus analysis shows that gēi-BEN occurs statistically more frequently than gēi-LESS in both adult and child-directed speech corpora (see Chapter 2). It follows, then, on the FEH account, that gēi-BEN should be acquired earlier than gēi-LESS.

Prediction of the FEH: Gēi-BEN should be acquired before gēi-LESS

### 3.2 Semantic Extension Hypothesis (SEH)

#### 3.2.1 SEH and its main postulations

Cognitive grammar proposes that different meanings of a polysemous morpheme are linked through the process of semantic relatedness or semantic extension. In this case, the prototype is the core meaning. The subordinate meanings are derived hierarchically from the core meaning, and thus form a meaning chain (cf. Lakoff 1987; Langacker 1990; Taylor 1989).

\(^4\) This prediction is following the simplistic version of the FEH despite the modification of the frequency effect in recent studies. Dr. William O'Grady suggests a weaker version of the FEH which states that the less frequent structure will be acquired no earlier than the more frequent structure.
Newman (1993) examined various Mandarin gěi patterns. He proposed an explanation for the semantic relatedness of the multiple meanings of gěi. From Newman’s perspective, the various uses of gěi are all derived from the basic frame: someone-gives-something-to-someone, i.e., “the spatio-temporal domain in which a person hands a thing to another person” (Newman 1993: 438). This basic frame lays the ground for the benefactive usage of gěi, since giving something often confers some kind of benefit to the recipient, which naturally and frequently occurs in human experience (Newman 1993). On the other hand, “in most cases, however, there is at least a weak implication that the BENEFACITIVE is also a RECIPIENT.” (Newman 1993: 460). As for the lessive (which he calls “permissive”) sense of gěi, Newman viewed it as the instance of a more general notion of transfer of control. He suggested that “in the domain of interpersonal power relationships” the permissive sense of gěi “manifests itself as the granting of permission to someone to perform an act” (Newman 1993: 470).

In sum, from Newman’s perspective, the various gěi usages are not just coincident: They are all related in that they extend from the verbal sense of gěi (to give).

One study that adopts the semantic extension approach and is directly relevant to the present study is K.-S.Wong’s (2004) study of the developmental sequence of bei2, the Cantonese counterpart of Mandarin gěi. His study focused on four bei2 patterns: transfer, permissive, dative, and passive. Despite Wong’s different labels, on the basis of his examples for each pattern, the four bei2 patterns in Wong’s study are, respectively, comparable to the full lexical verb gěi pattern, the gěi-LESS, the gěi-BEN, and the gěi-passive as defined in the present study, although gěi-passive is not a focus of the present study.
Wong postulated that transfer, lessive, and benefactive uses share the same basic lexical semantics; that is, they all have the core meaning of ‘transfer’. The verbal bei2 means ‘to give’—a transfer activity. Lessive bei2 denotes the “purpose of the transfer” (Wong 2004: 326) and “can be analyzed as a combination of the transfer construction and a verb to denote the special caused activity” (Wong 2004: 333). From Wong’s perspective, the lessive sentence ‘Teacher let (bei2) me eat apples’ can be conceived as ‘Teacher gave me (apples)’ (transfer) + ‘I eat apples’ (activity). Thus Wong considered the concept of lessive as “a natural extension of the concept of ‘giving’: one gives something to a party in order to allow something to happen” (Wong 2004: 332). The benefactive use of bei2 incorporates the notion of ‘transfer’ by denoting “the particular transfer act” (Wong 2004: 326), which is specified by the particular type of transfer activity involving ‘give’ through the meaning of sending, bringing, etc. Finally, according to Wong’s study, the passive use of bei2 is the most distant to the core meaning of ‘transfer’.

Wong proposed that the developmental sequence corresponds closely to the syntactic complexity of the constructions and their semantic distance to the core meaning of ‘transfer’. That is, “constructions that are relatively less complex and resemble the transfer construction more tend to be acquired earlier (and be more frequent) than other constructions” (Wong 2004: 339). Wong accordingly hypothesized that “the dative and the permissive constructions should come after the transfer construction because structurally, both require an extra verb to give extra information ... that is, the dative and permissive constructions are structurally more complex and semantically more specific than transfer.” (Wong 2004: 334). 5

Wong tested this prediction with the results of a corpus study from the CANCORP database. CANCORP is a corpus of Cantonese adult-child speech; the original one can be found

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5 In Wong’s (2004) study, the syntactic complexity, with respect to the transfer (full lexical verb) pattern, the lessive pattern, and the benefactive pattern, mainly refers to the surface word order of bei2 patterns, e.g., the number of verbs involved in a certain pattern.
in the CHILDES database (MacWhinney 2000). The sample size of Wong’s study is 128 files, representing 8 Cantonese-speaking children, aged between 22 and 42 months, who were divided into a younger group and an older group based on their first recordings. Wong’s main findings are summarized in Table 3.1.

**Table 3.1**

*The mean frequency of different bei2 patterns and the average age of emergence in Wong’s study (adapted from Wong 2004: 336-338)*

<table>
<thead>
<tr>
<th></th>
<th>Transfer</th>
<th>Lessive</th>
<th>Benefactive</th>
<th>Passive</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Younger child group</strong> (n=4) (1;10.30-2;05.23)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of bei2</td>
<td>62.25 (69%)</td>
<td>10.75 (12%)</td>
<td>9.75 (11%)</td>
<td>1.25 (1%)</td>
<td>90</td>
</tr>
<tr>
<td>Average age of Emergence</td>
<td>2;00.24</td>
<td>2;02.29</td>
<td>2;03.14</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td><strong>Older child group</strong> (n=4) (2;02.10-3;04.22)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency of bei2</td>
<td>41.25 (39%)</td>
<td>31.5 (31%)</td>
<td>19 (19%)</td>
<td>1.75 (2%)</td>
<td>102.25</td>
</tr>
<tr>
<td>Average age of Emergence</td>
<td>2;05.22</td>
<td>2;07.25</td>
<td>2;07.15</td>
<td>3;00.11</td>
<td></td>
</tr>
</tbody>
</table>

Wong claimed that his basic findings confirmed his hypothesis, because his corpus study showed the acquisition sequence of transfer (full lexical verb)>lessive>benefactive>passive (”>” signifies “before”) among the younger children. This is mainly based on two criteria: (1) the mean frequency of each bei2 pattern, and (2) the average age of emergence among younger children, which is calculated by adding up the age at which a particular bei2 pattern occurred first time for each child then dividing it by the total number of the younger children (see Table 3.2). Wong pointed out these two criteria are co-related among the younger children in which both measures indicate the sequence of transfer>lessive>benefactive>passive.
Table 3.2

The age of emergence of bei2-lessive and bei2-benefactive for each child and the average age of emergence of the two patterns in Wong’s study (adapted from Wong 2004: 338)

<table>
<thead>
<tr>
<th>younger children</th>
<th>bei2-lessive</th>
<th>bei2-benefactive</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC</td>
<td>2;04.10</td>
<td>2;05.23</td>
</tr>
<tr>
<td>CGK</td>
<td>1;11.29</td>
<td>2;00.08</td>
</tr>
<tr>
<td>CKT</td>
<td>2;03.17</td>
<td>2;03.17</td>
</tr>
<tr>
<td>MHZ</td>
<td>2;03.28</td>
<td>2;04.07</td>
</tr>
<tr>
<td>Average</td>
<td>2;02.29</td>
<td>2;03.14</td>
</tr>
</tbody>
</table>

Wong particularly pointed out the observation from the corpus data “that the permissive construction is acquired slightly earlier than the dative construction. This suggests that the lexical function of bei2 (‘to let’) might have an advantage over its grammatical function (recipient-marking)” (p. 339).

It needs to point out that the bei2 benefactive and the bei2 lessive are not Wong’s particular concern, and his study is actually about the grammaticalization course of various bei2 constructions. However, to take Wong’s speculation of the semantics of bei2 patterns one step further, especially his production corpus data, a coherent and explicit statement of the prediction of the SEH would be that the gěi lessive is acquired earlier than the gěi benefactive. But this prediction still has some weakness: First, whether the gěi meaning network is actually mentally present is hard to test; Second, the semantic relation between the lessive gěi and the benefactive gěi and especially which one is closer (i.e., cognitively accessible) to the verbal meaning is inconclusive, although Wong seemed to indicate that the lessive gěi is closer to the verbal meaning. These two points will be further justified in the discussion chapter. Despite the
vagueness of the SEH, Wong’s claim of the acquisition sequence based the corpus data is still testable.  

3.2.2 Prediction following SEH

SEH posits that the emergence of various gěi patterns are all derived from the core meaning of ‘give’, and semantic extension plays an important role in developmental sequence. Wong’s findings from the corpus data generally suggest that gěi-LESS is acquired slightly earlier than the gěi-BEN. On the assumption that Mandarin-speaking children do not cognitively differ from Cantonese-speaking children in extending the literal meaning of gěi, then we would expect the acquisition sequence of the Mandarin gěi-BEN and gěi-LESS to parallel the sequence found in Cantonese, i.e., the lessive acquired earlier than the benefactive when everything is equal.  

Prediction of the SEH: Gěi-LESS should be acquired before gěi-BEN

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6 In personal communication, Wong responded to my question concerning an explicit prediction regarding the acquisition sequence between the gěi benefactive and the gěi lessive patterns. He replied that “I would have thought that the permissive bei2 would emerge first: apart from the fact that it is a lexical verb rather than a grammatical marker, in speech addressed to young children, the permissive bei2 can occur on its own without the need to have a following verb.

bei2! (allowed)

mbei2! (not allowed)

As for the dative bei2, it does not seem to be so free-standing ...”

7 In Cantonese, the dative pattern has the canonical structure of “agent-Verb-theme-bei2-recipient” (Wong 2004: 331), which is also allowed in Mandarin even if it is not the canonical one. Instances of the bei2-LESS in Wong’s study are structurally the same as the corresponding Mandarin gěi-LESS. Since the frequency and semantics are the main concerns of the present study, the detailed structural difference between Cantonese bei2-BEN and Mandarin gěi-BEN is not addressed in this study although it is very important.
In summary, FEH and SEH make different predictions regarding the acquisition sequence of the Mandarin ɻĕi-BEN and ɻĕi-LESS. FEH predicts that ɻĕi-BEN is acquired before ɻĕi-LESS. But SEH predicts ɻĕi-LESS is acquired before ɻĕi-BEN. These two hypotheses and the different predictions discussed here are summarized in Table 3.3.

Table 3.3
*FEH and SEH and their predictions of the acquisition sequence*

<table>
<thead>
<tr>
<th>Hypotheses</th>
<th>Acquisition sequence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency Effect Hypothesis (FEH)</td>
<td>ɻĕi-BEN &gt; ɻĕi-LESS</td>
</tr>
<tr>
<td>Semantic Extension Hypothesis (SEH)</td>
<td>ɻĕi-LESS &lt; ɻĕi-BEN</td>
</tr>
</tbody>
</table>
CHAPTER 4
THE PRESENT STUDY

This chapter reports an experimental study of Mandarin-speaking child comprehension of  
gēi-BEN and gēi-LESS. I conducted the experiment in Shijiazhuang (石家庄), Hebei province,  
China from May 27, 2010 to June 21, 2010. Shijiazhuang is the capital city of Hebei province,  
about 200 kilometers southwest of Beijing. Shijiazhuang belongs to the Ji-Lu Mandarin-speaking  
area, which straddles Hebei province (Ji) and western Shandong province (Lu). The purpose of  
the experiment was to investigate at what age knowledge of gēi-BEN and gēi-LESS become  
accessible to children, and whether there is any temporal sequence in the acquisition of these two  
patterns.

4.1 Task and materials

4.1.1 Modified Truth Value Judgment Task (TVJT)

A Truth Value Judgment Task (TVJT) (Crain & Thornton 1998) was employed, modified  
as described below. In this task, children listened to short stories in Chinese with accompanying  
pictures. The stories were either Lessive-type stories (in which the lessive reading was true) or  
Benefactive-type stories (in which the benefactive reading was true). At the end of each story,  
the experimenter asked a who-question which contained gēi in the critical items. Then a puppet  

lion said an answer to the experimenter’s question. The child indicated whether the puppet said  

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8 This research passed the expedited review and received approval from the institutional review of the Committee on  
Human Studies at the University of Hawai‘i at Mānoa. The IRB registration number is CHS #17755.
the right thing or not by pasting a “happy face” sticker or a “sad face” sticker for each story on an answer sheet. Sample protocols, including contexts, and test items, are presented below in Section 4.1.8.

4.1.2 Critical test items

There were 6 critical test items divided into 2 scenario types: the lessive-matched scenario and the benefactive-matched scenario. There were 3 tokens for each type. If the child accessed the lessive reading, I expected the child to say ‘True’ to the lessive-matched test items. If the child accessed the benefactive reading, I expected the child to say ‘True’ to the benefactive-matched test items. If the child accessed both the lessive reading and the benefactive reading, I expected the child to say ‘True’ to all critical test items (for detailed explanation, see the discussion of the logic following each critical test item sample).

4.1.3 Control items

Because answers to all critical test items were expected to be ‘True’, control items were required to rule out the possibility that children were using a yes-strategy across the board, i.e., a yes-bias, or the Principle of Charity (Crain & Thornton 1998). There were 2 control items, one each for the lessive-matched scenario and the benefactive-matched scenario. I only gave the mismatched answer to the control items, to which I expected the child to say ‘False’ (for detailed explanation, see the discussion of the logic following the control item sample).

The transitive verbs in Mandarin used in the test sentences of the critical test items and control items are summarized in Table 4.1.
Table 4.1

Transitive verbs used in the test sentences of the critical test items and control items

<table>
<thead>
<tr>
<th>Lessive-matched scenario</th>
<th>Benefactive-matched scenario</th>
</tr>
</thead>
<tbody>
<tr>
<td>huà 画 ‘draw’</td>
<td>dào 倒 ‘dump’</td>
</tr>
<tr>
<td>diǎn 点 ‘light’</td>
<td>duī 堆 ‘build’</td>
</tr>
<tr>
<td>fàng 放 ‘set’</td>
<td>jiān 捡 ‘pick up’</td>
</tr>
<tr>
<td>chuī 吹 ‘blow’</td>
<td>jiā 夹 ‘take’</td>
</tr>
</tbody>
</table>

4.1.4 Filler items

There were 8 filler items involving frequently used transitive verbs. All of the filler items matched the critical test items in length and story-style. Six of the 8 filler items were intended to be False-answers in order to balance between target True-answers and target False-answers.

4.1.5 Training items

There was a training session using 2 training items before the experiment started. In the first item, the puppet lion said the right thing, and in the second item, the puppet lion did not say the right thing. The training items did not count as test items.

4.1.6 Presentation of the experimental items

After the 2 training items, there were a total of 16 test items presented to each child: 6 critical test items, 2 controls, and 8 fillers. Each training item and test item, along with the
enlarged accompanying color pictures, were printed and bound together into a single booklet that looked like a child’s picture book.

4.1.7 Order of the test items

I used two sets of semi-randomized orders of the test items to test the participants. Table 4.2 presents the participants included in the final analyses and the order of the test items applied. Since there was no order effect shown, I combined the results from the two orders, and henceforth present all data in aggregated form.

Table 4.2
Participants included in the final analyses and the order of the test items applied

<table>
<thead>
<tr>
<th></th>
<th>Total Number</th>
<th>Numbers in order 1</th>
<th>Numbers in order 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children</td>
<td>56</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>Adolescents</td>
<td>9</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Adults</td>
<td>74</td>
<td>44</td>
<td>30</td>
</tr>
</tbody>
</table>

4.1.8 Test item samples

Below are the Mandarin and English versions of two critical test item samples, respectively for the lessive-matched items and the benefactive-matched items, one control item sample for the benefactive-matched scenario, and one filler sample. After each critical test item and control item sample is a discussion of the logic of that item (for the Mandarin and English versions of all the critical and control items, see Appendix II; for all the filler items, and the training items, see Appendix III).
(1) Test item sample of the lessive-matched items

1. 鸭子得到了一支神奇的魔笔。用它画出来的东西都能变成真的。

Duck got a magic brush. Anything drawn with this brush would become real!

2. 象爸爸和象宝宝来了。象爸爸说：“鸭子啊，我能用你的魔笔画一副翅膀吗？我想飞！”鸭子说：“不行，不行，我可不愿意别人用我的魔笔。”象爸爸又问鸭子：“那你来画怎么样？”

Daddy Elephant and Baby Elephant came by.
**Daddy Elephant:** Hi, Duck! Can I draw a pair of wings with your magic brush? I want to fly!

**Duck:** No way! I don’t want others to use my brush!

**Daddy Elephant:** Well, then how about you drawing me some wings?

3. 鸭子说：“别开玩笑了！你需要一副大翅膀，那得花去我一整天的时间，我可不想画啊！”大象听了很失望。

**Duck:** Are you kidding me? You would need huge wings. I don’t want to spend my whole day on you!

Daddy Elephant was very sad.

4. 象宝宝说：“鸭子啊，我的身体小，你来画我的翅膀怎么样？”鸭子说：“可以是可是，不过现在我得赶去参加一个冰淇淋晚会，顾不上啊。”象宝宝说：“那我来画吧！如果你同意，瞧，我刚好有一个冰淇淋，你拿去吃吧！”

Baby Elephant came up, “Duck, I am much smaller. Could you draw me some wings?”

Duck was about to draw some wings, but he suddenly remembered an important thing.

**Duck:** I could, but now I have to go to an ice cream party.
**Baby Elephant:** Then can I draw some wings? If you agree, look! I just got this chocolate ice cream! It is yours!

5. 鴨子说：“我本来不愿意别人用我的魔笔，所以才没有同意象爸爸；可是既然你这么好，还送我冰淇淋，嗯……好吧……你拿去画吧！”象宝宝接过了笔，开始画起了翅膀。

**Duck:** I don’t really want others to use my brush. That is why I did not want your Daddy to draw wings. But… you are so nice… here you go. You can draw some wings!

Baby Elephant got the brush from the Duck and started drawing the wings.

**Experimenter’s question:**

鸭子给谁画翅膀?

Yāzi gěi shuǐ huá chībǎng?

duck GEI who draw wing

‘For whom did Duck draw wings?’ (benefactive reading)

‘Who did Duck let draw wings?’ (lessive reading)

**Puppet:**

象宝宝 Xiàng bāobao ‘Baby Elephant’ (matched only on the lessive reading)

In this story, Baby Elephant received permission to draw wings from Duck (lessive reading=true), but did not receive the wings drawn by Duck (benefactive reading=false). Daddy Elephant, however, did not receive wings, nor permission to draw wings, and so both the benefactive as well as the lessive readings are false here. So if the child accesses the lessive reading with this story, I expect the child to say ‘True’ only if the puppet says ‘Baby Elephant’. But if the child accesses the benefactive reading only, I expect the child to say ‘False’ to the puppet, no matter what the puppet says.

This test item also satisfies the Condition of Plausible Dissent for the TVJT (Crain & Thornton 1998). Since in this story, both the benefactive reading (conveyed by Baby Elephant’s
request to Duck *Could you draw me some wings?*) and the lessive reading (conveyed by Baby Elephant’s request to Duck *Then can I draw some wings?*) are available during the story. In addition, the benefactive reading is almost possible until Duck remembered that he had to go to an ice cream party and refused to draw any wings. So the benefactive reading is denied and only the lessive reading matches.

**Table 4.3**
*Summary of the expected responses for test item sample of the lessive-matched items*

<table>
<thead>
<tr>
<th>Puppet's statement</th>
<th>Child’s response if s/he accesses benefactive reading</th>
<th>Child's response if s/he accesses lessive reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby Elephant</td>
<td>False</td>
<td>True</td>
</tr>
</tbody>
</table>

(2) **Test item sample of the benefactive-matched items**

1. 老鼠大王偷了一桶牛奶。

   King Rat stole a big carton of milk.

2. 灰老鼠说: “大王呀，您的牛奶我能倒点儿吗?” 老鼠大王刚要同意，可是他想了想说: “不行，我知道你做事总是毛手毛脚，会洒了牛奶的，还是我来倒吧。” 老鼠大王说着往灰老鼠的杯子里倒了一些牛奶。

   **Gray Rat:** Your Majesty, could I pour some milk into my cup?

   King Rat was about to agree, but he remembered that Gray Rat was very clumsy.

   **King Rat:** No, Gray Rat, I don’t want you to spill my milk. You are very clumsy! I will pour it. King Rat filled up Gray Rat’s cup.
3. Blue Rat could not wait, “My turn! Please pour some into my cup too!”

**King Rat:** Hey! I am the KING! I cannot serve all of you guys!

4. Blue Rat: Then, can I pour the milk?

Blue Rat was about to pour the milk, but King Rat suddenly realized that his milk carton was almost empty. “Oh, no, nobody can have my milk!” King Rat said.

**Experimenter’s question:**

老鼠大王给谁倒牛奶？

Lǎoshū dàwáng Gěi shuí dào niúnǎi?

rat king GEI who pour milk

‘For whom did King Rat pour the milk?’

‘Who did King Rat let pour the milk?’ (lessive reading)

**Puppet:**

灰老鼠 Huī lǎoshū ‘Gray Rat’

(matched only on the benefactive reading)

In this story, Gray Rat received the milk from the King (benefactive reading=true), but did not receive permission to pour the milk (lessive reading=false). Blue Rat, however, did not receive the milk, nor permission to pour the milk, and so both the benefactive as well as the lessive readings are false here. So if the child accesses the benefactive reading with this story, I expect the child to say ‘True’ only if the puppet says ‘Gray Rat’. But if the child accesses the lessive reading only, I expect the child to say ‘False’ to the puppet, no matter what the puppet says.
This test item also satisfies the Condition of Plausible Dissent for the TVJT (Crain & Thornton 1998). Since in this story, both the lessive reading (conveyed by Gray Rat’s request to King Rat *Could I pour some milk into my cup?*) and the benefactive reading (conveyed by King Rat’s statement *You are very clumsy! I will pour it.*) are available during the story. In addition, the lessive reading is almost possible until King Rat remembered that Gray Rat was very clumsy and did not permit Gray Rat to pour the milk. So the lessive reading is denied and only the benefactive reading matches.

**Table 4.4**

*Summary of the expected responses for test item sample of the benefactive-matched items*

<table>
<thead>
<tr>
<th>Puppet’s statement</th>
<th>Child’s response if s/he accesses benefactive Reading</th>
<th>Child’s response if s/he accesses lessive Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gray Rat</td>
<td>True</td>
<td>False</td>
</tr>
</tbody>
</table>

**(3) Control item sample of the benefactive-matched scenario**

1. 有一天，巨人、小矮人、小丑一起出去吃饭。 One day, Giant, Dwarf, and Clown went out for dinner.

2. 只有巨人要了鸡蛋。小矮人说：“巨人啊，你的鸡蛋看起来可真好吃，我夹一个行吗？”。巨人说：“行是行……，可是你离得那么远，哪儿够得着啊，这样吧，我来夹一个放在你的盒子里。”巨人夹了一个鸡蛋放在了小矮人的盒子里。

Only Giant ordered eggs.

**Dwarf:** Giant, those eggs look really delicious! Could I take one egg?

**Giant:** Alright…But you are too small. How can you reach the egg across the table? I will do it.
Giant picked up one egg and put it on Dwarf’s plate.

3. 小丑见了也赶快递过盘子说：“你也往我的盘子里夹一个。”
巨人说：“嘿，小丑，你又不矮，你自己夹吗，我还要吃饭呢！”小丑刚要去夹，巨人发现盘子里只剩下一个鸡蛋了！他赶紧拦住了小丑说：“不行，不行，只剩下了一个了……，你不能夹了；我是个大肚皮，我还没吃饱呢，鸡蛋都是我的！”

Clown: Giant, could you please also pick up one egg and put it on my plate?
Giant: What? You are not so short and you can reach the egg! Don’t interrupt me!
Clown was about to take one egg, but the Giant found that he only had one egg left!
Giant: Stop! See? Only one egg left… I have a big belly. I want to eat it!

Experimenter’s question:
巨人给谁夹鸡蛋？
Jùrén gěi shuǐ jiā jīdàn?
giant GEI who take egg
‘For whom did Giant take the egg?’
‘Who did Giant let take the egg?’
(benefactive reading)
(lessive reading)

Puppet:
小丑 Xiǎochòu ‘Clown’
(mismatched on both readings)

In this story, Dwarf received the egg from Giant (benefactive reading=true), but did not receive permission to take the egg (lessive reading=false). Clown, however, did not receive the egg, nor permission to take the egg, and so both the benefactive and the lessive readings are false here. So if the child accesses the benefactive reading with this story, I expect the child to say ‘True’ only if the puppet says ‘Dwarf’. But if the child accesses the lessive reading only, I expect the child to say ‘False’ to the puppet, no matter what the puppet says.
This test item also satisfies the Condition of Plausible Dissent for the TVJT (Crain & Thornton, 1998). Since in this story, both the lessive reading (conveyed by Dwarf’s request to Giant *Could I take one egg?*) and the benefactive reading (conveyed by Giant’s statement *You are too small. How can you reach the egg across the table? I will do it.*) are available during the story. In addition, the lessive reading is almost possible until Giant found that Dwarf was too small and did not permit Dwarf to take the egg. So the lessive reading is denied and only the benefactive reading matches. Since this is a control item, I will only give the child the false answer, i.e., ‘Clown’. I expect the child to say ‘False’. By using the control items, I can get ‘False’ responses. Then if the child says ‘True’ to all of the critical test items, it is because the child accesses both readings, not because the child exhibits a yes-bias.

(4) Filler item sample (*who*-object question)

1. 一天，公鸡告诉母鸡：“我在小河那边的草丛里发现了很多好吃的虫子。你可以去那边捉虫子吃。” One day, Rooster told Hen, “I found lots of caterpillars on the riverside. They are very tasty. You can go there to get some.”

2. 小鸡正好到家了，公鸡也想把虫子的事告诉小鸡。Chick happened to come home. Rooster was about to tell Chick about the secret.
3. 可是母鸡悄悄地对公鸡说： “我听说最近有一条大青蛇常常到小河那边，所以你最好不要告诉小鸡虫子的事，小鸡还小，她去太危险了。” 公鸡听了就没有把虫子这件事告诉小鸡。

However, Hen whispered to Rooster, “I also heard that recently a big snake came there. You’d better not tell Chick. She is too young. It is too dangerous for her to go over there.” So Rooster did not tell Chick about the caterpillars.

**Experimenter’s question:**

公鸡把虫子的事告诉了谁？

To whom did Rooster tell the secret?

Puppet: 小鸡 Chick (mismatched)

### 4.2 Participants

#### 4.2.1 Child participants

Child participants were mainly recruited from five local preschools. There were about 500 children in one preschool; the other preschools had about 200 children each. The children were both native Mandarin speakers and natives of Shijiazhuang. Altogether, 96 younger Mandarin-speaking children were tested. To be included in the final analyses, child participants were screened twice.

**First screen:** The first screen was conducted at the beginning of each encounter to determine whether the child would continue to participate in the study. The following conditions constituted the grounds for excluding the child from further participation in the experiment:
(1) If the child responded incorrectly to all of the first three test items;
(2) If the child showed a yes- or no-bias determined by three consecutive ‘yes’ or ‘no’ responses;
(3) If the child exhibited attention problems;
(4) If the child had communication problems (some of the younger children were too shy to talk with and respond to the experimenter).

Based on these criteria, I excluded 20 children in the first screen: 17 children from the 3-year-olds, 3 children from the 4-year-olds, and none from the 5-year-olds.

**Second screen:** The children who passed the first screen and who completed all the test items were screened a second time to qualify for inclusion in the final analyses based on their individual accuracy rates of the control items and the filler items. Children who answered both control items correctly (i.e., with a 100% accuracy) AND answered 6 or more out of 8 filler items correctly (i.e., with an accuracy above 75%) were included in the final analyses. Their answers constituted the final results for this study. After the second screen, another 20 children were excluded, and I finally obtained analyzable results from 56 child participants.

### 4.2.2 Adolescent participants

Twenty adolescents aged 10-12 from a local elementary school were tested. Adolescent participants were all native Mandarin speakers, and most were monolingual speakers of Mandarin. The majority of adolescent participants were natives of Shijiazhuang. Based on the standards of the second screen applied to the child group, 9 adolescents were included in the final analyses.

---

9 31 children (out of 56) did not get 100% accuracy on the filler items, 9 children of which correctly rejected all of the 6 mismatched answers, 19 of which correctly rejected 5 out of the 6 mismatched answers, and 3 of which correctly rejected 4 of the 6 mismatched answers. Children’s overall accuracy rate of correct rejection to the mismatched answers is about 87%. So children did not seem to exhibit yes-bias.
4.2.3 Adult participants

Eighty-eight adult participants were recruited from local companies and colleges. Adult populations included a combination of workers, technicians, and undergraduate students. Each adult participant had received either a secondary education or a higher education degree. Adult participants were all native Mandarin speakers, and most were monolingual speakers of Mandarin. The majority of adult participants were natives of Shijiazhuang. Based on the standards of the second screen applied to the child group, 74 adult participants were included in the final analyses. In addition, the adult participant’s accuracy of filler items was above 87.5%, i.e., 7 out of 8 items. This was after each adult had met the standard of a 100% accuracy on control items.

The demographic information on all of the participants included in the final analyses is presented in Table 4.5.

Table 4.5
Child, adolescent, and adult participants in the present study

<table>
<thead>
<tr>
<th></th>
<th>Number</th>
<th>Age range</th>
<th>Mean age</th>
</tr>
</thead>
<tbody>
<tr>
<td>3–year-old children</td>
<td>15</td>
<td>3;2-3;11</td>
<td>3;7</td>
</tr>
<tr>
<td>4–year-old children</td>
<td>23</td>
<td>4;0-4;10</td>
<td>4;4</td>
</tr>
<tr>
<td>5–year-old children</td>
<td>18</td>
<td>5;0-5;8</td>
<td>5;3</td>
</tr>
<tr>
<td>Adolescents</td>
<td>9</td>
<td>10-12</td>
<td>11.2</td>
</tr>
<tr>
<td>Adults</td>
<td>74</td>
<td>20-52</td>
<td>32</td>
</tr>
</tbody>
</table>
4.3 Procedures

4.3.1 Children

Each child was tested individually in a separate room at the preschool. It generally took about 30 minutes for 4-year-olds and 5-year-olds to finish all of the test items, and about 40 minutes for 3-year-olds to finish, including the time to communicate, paste stickers, etc. Since this was a fairly long session for a child, in the middle of the test, the experimenter pasted a cartoon sticker on the child about every three or four test items in order to encourage the child to continue to finish all of the test items.

**Step 1.** The experimenter explained to the child what to do at the beginning as follows: “You will listen to some stories with pictures. A puppet lion will listen to these stories with you too. At the end of the story, I will ask the puppet lion a question, and the puppet lion will answer it. Then you will show me whether the puppet lion says the right thing or not by pasting different stickers for him on an answer sheet: paste a smiling face if the puppet lion says the right thing, and a sad face if the puppet lion doesn’t say the right thing.” Then the experimenter asked the child if s/he fully understood what to do. In the meantime, the experimenter showed the child the picture booklet, the puppet lion, two kinds of face stickers, the answer sheet, and directed the child to paste the face sticker in the correct position on the answer sheet.

**Step 2.** There was a training session using 2 training items; for one the puppet lion said the right thing, and for the other the puppet lion did not say the right thing. The experimenter helped the child to get used to the speed and manner of the narration, and directed the child to listen carefully to the stories and to the puppet lion’s answers, and then to paste the face stickers for the puppet lion in a proper way.
**Step 3.** The child listened to the 16 test stories with accompanying pictures. Then the experimenter asked one question in the end and the puppet lion answered the question. The child indicated whether the puppet lion said the right thing or not by pasting different face stickers, as the child was directed at the very beginning.

**Step 4.** After each test item, the experimenter asked follow-up questions about why the child came up with that answer. The experimenter briefly wrote down the children’s responses to these follow-up questions and their justifications.

**Step 5.** An oral survey was also conducted to obtain each child’s demographic information (e.g., birthday, family, etc.) and language background (e.g., communication, exposure to language, etc.) by asking the preschool teachers or parents before or after the experiment.

**4.3.2 Adolescents and adults**

The experimenter printed out the same test items (without accompanying pictures) that were used with the children. Each adolescent/adult participant read the test items and decided if the answer given after each was possible or impossible. Then the adolescent/adult marked the decision (possible/impossible) on an answer sheet. Adolescent/adult participants were also requested to briefly write out their justifications.
**CHAPTER 5**

**EXPERIMENTAL RESULTS**

The experimental results from the modified TVJT were analyzed under three grouping conditions (for the individual result of all the participants included in the final analyses, see Appendix IV). Grouping 1 consists of all children, adolescents, and adults. Grouping 2 breaks all the children into the younger child group (under 3;10) and the older child group (3;10 and above) in order to compare the 10 youngest children with the rest of the children. Then it compares the child subgroups with the adolescents, and the adults. Grouping 3 is based on the chronological ages: 3-year-old child group, 4-year-old child group, and 5-year-old child group. Because no statistically significant within-group or between-group difference among the child subgroups was detected under grouping 3 (for the results of grouping 3, see Appendix V), this chapter only reports the results under grouping 1 and grouping 2.

The first section of this chapter reports the results under grouping 1: all children, adolescents, and adults. This section aims to examine whether children’s responses are adult-like. The second section reports the results under grouping 2. The fine-grained comparison among the child subgroups is aimed to investigate whether there are any developmental patterns across age groups. The third section examines the experimental results in general to see whether there is (1) a significant effect of the benefactive condition and/or the lessive condition, and (2) a significant effect of the interaction between age and condition. The last section of this chapter summarizes the main findings. The present study set the \( p \)-value at .05; thus any \( p \)-value less than .05 is considered significant.

---

\(^{10}\) The cut-off age was set at which the significant difference on the two readings was found.
5.1 Results under grouping 1: Child group, adolescent group, and adult group

5.1.1 Child group

Graph 5.1 shows that the child group’s mean acceptability rate of the lessive-matched items (94%) is higher than that of the benefactive-matched items (88%).

![Graph 5.1 Within-group comparison: children, adolescents, and adults](image)

<table>
<thead>
<tr>
<th></th>
<th>a. child group</th>
<th>b. adolescent group</th>
<th>c. adult group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>56</td>
<td>9</td>
<td>74</td>
</tr>
<tr>
<td>Age range</td>
<td>3;2-5;8</td>
<td>10-12</td>
<td>20-52</td>
</tr>
<tr>
<td>Mean age</td>
<td>4;5</td>
<td>11;2</td>
<td>32</td>
</tr>
</tbody>
</table>

Graph 5.1 Within-group comparison: children, adolescents, and adults

The paired T-test reveals that the child group’s difference on the lessive-matched condition and the benefactive-matched condition is significant, $t(55) = 2.11$, $p = .04$ (see Table 5.1).
### Table 5.1

**Within-group acceptability differences on the lessive condition and the benefactive condition**

<table>
<thead>
<tr>
<th>Grouping</th>
<th>N</th>
<th>Mean (SD)</th>
<th>Mean (SD)</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grouping 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All children</td>
<td>56</td>
<td>.94(.13)</td>
<td>.88(.23)</td>
<td>2.11</td>
<td>.04*</td>
</tr>
<tr>
<td>Adolescents</td>
<td>9</td>
<td>.59(.37)</td>
<td>.93(.22)</td>
<td>-1.99</td>
<td>.08</td>
</tr>
<tr>
<td>Adults</td>
<td>74</td>
<td>.64(.34)</td>
<td>.98(.10)</td>
<td>-8.25</td>
<td>.00***</td>
</tr>
<tr>
<td>Grouping 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children-below 3;10</td>
<td>10</td>
<td>.93(.14)</td>
<td>.73(.34)</td>
<td>2.24</td>
<td>.05*</td>
</tr>
<tr>
<td>Children-3;10 above</td>
<td>46</td>
<td>.94(.13)</td>
<td>.91(.18)</td>
<td>1.16</td>
<td>.25</td>
</tr>
</tbody>
</table>

*: p < .05; **: p < .01; ***: p < .001

### 5.1.2 Adolescent group and adult group

For both the adolescent group and the adult group, the mean acceptability rate of the lessive-matched items (59% and 64%, respectively) is lower than that of the benefactive-matched items (93% and 98%, respectively). The adult group has a significant within-group difference on the lessive-matched condition and the benefactive-matched condition, $t(73) = -8.25$, $p < .001$. Thus the benefactive-matched items are accepted significantly more often than the lessive-matched items. Although the acceptability means for the adolescent group on the lessive-matched condition (59%) and the benefactive-matched condition (93%) are quite different, this difference is not statistically significant, $t(8) = -1.99$, $p = .08$. This may be due to the small sample size (n=9) of the adolescent group (see Table 5.1).

### 5.1.3 Comparison among children, adolescents, and adults

Graph 5.2 shows that the child group’s acceptability rate of the lessive-matched items is the highest (94%), the adult group is much lower (64%), and the adolescent group is the lowest
(59%). In contrast, the adult group’s acceptability rate of the benefactive-matched items is the highest (98%), the adolescent group is also high (93%), and the child group is the lowest (88%).

<table>
<thead>
<tr>
<th></th>
<th>a. child group</th>
<th>b. adolescent group</th>
<th>c. adult group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>56</td>
<td>9</td>
<td>74</td>
</tr>
<tr>
<td>age range</td>
<td>3;2-5;8</td>
<td>10-12</td>
<td>20-52</td>
</tr>
<tr>
<td>mean age</td>
<td>4;5</td>
<td>11.2</td>
<td>32</td>
</tr>
</tbody>
</table>

Graph 5.2 Between-group comparison: children, adolescents, and adults

The one-way ANOVA test reveals that there are significant between-group differences both on the lessive-matched condition, $F(2, 136) = 21.06, p < .001$, and on the benefactive-matched condition, $F(2, 136) = 5.76, p = .004$. Further T-tests reveal the following fine-grained between-group differences (see Table 5.2).
Table 5.2  
Between-group acceptability differences on the lessive condition and the benefactive condition

<table>
<thead>
<tr>
<th>Grouping</th>
<th>Statistics : Mean (SD)</th>
<th>F</th>
<th>p-value</th>
<th>Groups having significant differences</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grouping 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. All children (n=56)</td>
<td>b. Adolescents (n=9)</td>
<td>c. Adults (n=74)</td>
<td>Lessive</td>
<td>.94(.13)</td>
</tr>
<tr>
<td>Benefactive</td>
<td>.88(.23)</td>
<td>.93(.22)</td>
<td>.98(.10)</td>
<td>5.76</td>
</tr>
<tr>
<td><strong>Grouping 2</strong></td>
<td>a. Children-below3;10 (n=10)</td>
<td>b. Children-3;10 above (n=46)</td>
<td>c. Adolescents (n=9)</td>
<td>d. Adults (n=74)</td>
</tr>
<tr>
<td>Benefactive</td>
<td>.73(.34)</td>
<td>.91(.18)</td>
<td>.93(.22)</td>
<td>.98(.10)</td>
</tr>
</tbody>
</table>

*: p < .05; **: p < .01; ***: p < .001

(1) The child group and the adult group have significant between-group differences both on the lessive-matched condition, $t (99) = 7.07, p < .001$, and on the benefactive-matched condition, $t (72) = -3.16, p = .002$.

(2) The child group and the adolescent group have a significant between-group difference on the lessive-matched condition, $t (8) = 2.84, p = .02$, but not on the benefactive-matched condition, $t (63) = .69, p = .54$.

(3) The adolescent group and the adult group do not show statistical significance either on the lessive-matched condition, $t (81) = .41, p = .69$, or on the benefactive-matched condition, $t (8) = .69, p = .51$.

The above results under the first grouping suggest the following two points:
(1) Children are not adult-like in comprehending gēi’s two readings. The adults strongly prefer to understand gēi in a benefactive manner rather than in a lessive manner, whereas the children prefer to understand gēi in a lessive manner.

(2) The results of the adolescents and the adults are similar in that both the adolescents and adults have a strong preference towards the benefactive reading.

The following section breaks down the child participants into sub-age groups in order to examine if there are any differences between child subgroups.

5.2 Results under grouping 2: Younger child group (under 3;10), older child group (3;10 and above), adolescent group, and adult group

5.2.1 Child within-group differences

Graph 5.3 shows that for both two child subgroups, the mean acceptability rate of the lessive-matched items (93% and 94%, respectively) is higher than that of the benefactive-matched items (73% and 91%, respectively).

The paired T-test reveals that the younger child group has a significant within-group difference between the lessive-matched condition and the benefactive-matched condition, $t(9) = 2.24, p = .05$. The older child group does not have a significant within-group difference on these two conditions, $t(45) = 1.16, p = .25$ (see Table 5.1). Thus the younger children have a preference for the lessive reading, while the older children are more balanced in their preferences.

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11 Across the three grouping methods, the statistical analyses are always applied to the adolescents and the adults in addition to the child subgroups. I do not report the comparison between the adolescents and the adults in Section 5.2 in order to avoid repeating the same results in Section 5.1.
Graph 5.3 Within-group comparison: younger children, older children, adolescents, and adults

5.2.2 Child between-group differences

Graph 5.4 shows that for the lessive-matched items, the two child subgroups’ acceptability rates are almost equally high, which are 93% and 94% respectively. In contrast, for the benefactive-matched items, the older child group’s is also high (91%), while the younger child group’s is lower (73%).
Graph 5.4  Between-group comparison: younger children, older children, adolescents, and adults

Under grouping 2, the one-way ANOVA reveals that there are significant between-group differences both on the lessive-matched condition, $F(3, 135) = 13.94$, $p < .001$, and the benefactive-matched condition, $F(3, 135) = 7.05$, $p < .001$. Further T-tests reveal that between the younger child group and the older child group, there is no significant difference on the lessive-matched condition, $t(54) = .19$, $p = .85$, but there is a significant difference on the benefactive-matched condition, $t(54) = 2.28$, $p = .03$ (see Table 5.2).
5.2.3 Comparison between child subgroups and adults/adolescents

(1) Between the younger child group and the adult group, there are significant differences both on the lessive-matched condition, \( t(27) = 4.99, p < .001 \), and on the benefactive-matched condition, \( t(9) = -2.22, p = .05 \). Between the younger child group and the adolescent group, there is a significant difference on the lessive-matched condition, \( t(10) = 2.64, p = .03 \), but not on the benefactive-matched condition, \( t(17) = -1.42, p = .17 \).

(2) Between the older child group and the adult group, there are significant differences both on the lessive-matched condition, \( t(118) = 5.85, p < .001 \), and on the benefactive-matched condition, \( t(118) = -2.77, p = .01 \). Between the older child group and the adolescent group, there is a significant difference on the lessive-matched condition, \( t(53) = 5.23, p < .001 \), but not on the benefactive-matched condition, \( t(53) = -0.28, p = .78 \).

In conclusion, grouping 2 again confirms significant differences on both readings between child subgroups and adults/adolescents. Importantly, grouping 2 detects both a significant difference within the younger children group on two readings \( (p = .05) \) and a significant difference between the younger children and the older children on the benefactive reading \( (p = .03) \). This shows a developmental course which I will now describe.
5.2.4 Developmental pattern

Applying grouping method 2, which sets the cut-off point at the age of 3;10, a significant within-group difference ($p = .05$) is detected in the younger child group. On the other hand, a significant difference ($p = .03$) on the benefactive-matched condition is found between the younger child group and the older child group, although they do not have a significant difference on the lessive-matched condition. The results from the child subgroups, coupled with the adolescents’ and adults’ results, exhibit a developing pattern involving three stages. Figure 5.1 diagrams the three developmental stages.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Group</th>
<th>Age</th>
<th>Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>younger children</td>
<td>&lt; 3;10</td>
<td>lessive &gt; benefactive</td>
</tr>
<tr>
<td>Stage II</td>
<td>older children</td>
<td>$\geq$ 3;10</td>
<td>lessive = benefactive</td>
</tr>
<tr>
<td>Stage III</td>
<td>adolescents/adults</td>
<td>$\geq$ 10</td>
<td>lessive &lt; benefactive</td>
</tr>
</tbody>
</table>

**Figure 5.1 Developmental patterns in the present study**

The first stage, i.e., children under 3;10, shows a preference towards the $gêî$ lessive reading over the benefactive reading, and the difference between these two conditions is significant ($p = .05$).

At the second stage, i.e., children who are 3;10 and above, the acceptability rate of the benefactive reading increases but it is still numerically lower (not significantly, though) than that of the lessive reading. In addition, between the older children and the younger children, the difference on the benefactive-matched condition is significant ($p = .03$).

The third stage is the adult stage. The adult group shows a highly significant difference
between the lessive-matched condition and the benefactive-matched condition. The adult group also significantly differs from both the younger child group and the older child group on both the lessive-matched condition and the benefactive-matched condition. The adolescents’ pattern is very similar to the adults as discussed before. So the third developmental stage extends to include the adolescents. Both the adult group and the adolescent group strongly prefer to understand gei in a benefactive manner.

5.3 The significance of the condition effect, and the significance of the interaction between age and condition

5.3.1 The significance of the condition effect

The paired T-test reveals that across the two grouping conditions, there is always a significant difference between the average acceptability rate of the lessive-matched items and the average acceptability rate of the benefactive-matched items, \( t (138) = -5.49, p < .001 \) (see Table 5.3)

Table 5.3

Acceptability rate differences by conditions

<table>
<thead>
<tr>
<th>Acceptability rate</th>
<th>N</th>
<th>Mean (SD)</th>
<th>t</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptability rate of lessive condition</td>
<td>139</td>
<td>.76(.31)</td>
<td>-5.49</td>
<td>.00***</td>
</tr>
<tr>
<td>Acceptability rate of benefactive condition</td>
<td>139</td>
<td>.93(.18)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: \( p < .05 \); **: \( p < .01 \); ***: \( p < .001 \)
5.3.2 The significance of the interaction between age and condition

The Pearson correlation test reveals that across the two grouping conditions, the age group always has significant correlation with the lessive-matched condition and the benefactive-matched condition. That is, the age group variable and the lessive-matched condition variable are negatively correlated: under grouping 1, \( r (137) = -0.46, p < 0.001 \); under grouping 2, \( r (137) = -0.46, p < 0.001 \). This suggests that participants who are older tend to reject the lessive reading compared to the younger participants. On the other hand, the age group variable and the benefactive-matched condition variable are positively correlated: under grouping 1, \( r (137) = 0.28, p = 0.001 \); under grouping 2, \( r (137) = 0.27, p = 0.001 \). This suggests that participants who are older tend to accept the benefactive reading compared to the younger participants (see Table 5.4).

Table 5.4
Levels of coefficient of correlation (r) between variables of age and conditions

<table>
<thead>
<tr>
<th></th>
<th>Acceptability rate of lessive reading</th>
<th>Acceptability rate of benefactive reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age in grouping 1</td>
<td>-.46***</td>
<td>.28**</td>
</tr>
<tr>
<td>Age in grouping 2</td>
<td>-.46***</td>
<td>.27**</td>
</tr>
<tr>
<td>Acceptability rate of lessive condition</td>
<td></td>
<td>-.12</td>
</tr>
<tr>
<td>Acceptability rate of benefactive condition</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*: p < .05; **: p < .01; ***: p < .001

5.4 Main findings

Finally, I summarize the main findings from the analyses of the experimental results in view of the research questions.

(1) The adults strongly prefer to understand gěi in a benefactive manner rather than in a lessive manner.
(2) The adolescent group’s results are quite similar to the adult group. The adolescents, like the adults, also have a strong preference towards the benefactive reading.

(3) Children access both readings from earliest tested ages, about 3 years of age. Children’s acceptability rates of gé-LESS and gé-BEN are not adult-like. The younger the children are, the more different they are from the adults.

(4) Younger children show a preference towards the lessive reading over the benefactive reading, and the difference between the lessive reading and the benefactive reading is statistically significant.

(5) Older children are balanced in their preferences compared to younger children, and the difference between the lessive reading and the benefactive reading is not statistically significant.

These main findings are also supported by the individual data shown in Table 5.5.

Table 5.5

*Preference among the individual participants across the critical items*

<table>
<thead>
<tr>
<th>Participants (N)</th>
<th>Accepted all of the lessive matched items and the benefactive matched items</th>
<th>Balanced on two readings (rejected one item on each condition)</th>
<th>Preferred the lessive reading</th>
<th>Preferred the benefactive reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Children (56)</td>
<td>35 (63%)</td>
<td>4 (7%)</td>
<td>12 (21%)</td>
<td>5 (9%)</td>
</tr>
<tr>
<td>Adolescents (9)</td>
<td>2 (22%)</td>
<td>0 (0%)</td>
<td>1 (11%)</td>
<td>6 (67%)</td>
</tr>
<tr>
<td>Adults (74)</td>
<td>23 (31%)</td>
<td>1 (1%)</td>
<td>2 (3%)</td>
<td>48 (65%)</td>
</tr>
</tbody>
</table>
CHAPTER 6
DISCUSSIONS OF THE EXPERIMENTAL RESULTS AND CONCLUSIONS

The experimental results presented in the preceding chapter suggest that child participants in the present study are not adult-like in comprehending gēi-BEN and gēi-LESS. Children, especially younger children, tend to understand gēi in a lessive manner over a benefactive manner, whereas adults are the opposite. The children’s average acceptability rate of the gēi lessive-matched items is statistically significantly higher than adults. In contrast, the children’s average acceptability rate of the gēi benefactive-matched items is statistically significantly lower than adults. Moreover, the adults’ results are in line with the frequencies of the two types of gēi instances in naturalistic corpora, whereas children acquire the less frequent gēi-LESS slightly earlier than the much more frequent gēi-BEN.

This chapter first evaluates the two hypotheses in Chapter 3: the Frequency Effect Hypothesis (FEH) and the Semantic Extension Hypothesis (SEH). The experimental results do not support the FEH, but are more compatible with the prediction of the SEH. Then I will conclude by summarizing the present study, qualifying its limitations, and offering a few remarks on possible directions for further research.

6.1 Evaluation of the Frequency Effect Hypothesis (FEH)

According to the FEH, if there is a considerable difference between the frequency of gēi-BEN and gēi-LESS in the input, then children are expected to acquire the more frequent one first because they are exposed to its occurrence more frequently. The frequency of gēi in the Tardif corpus (1993) demonstrates that gēi-BEN is statistically significantly more frequent than
gēi-LESS (see Chapter 2). Accordingly, FEH predicts earlier acceptance of the gēi benefactive-matched items than the gēi lessive-matched items in the modified TVJT.

The findings from the modified TVJT show that the adults’ results are consistent with this prediction, since the adults’ acceptability rate of the gēi benefactive-matched items is significantly higher than that of the gēi lessive-matched items. The adolescents’ results are also in line with the prediction. However, the children’s acceptability rate of the gēi benefactive-matched items is lower than that of the gēi lessive-matched items, and this difference is significant in the younger child group (under 3;10). These results do not support the prediction of the FEH.

6.1.1 Adults’ results and FEH

The present study suggests that frequency doesn’t affect children and adults equally. It is relatively easy to make sense of the adults’ results on the frequency effect account. According to Ellis (2002), “fluent adults have a vast statistical knowledge about the behavior of the lexical items of their language,” and “this knowledge has been acquired through experience with input that exhibits these distributional properties and through knowledge of its semantics” (p. 160). Given the substantial frequency difference between gēi-BEN and gēi-LESS in naturalistic corpora, it is reasonable to infer that the majority of adults are biased toward the gēi benefactive reading over the gēi lessive reading, as we would expect from the frequency effect. In their written justifications, several adult participants used paraphrasing words to indicate that gēi was ambiguous and that it had both the benefactive reading and the lessive reading. However, the manner in which these participants verbalized their justifications indicates that the benefactive reading is still preferable despite their sense that the lessive reading is possible. For
example, one participant wrote: “Gěi has lots of meanings. It is ambiguous. It could mean both wèi ‘for the sake of’ and ràng ‘let’. However, I feel wèi (for the sake of) is better somehow.” Overall, the compatibility between the results of the adult participants and the frequencies of the two types of gěi patterns confirms that adults are more subject to the frequency of gěi.

6.1.2 Children’s results and FEH

The adults’ acceptability rates of the two gěi readings are in line with the statistically significant frequency difference between these two types of gěi in corpora (see Chapter 2). In contrast, children’s results do not match what was found in corpora, especially with the case of children’s acceptability rate of the lessive reading, which is statistically significantly higher than adults ($p < .001$). It seems that children acquire gěi-LESS before the much more frequent gěi-BEN in the input. The child group’s acceptability rate of the benefactive-matched items is relatively high, but it is still statistically lower than that of the adult group ($p = .002$), which is at odds with the considerably more frequent occurrence of gěi-BEN in the input. These findings obviously do not conform to the prediction of the FEH in the usage-based approach.

First of all, the child data are not abnormal. Despite some evidence of correlations between the frequency in the input and child language development (as discussed in Chapter 3), investigators have found exceptions, similar to the gěi lessive sense in the present study, such as when children appear to learn certain infrequent verb senses or constructions relatively easily and earlier.

For instance, Israel (2004) studied child language acquisition of the English multiple meaning word *get*. Israel examined the data from one diary study and seven longitudinal corpora based on six basic *get* senses and the corresponding *get* constructions. His study
reported that children learn the ditransitive use of *get* (cause obtain), as in *I got Sally the ball*, earlier than the frequency effect would predict. Despite the ditransitive use accounting for only 2% to 3% of the input, children often produce it before the *get* sense with higher frequency such as ‘become’ as in *Twiggy got drunk* or cause move as in *Sally got me into the show*. This is the most common exception in his study, and “it is striking that this occurs for three out of four of the children” (Israel 2004: 12; Parisien & Stevenson 2009). Recently, Parisien & Stevenson (2009) employed token-level clustering methods to simulate children’s acquisition of the senses of a polysemous verb also by using *get* as a case study, with reference to Israel’s (2004) study among others. Although this method supposedly clusters usages of *get* drawn from a child-directed speech corpus, the clustering results in the model do not sufficiently account for the acquisition sequence of the polysemy observed in children, since “children do not show a consistent correlation between frequency and age of acquisition” (Parisien & Stevenson 2009: 6).

To the degree that these findings incompatible with the Frequency Effect Hypothesis are valid, it seems fair to suggest that the role of frequency in acquisition of multiple meanings or constructions “is not a hard-and-fast rule” (Parisien & Stevenson 2009: 4).

### 6.1.3 Constraints on frequency as a learning mechanism

The discussions of the constraints on frequency as a learning mechanism are inconclusive. Researchers tentatively proposed some possible explanations. First, “frequencies also interact with a number of other factors in affecting learning” (Lieven 2010: 2547). These include acoustic/phonological/prosodic salience, position in the utterance, semantic transparency,
pragmatics, and the child’s communicative goals. Second, frequency does not influence various aspects of language equally. For example, Naigles & Hoff-Ginsberg (1998) suggested that “the type of input frequency that has been shown to be important in vocabulary acquisition occurs within the open class of words, i.e. nouns, verbs, adjectives, adverbs,” and “frequency plays a role in the acquisition of intrinsically meaningful, as opposed to grammatical, lexical items” (p. 116). This shows that frequency itself is not a straightforward measure, and assessing the role of frequency is more complicated than simply counting the morphemes, words, or constructions in the input and their output in the child’s speech.

Due to the methodology employed in the present study, we cannot discover whether one of the proposed variables discussed above might be interacting with the frequency of 他. The present study at least indicates that the frequency seems to play an important role only after some late point of the developmental course. I now turn to the Semantic Extension Hypothesis and its prediction.

6.2 Evaluation of the Semantic Extension Hypothesis (SEH)

The SEH posits that the 他 benefactive pattern and the 他 lessive pattern share the same semantics since they both are derived from the core meaning of verbal 他, which is ‘transfer’, and the lessive pattern is acquired slightly earlier than the benefactive pattern as shown by the corpus data in Wong’s (2004) study. On the assumption that Mandarin-speaking children do not cognitively differ from Cantonese-speaking children in extending the literal meaning of 他, then we would expect the acquisition sequence of the Mandarin 他-BEN and 他-LESS to parallel the sequence found in Cantonese, i.e., the lessive pattern is acquired before the benefactive pattern.
6.2.1 Children’s results and SEH

The corpus data in Wong’s (2004) study suggested that gehi-LESS is acquired before gehi-BEN. This is mainly based on the earliest age of emergence and the mean frequency of each gehi pattern in children’s natural speech. The age range of the children in Wong’s (2004) study is between 1;10.30 to 3;04.22, and the oldest child is younger than the mean age of the younger child group in the present study (3;6). Although Wong’s study did not provide data about children beyond 3;04, the younger child group’s comprehension results in the present study seem to be in line with Wong’s production data to the extent that children access the two gehi readings very early in both studies and children acquired gehi-LESS slightly earlier than gehi-BEN.

6.2.2 Adults’ results and SEH

Wong’s study was focused on child language acquisition. He did not predict the developmental course beyond the earliest stage.

The present study shows that there is a drastic transition from children to adults, since both the difference on the two gehi readings in adults and the difference between children and adults on these two readings become statistically significant. This accords with Taylor’s (2003) point that one problem with the SEH is that it does not address whether the meaning network has any effect on the already acquired forms and uses, even if we suppose a more complex meaning radial network gradually takes shape over time (Taylor 2003). That is to say, the SEH does not answer whether and how the form and use learned later will affect the ones first learned. In the case of gehi in the present study, my empirical data suggest that gehi-BEN is acquired a little later, but we don’t know how this actually affects the gehi-LESS which is acquired earlier solely on the
SEH account. The SEH account does not adequately explain the changes we find on the acceptability rates of the two readings across the board in the experiments.

6.2.3 Remaining problems regarding SEH

There are some remaining problems regarding the Semantic Extension Hypothesis.

With respect to Wong’s inference that the ǧēi meaning network actually operates, especially with respect to the semantic relation between ǧēi-LESS and ǧēi-BEN, these premises need further investigation. This is because, as Taylor (2003) pointed out, even though an ingenious linguist is able to explain how heterogeneous senses of a word might be related, it has been hotly debated whether and how this network of different senses is indeed represented in the speaker’s mental grammar (Taylor 2003).

It is unclear whether there indeed is a semantic relation between these forms of ǧēi, i.e., it may be that ǧēi-LESS and ǧēi-BEN are related to the meaning of ‘give’, and therefore these two forms together are acquired later than the full verb form of ǧēi, but this does not help us with the question of why children acquire the lessive meaning before the benfactive meaning as found in the present study. For that, we will have to seek an answer elsewhere.

One possible avenue for investigation in this matter might come from the idea that modality is somehow primal. A very preliminary speculation in this direction is that cross-linguistic findings show that children, including Mandarin-speaking children, acquire permissive modals very early (Bassano 1996; Choi 1995; Guo 1993,1994; Papafragou 2001; Shatz & Wilcox 1991; Stephany 1993), suggestively around 3 years of age. Moreover, younger children

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12 Taylor (2003) also cited Hallan’s (2001) study which found that children can master two remotely connected meanings of a word at about the same time. “Hallan (2001) notes that the earliest uses of over to emerge in child language involve the expressions over here/over there and fall over. There is no obvious relation between these two (on network accounts, very marginal and distantly related) uses” (Taylor 2003: 644).
may apply permissive modal expressions to encode a larger variety of contexts (e.g., challenging, boasting, prohibitive, argumentative) than adults (Guo 1993, 1994). These might facilitate Mandarin-speaking children mapping permissive meaning to the ُُُگِّî patterns, and result in children’s better performance on the ُُّگِّî lessive reading. But to go beyond this preliminary speculation will require more detailed investigations to the early acquisition of permissive modality.

The methodology in the present study is insufficient to answer these follow-up questions with any conclusiveness. Nonetheless it is fair to conclude, on the basis of comparing the experimental results between children and adults, children’s readiness to accept ُُّگِّî in a lessive manner is due less to the impact of the frequency of adult input than to the influence of the semantic meaning of ُُّگِّî or some other undiscussed reasons.

6.3 Summary and concluding remarks

To conclude, this thesis investigates Mandarin-speaking children’s accessibility and acquisition sequence of ُُّگِّî-BEN and ُُّگِّî-LESS. These two patterns follow the same surface word order but have different meanings. Employing a modified Truth Value Judgment Task, this research evaluates (1) the Frequency Effect Hypothesis (FEH), which predicts that ُُّگِّî-BEN is acquired earlier than ُُّگِّî-LESS, because the former occurs in natural conversation more frequently than the latter, and (2) the Semantic Extension Hypothesis (SEH), which predicts ُُّگِّî-LESS is acquired earlier than ُُّگِّî-BEN, because they both are derived from the verbal meaning of ُُّگِّî and ُُّگِّî-LESS has some advantages in its semantics. The present study suggests:

(1) Children’s treatment of ُُّگِّî-BEN and ُُّگِّî-LESS is not adult-like. Both the adolescents and the adults have strong preference for interpreting ُُّگِّî in a benefactive manner over the lessive
manner. In contrast, children seem to access the two ḡī readings very early, and they have a slightly heightened tendency to understand ḡī in a lessive manner. This is especially the case with the younger children (under 3;10).

(2) The adults’ acceptability rates of the ḡī lessive-matched items and the ḡī benefactive-matched items are in line with the statistically significantly different frequencies between these two types of ḡī instances in corpora, whereas children’s results are not in line with what was found in corpora. It seems that children acquire the ḡī-LESS a little earlier than the much more frequent ḡī-BEN in the input.

(3) The experimental results suggest that frequency does not have a straightforward effect on child acquisition of ḡī-BEN and ḡī-LESS. The experimental results are more compatible with the prediction of the Semantic Extension Hypothesis. However, further research is needed to investigate whether children’s slightly earlier acquisition of ḡī-LESS is actually due to the semantic meaning of ḡī or to some other factors.

6.4 Possible directions for further research

This research project examined only a small part of a much larger domain of related questions. From a broader perspective, ḡī constructions have recently received a great deal of attention in theoretical linguistics (Huang 2004; Huang & Ahrens 1999; Iwasaki 1997; Lord, Yap, & Iwasaki 2002; Mueanjai & Thepkanjana 2008; Newman 1993, 1996; Song 1997; Thepkanjana & Uehara 2008; Xu 1994; Yap & Iwasaki 1998, 2007, among many others). With regard to language development, some scholars have begun investigating the syntactic category assignment of ḡī, its grammaticalization path, and the grammaticalization path’s relation with
language development (Ting & Chang 2004; Wong 2004). Another area of research is focused on the causative-passive link via the common morpheme ‘give’. Several linguists have suggested that passive constructions could evolve from permissive-causative ‘give’ constructions via the reflexive context (Harpelmath 1990; Knott 1995; Wong 2004; Yap & Iwasaki 2007). This thesis only experimentally investigates Mandarin-speaking children’s accessibility and acquisition sequence of gěi-BEN and gěi-LESS by looking at children’s acceptability rates of these two readings. It suggests some directions for further studies.

First, we need a detailed analysis of the deep structure of the gěi benefactive pattern and the gěi lessive pattern in order to see if it influences the acquisition sequence of the two patterns.

Second, since the test items under the benefactive-matched condition and the lessive-matched condition are different items, the present study alone cannot fully address the issue of the ambiguity. Further study should investigate how to design the same item involving two readings, or use other methodologies, e.g., sentence-picture-matching, to retest how children treat the two gěi readings when everything is equal. Another possible test is RT (reaction time) studies. If the experimental findings of the present study are reliable, RT studies should reveal adults’ quicker reactions to gěi sentences when the sentences are intended as benefactive, but slower reactions when they are intended as lessive, whereas the opposite should be true for children.

Third, evidence from cross-linguistic research is needed. The present study needs to be replicated in other languages, for example, Thai (Thepkanjana & Uehara 2008) where the verbal give (hây) is also ambiguous between the benefactive reading and the lessive reading. This
would allow us to test whether the same preference toward the lessive reading is consistent with that of Mandarin children’s preference.
REFERENCES


http://nrs.harvard.edu/urn-3:HUL.InstRepos:3353824


Appendix I  Examples of various preverbal ㄍㄜ  patterns found in the Tardif corpus (1993)

(1) Verb

给 你 小 兔。 (File: hy1.cha, Line: 1919)

Gêi nǐ xiǎo tù.
give you little-rabbit

‘Give you the bunny (stuffed animal).’

(2) Benefactive

姐 姐 给 你 拿 真 羽 毛 球 呢。 (File: ll1.cha, Line: 1995)

Jiějie gêi nǐ ná zhēn yǔ máo qiú ou.
older sister GEI you bring real shuttlecock PRT

‘I will bring a real shuttlecock for (for your sake/intended for) you.’

(3) Malefactive

给 谁 搞 乱 啊? (File: ll5.cha, Line: 1773)

Gêi shéi dǎo luàn a?
GEI who make trouble PRT

‘To whom are you causing trouble?’

(4) Recipient

爸 爸 昨 天 给 宝 宝 打 电 话 没 有? (File: bb1.cha, Line: 675)

Bàba zuótiān gêi bāobao dǎ diànhuà méi yǒu ?
dad yesterday GEI baby make phone call yes or no

‘Did your dad call you yesterday?’

(5) Lessive

给 姨 吃 啊! (File: tt5.cha, Line: 2072)

Gêi a’yí chī a.
GEI aunty eat PRT

‘(You) let aunty eat (it).’

(6) Emphasis

我 给 忘 了。 (File: ww1.cha, Line: 1427)

Wǒ gêi wàng le.
I GEI forget PFV

‘I forgot it.’
(7) **Object marker =BA (disposal)**

Wǒ gěi shī dào le qù! I GEI feces dump PFV go ‘I go and dump the feces!’

(8) **Passive**

Jīn mǔ dōu gěi bāobao diū guāng le. building blocks all PASS baby lose-all PFV ‘Building blocks were all lost by the baby.’

(9) **Goal**

Lái, yéye gěi nǐ fāqiú! come grandpa GEI you pitch ball ‘Come here, I will pitch a ball to you!’

(10) **Idiomatic (imperative)**

Gěi wǒ huí lái! GEI I come-back ‘Come back!’
Appendix II  The critical test items and control items in the modified TVJT

I. lessive-matched items

Item 1

1. 鸭子得到了一支神奇的魔笔。用它画出来的东西都能变成真的。

Duck got a magic brush. Anything drawn with this brush would become real!

2. 象爸爸和象宝宝来了。象爸爸说：“鸭子呀，我能用你的魔笔画一副翅膀吗？我想飞！”鸭子说：“不行，不行，我可不愿意别人用我的魔笔。”象爸爸又问鸭子：“那你来画怎么样？”

Daddy Elephant and Baby Elephant came by.

Daddy Elephant: Hi, Duck! Can I draw a pair of wings with your magic brush? I want to fly!  
Duck: No way! I don’t want others to use my brush!  
Daddy Elephant: Well, then how about you drawing me some wings?

Daddy Elephant was very sad.

3. 鸭子说：“别开玩笑了！你需要一副大翅膀，那得花去我一整天的时间，我可不想画！”大象听了很失望。

Duck: Are you kidding me? You would need huge wings. I don’t want to spend my whole day on you!  
Daddy Elephant was very sad.

4. 象宝宝说：“鸭子啊，我的身体小，你来画我的翅膀怎么样？”鸭子说：“可以是可是，不过现在我得去参加一个冰淇淋晚会，顾不上啊。”象宝宝说：“那我来画吧！如果你同意，瞧，我刚好有一个冰淇淋，你拿去吧！”

Baby Elephant came up, “Duck, I am much smaller. Could you draw me some wings?”  
Duck was about to draw some wings, but he suddenly remembered an important thing.  
Duck: I could, but now I have to go to an ice cream party.  
Baby Elephant: Then can I draw some wings? If you agree, look! I just got this chocolate ice cream! It is yours!
Duck: I don’t really want others to use my brush. That is why I did not want your Daddy to draw wings. But…you are so nice… here you go. You can draw some wings!

Baby Elephant got the brush from the Duck and started drawing the wings.

**Experimenter’s question:**

鴨子給誰畫翅膀？
Yāzǐ gěi shuí huà chìbāng?
duck GEI who draw wing
‘For whom did Duck draw wings?’
‘Who did Duck let draw wings?’

**Puppet:**

象宝宝 Xiàng bāobao ‘Baby Elephant’

**Item 2**

1. 一天，兔哥哥捡到了一串鞭炮。他拿着鞭炮高兴地跑回了家。
Brother Rabbit found a string of firecrackers. He brought it home happily.


**Brother Rabbit:** Mommy, will you please light these firecrackers?
Mommy Rabbit was about to agree, but she remembered that she was not done cooking yet. “No, I have to make dinner!” Mommy Rabbit said.
Brother Rabbit cried, “Then can I go and light them?”
Mommy said impatiently, “Alright! I don’t want to hear you crying! You go and light them!”
3. Just then, Sister Rabbit came in. She saw the firecrackers and shouted, “I want to light them, Mommy!” Mommy said, “Sister, it was Brother who found them; besides, you are too young. It is too dangerous for you!"

Sister: Mommy, then you light them, I want to hear them, please!!!

Mommy: I am cooking! I cannot do it. Brother, go ahead!

Brother took the firecrackers and went out.

**Experimenter’s question:**

妈妈给谁点鞭炮?
Māma gěi shuí diǎn biānpào?
mommy GEI who light firecracker

‘For whom did Mommy light the firecrackers?’

‘Who did Mommy let light the firecrackers?’

**Puppet:** 哥哥 gēge ‘Brother’

**Item 3**

1. One day, Pony bought a kite.

2. On his way home, he ran into Goose.
Goose: Pony, your kite is really nice! I want to see it flying. Could you please fly it?
Pony: Sure, no problem.
Pony was about to fly the kite, but he thought it would be more fun if Goose flew it. Pony: Hey, Goose, you fly it!

Goose got the kite from Pony happily.

Lion happened to pass by. He saw the kite and shouted, “Wow, a kite! I am really good at flying kites. Little Goose can do nothing! I will fly it!” Pony was very angry. Pony said, “Lion, how come you are always so rude? You want to fly my kite? It is impossible!”

Lion: Then, could you fly it and I just look at how you fly it!
Pony: I only have one kite and Goose already took it away. How could I fly it?
Lion left in a huff.

Experimenter’s question:

小马给谁放风筝?
Xiāo mǎ gěi shuí fàng fēngzhēng?
little horse GEI who fly/set kite
‘For whom did Pony fly the kite?’
‘Who did Pony let fly the kite?’

Puppet: 小鹅 Xiǎo é ‘Goose’

II. Benefactive-matched items

Item 1

1. 老鼠大王偷了一桶牛奶。King Rat stole a big carton of milk.
2. 灰老鼠说：“大王呀，您的牛奶我能倒点几吗？”老鼠大王刚要同意，可是他想了想说：“不行，我知道你做事总是毛手毛脚，会洒了牛奶的，还是我来倒吧。”老鼠大王说着往灰老鼠的杯子里倒了一些牛奶。

Gray Rat: Your Majesty, could I pour some milk into my cup?
King Rat was about to agree, but he remembered that Gray Rat was very clumsy.

King Rat: No, Gray Rat, I don’t want you to spill my milk. You are very clumsy! I will pour it. King Rat filled up Gray Rat’s cup.

3. 蓝老鼠见了也赶紧拿起了他的杯子：“大王，请您也倒一些牛奶在我的杯子里吧！”老鼠大王说：“嘿，我是大王！我可不想伺候你们每一个人！”

Blue Rat could not wait, “My turn! Please pour some into my cup too!”

King Rat: Hey! I am the KING! I cannot serve all of you guys!

4. 蓝老鼠说：“那我也倒可以吗？”蓝老鼠刚要倒，可是大王忽然发现他的牛奶只剩下一点点儿了，他说：“不行，谁也不能倒我的牛奶了！”

Blue Rat: Then, can I pour the milk?
Blue Rat was about to pour the milk, but King Rat suddenly realized that his milk carton was almost empty. “Oh, no, nobody can have my milk!” King Rat said.

Experimenter’s question:
老鼠大王给谁倒牛奶?
Lāoshū dàwáng gěi shuí dào niúnái?
rat king GEI who pour milk
‘For whom did King Rat pour the milk?’
(benefactive reading)
‘Who did King Rat let pour the milk?’
(lessive reading)

Puppet:
灰老鼠 Huī lāoshū ‘Gray Rat’
(matched only on the benefactive reading)
Item 2

1. One day, it was snowing hard outside.

2. Xiaoyu really wanted to build a snowman. Xiaoyu asked Grandpa, “Can I build a snowman?”

Grandpa was going to agree, but he found it was extremely cold outside.

Grandpa: No, You must stay inside. I don’t want you to catch a cold. If you really want a snowman, I will go out to build one.

3. Grandpa went out and built a cute snowman.

Xiaoyu was very happy!

4. Luoluo saw the snowman and said, “It is so cute! Grandpa, can I go out and build another one?”

Grandpa: NO! I don’t want you to catch a cold.

Luoluo: Then could you please build another snowman? I want one too!

Grandpa: I could, but now it is my nap time, I have to lie down. I cannot build another one.

Grandpa went to take his nap.

Experimenter’s question:

爷爷给谁堆雪人？

Yéye géi shuí duī xuě rén?

grandpa GEI who build snowman
Puppet: 小雨 Xiàoyǔ ‘Xiaoyu’

Item 3

1. 一天，猴子和小青蛙一起过桥。不知怎么搞的，他们的鞋都掉进了河里！One day, Monkey and Frog were crossing the river. Somehow their shoes both fell off into the river!

2. 猴子的鞋正好砸在了大乌龟的壳上。大乌龟正在睡觉，他一下子醒了。

Monkey’s shoe hit Big Turtle’s shell, who was sleeping. Big Turtle woke up.

3. 猴子说：“大乌龟，对不起……那只鞋是我的，我可以去把它捡起来吗？”大乌龟刚要同意，可是他的背一下子疼了起来。大乌龟说：“不行，你砸了我，别想捡鞋！”小青蛙说：“我的鞋没有砸到你，我可以去捡我的鞋吗？”大乌龟说：“不行，这是我的地盘，谁也不能来！不过……你说得对，你的鞋并没有砸到我，好吧，我来把你的鞋捡起来！”大乌龟说着，捡起了青蛙的鞋。

Monkey: I am sorry… Turtle, that shoe is…mine…can I pick it up?
Turtle was going to agree, but his back really hurt.
Turtle: No way! Your shoe hit me! You cannot pick up your shoe!
Frog: Turtle, my shoe did not hit you. Can I pick up my shoe?
Turtle: No! This is my river! Nobody should come here! But…you are correct, Frog. Your shoe did not hit me…Alright, I will pick up your shoe!
Turtle picked up Frog’s shoe.

4. 小猴子又赶紧说：“大乌龟，你也顺便……把我的鞋捡起来吧！”大乌龟生气地说：“我的背现在还疼呢！我才不管你的鞋呢，快走开！”小猴子可伤心了。

Monkey: Turtle, could…could…you please pick up my shoe too?
Turtle: What?! My back still hurts! I won’t pick up your shoe! Go away!
Monkey was really sad.
**Experimenter’s question:**

鳥兎给谁捡鞋?

Wūguī gēi shuǐ jiǎn xié?

turtle GEI who pick up shoe

‘For whom did Turtle pick up the shoe?’

‘Who did Turtle let pick up the shoe?’

(benefactive reading)

(lessive reading)

**Puppet:** 青蛙 Qīngwā ‘Frog’

(matched only on the benefactive reading)

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**III. Control items**

**Item 1 of the lessive-matched scenario**

1. 熊爸爸进城买了一个号。

Daddy Bear went to town and bought a horn.

2. 熊妹妹说：“爸爸, 我想听号, 你吹一个吧！”熊爸爸刚想吹, 可是他发现

熊妈妈在睡觉, 就说: “熊妈妈正在睡觉呢, 我不想吵醒她。”熊妹妹很不高兴。

**Sister Bear:** Daddy, could you please play it? I would like to hear it!

Daddy Bear was about to play the horn, but he found that Mommy Bear was sleeping.

**Daddy Bear:** I could, but now your mommy is sleeping and I don’t want to wake her up.

Sister Bear was very unhappy.

3. 熊哥哥过来了, 他说: “爸爸, 你吹一个吧, 我真想听。我们可以去外面的

树林, 这样妈妈就听不到号了。”熊爸爸说: “我刚走了一天的路, 累死了, 我可不想再跑到外面去! 这样吧, 我同意你去吹, 反正你会吵到别

人。”熊哥哥一听可高兴了, 他刚拿起号, 熊妹妹就闹起来, “爸爸, 我

也要吹, 我也要吹。”可是爸爸说: “熊妹妹, 你哪儿会吹号啊! 你还没

学过呢! 熊哥哥快去吧!”熊哥哥拿着号去外面了。

**Brother Bear:** Daddy, could you play it? We can go to the woods. You play the

horn there, then mommy won’t hear the horn.

**Daddy Bear:** Nonsense, I don’t want to go outside to play the horn! I am so tired from walking home from the
town. But if you go outside, you won’t disturb anyone. Brother, I permit you to play the horn outside. Here it is!

But Sister Bear shouted, “Daddy, I also want to play the horn outside!”
**Daddy:** Can you? You have never learned how to play the horn! Stay home. Brother, go ahead!

Brother Bear took the horn out happily.

**Experimenter’s question:**

熊爸爸给谁吹号?

Xióng bāba gěi shuí chuī hào?

Bear daddy GEI who play/blow horn

‘For whom did Daddy Bear play the horn?’ (benefactive reading)

‘Who did Daddy Bear let play the horn?’ (lessive reading)

**Puppet:** 熊妹妹 Xióng mèimei ‘Sister Bear’ (mismatched)

**Item 2 of the benefactive-matched scenario**

1. 有一天，巨人、小矮人、小丑一起出去吃饭。

One day, Giant, Dwarf, and Clown went out for dinner.

2. 只有巨人要了鸡蛋。小矮人说：“巨人啊，你的鸡蛋看起来可真好吃，我夹一个行吗？”巨人说：“行是行……，可是你离得那么远，哪儿够得着啊，这样吧，我夹一个放在你的盘子里。”巨人夹了一个鸡蛋放在了小矮人的盘子里。

Only Giant ordered eggs.

**Dwarf:** Giant, those eggs look really delicious! Could I take one egg?

**Giant:** Alright…But you are too small. How can you reach the egg across the table? I will do it.

Giant picked up one egg and put it on Dwarf’s plate.

3. 小丑见了也赶忙递过盘子说：“请你也将我的盘子里夹一个。”巨人说：“嘿，小丑，你又不矮，你可以自己夹吗，我还要吃饭呢！”小丑刚要去夹，巨人发现盘子里只剩下一个鸡蛋了！他赶紧拦住了小丑说：“不行，不行，只剩下一个了……，你不能夹了；我是个大肚皮，我还没吃饱呢，鸡蛋都是我的！”

**Clown:** Giant, could you please also pick up one egg and put it on my plate?

**Giant:** What? You are not so short and you can reach the egg! Don’t interrupt me!
Clown was about to take one egg, but the Giant found that he only had one egg left!

**Giant:** Stop! see? Only one egg left…I have a big belly. I want to eat it!

**Experimenter’s question:**

巨人给谁夹鸡蛋?

Jùrén gěi shuí jiā jiādàn?

giant GEI who take egg

‘For whom did Giant take the egg?’  
‘Who did Giant let take the egg?’  

(benefactive reading)  
(lessive reading)

**Puppet:** 小丑 Xiāochou ‘Clown’  
(mismatched)
Appendix III  The filler items and the training items in the modified TVJT

I. Filler items

Filler item 1 (who-object question)

1. A tree had three big apples: a yellow apple, a green apple, and a red apple. They grew bigger and bigger. It was uncomfortable for them to hang on the branches.

2. Green Apple: “Ouch, my neck hurts! Hey, Red Apple, could you please give me a push? I really want to get down on the ground.” Red Apple said, “What? Give you a push? I also cannot wait to get down! No way!” Green Apple was very upset.

3. Yellow Apple: “Red Apple, stop shouting! I could push you, but you are so rude. I won’t push you. Green Apple, don’t be upset! I will give you a push.”

Yellow Apple stretched his arms hard toward Green Apple, and Green Apple fell down.

Experimenter’s question:

黄苹果推了谁？Who did Yellow Apple push?

Puppet:  
A. 绿苹果 Green Apple (matched)  
B. 红苹果 Red Apple (mismatched)
Filler item 2 (who-object question)

1. One day, Rooster told Hen, “I found lots of caterpillars on the riverside. They are very tasty. You can go there to get some.”

2. Chick happened to come home. Rooster was about to tell Chick about the secret.

3. However, Hen whispered to Rooster, “I also heard that recently a big snake came there. You’d better not tell Chick. She is too young. It is too dangerous for her to go over there.” So Rooster did not tell Chick about the caterpillars.

Experimenter’s question:

To whom did Rooster tell the secret?

Puppet:
A. Hen (matched)
B. Chick (mismatched)

Filler item 3 (who-object question)

1. Doggy made a melon car. Lots of animals came to look at it. Here came Turtle and Frog. They really wanted to drive the melon car.

2. Doggy said, “You two are good swimmers, but you can’t drive the melon car.”
But Doggy said, “Well, you two sure know how to swim, but I don’t think you know how to drive.” Turtle and Frog were upset and they argued, “How come other animals can drive it? Doggy, it is unfair!” Hearing this, Doggy was embarrassed. “Okay, …go ahead and drive it.”

3. 蛙一下了跳到了前面，他刚要上车，小狗忽然发现了蛙胳膊上的绷带。小狗连忙拦住了蛙说: “蛙，蛙，你的胳膊受伤了，你可不能开车，太危险了。乌龟，你去开吧！” 乌龟钻进了西瓜车里。

Frog hopped to the front. He was about to get in the car when Doggy suddenly saw the band-aid on Frog’s arm. “Stop, Frog! Your arm is broken! It is too dangerous for you to drive. Turtle, you go ahead and drive the car.” Turtle got in the car.

Experimenter’s question:

小狗拦住了谁？Who did Doggy finally stop?

Puppet: A. 青蛙 Frog (matched)
        B. 乌龟 Turtle (mismatched)

Filler item 4 (who-object question)

1. 秋天，大象的树上结了很多红红的大苹果。大象自己吃不了，所以他想请别的动物来摘苹果。

In the Fall, Elephant’s apple trees bore lots of red apples. He wanted to invite other animals to pick the apples since he could not eat up all of them.

2. 大象先想到了小狗，因为他知道小狗最喜欢吃红苹果了。Elephant planned to invite Doggy, because Elephant knew that Doggy really loved apples.
3. 小猫告诉大象：“小狗不爱惜花草，前几天他把我的花弄坏了，如果你请小狗摘苹果，他肯定会弄坏你的苹果树的。”

But Kitten told Elephant, “Doggy is very rough with plants. He broke my plants the other day! Doggy will ruin your apple trees if you have him there!”

4. 大象说：“是吗？嗯，这样的话，我可能请小狗来摘苹果了。小猫呀，你爱护花草，请你明天来我家摘苹果吧。”第二天，小猫去了大象家，她摘了很多苹果

Elephant: Really? Then I won’t invite Doggy to pick the apples. Kitten, please come over tomorrow since you really care for plants. I would like you to pick some apples.

Kitten went to Elephant’s yard the following day. She picked lots of apples.

Experimenter’s question:  
大象请谁摘苹果？Who did Elephant invite?

Puppet:  
A. 小猫 Kitten (matched)  
B. 小狗 Doggy (mismatched)

Filler item 5 (who-subject question)

1. 小熊得到了一些花种子。小熊的好朋友山羊来了。Bear had some seeds. Bear’s good friend Goat came.

2. 小熊的好朋友山羊来了。山羊问：“小熊，你的种子我能拿一些吗？”小熊说：“当然可以！你要是也在你的院子里种上花儿，那才好呢！”

Goat: Bear, Could I have some of your seeds?  
Bear: Sure. It would be nice if you grow some plants in your yard.
3. 老鼠听到了他们的话，跳出来喊道：“小熊，快把你的花种子都拿到我这儿来，我最会种花了！”Rat overheard their talking. She came out and shouted, “Bear, bring all of your seeds to me! I will grow them, and I have a green thumb!”

4. 小熊刚要同意，但是他想起来前几天老鼠偷了他的蜂蜜。小熊生气地说：“你还想拿我的花种子，前几天你偷走了我的蜜，哼，从现在起，我的什么东西你都别想拿走！”小熊说着把花种子递到山羊的手里。

Bear was about to agree, but he remembered that Rat stole his honey the other day. Bear said angrily, “I could give you some seeds. But the other day you stole my honey! I won’t give you anything from now on!” Bear handed the seeds to Goat.

**Experimenter’s question:**

谁得到了花种子？Who got Bear’s seeds?

**Puppet:**

A. 山羊 Goat (matched)

B. 老鼠 Rat (mismatched)

**Filler item 6 (who-subject question)**

1. 一天，小牛，小猪和小毛驴一起刷房子。One day, Cow, Pig, and Donkey painted their house together.

2. 小猪问小牛：“我能用你的蓝油漆刷我的小桌子吗？”小牛点点头说：“这是个好主意！你的桌子灰秃秃的不好看，你应该把它刷上漂亮的颜色！” Pig asked Cow, “Can I use your blue paint to paint my table?”

Cow nodded, “That is a good idea. Your table is gray. You should paint it in a prettier color!”

3. 小猪刚拎起油漆桶，一不小心，就把一些油漆洒在了地上！Pig was about to paint his table. But when Pig lifted the bucket, some paint was spilled on the floor!
4. 小牛说：“哎呀，快停下来，你在浪费我的油漆！你可不能刷桌子了。嘿，小毛驴，你很会刷，你来刷小猪的桌子怎么样？”小毛驴说：“我很愿意刷小猪的桌子，可是我自己的书架还没刷完呢！”小牛说：“看来只好我自己刷了。”说着小牛就刷了起来。

Cow: Gosh, stop! You are wasting my paint! You cannot paint the table. Hey, Donkey, you are good at this, will you please come here to paint Pig’s table?

Donkey: I would like to, but I am still working on my bookshelf. Cow: Okay, then I’ll have to paint Pig’s table.

Then, Cow started painting the table.

Experimenter’s question:

谁刷了小猪的桌子？Who painted Pig’s table?

Puppet: A. 小牛 Cow (matched)  
B. 小毛驴 Donkey (mismatched)

Filler item 7 (who-subject question)

1. 长颈鹿在一棵大树上发现了一个神奇的盒子。如果你感到不开心的事，一打开这个盒子，你就又会高兴起来了。

Giraffe found a magic box in a tree. If you feel bad, just open the magic box, and then you will be happy again.

2. 一天，小刺猬的自行车坏了，他很难过。小刺猬去找长颈鹿，他问长颈鹿能不能打开盒子，因为小刺猬太矮了，够不到盒子。长颈鹿说：“当然可以，我也想让你快点儿高兴起来。”长颈鹿刚要上大树那儿，忽然看见了桌子上的蛋糕。“哎呀，我差点儿忘了，我得去奶奶家送蛋糕。不能去开盒子！”

One day, Porcupine’s bike broke. He was so sad. He asked Giraffe if Giraffe could open the magic box, since he was too short to reach the box. Giraffe said, “Of course, I don’t want to see you so sad.” Giraffe was about to go, he suddenly saw the cake that he was supposed to deliver to Grandma.

Giraffe: Sorry, I have to deliver the cake. I cannot open the magic box.
3. Pony happened to drop by. Giraffe asked Pony if Pony could go instead and opened the box. Pony, “Sure, I am available!” Pony went to the tree and opened the box.

Experiment’s question:

谁打开了盒子？Who opened the music box?

**Puppet:**

A. 小马  Pony (matched)
B. 长颈鹿  Giraffe (mismatched)

**Filler item 8 (who-subject question)**

1. 今天是犀牛宝宝的生日。他想出来了一个好主意过生日。Today was Baby Unicorn’s birthday. He came up with a great idea to celebrate it.

2. 犀牛宝宝问妈妈：“妈妈，我能自己做一个大生日蛋糕吗？”妈妈笑了起来，说：“那真是太好了！”

He asked Mommy, “Can I make a big birthday cake myself?” Mommy smiled, “That’s great!”

3. 犀牛宝宝刚要倒面粉，可是就把面粉撒了一地。妈妈急地说：“快停下，你可不能这样做蛋糕。我说他爸爸呀，你快来，这个生日蛋糕还是你来做吧！”As Baby started dumping the flour, he spilled it all over the floor! Mommy was upset, “STOP! You cannot make a cake like this. Daddy! Come here! You make the cake!”

4. 爸爸说：“我本来愿意做蛋糕，可是我正好要出门。”妈妈叹了一口气说：“哎，好吧！看来蛋糕还是我来做吧！”妈妈说着开始做起蛋糕来。Daddy said, “Sorry, I could, but I am going out.” Mommy sighed, “Well okay, I have to make it.” Mommy started making the cake.
Experimenter’s question:

Who made the cake?

Puppet:  
A. 妈妈 Mommy (matched)  
B. 爸爸 Daddy (mismatched)

II. Training items

Item 1

1. 有一个夏天，没有下过一次雨。河都干了，只有小鹿家的一个神奇的池子里有水。

One summer, it didn’t rain. Only a mysterious pond in Deer’s yard was full of water.

2. 一天早上，鸭子到了小鹿家。她说： “小鹿，我能打水吗？” 小鹿


Duck was about to get water when Doggy also came to get water. Doggy saw Duck and became very angry.

Doggy: The other day when Duck got water, he swam in the pond and made it dirty!

Duck一听，赶紧拦住了鸭子说： “要是这样的话，鸭子你不要去打水了。小狗你去打水吧。” 小狗打满了水。 Hearing this, Deer stopped Duck quickly, “Oh, No! Duck, you cannot get water any more. Doggy, go ahead and get water.” Doggy filled his bucket with water.
Experimenter’s question:

谁打了水？Who got the water?

Puppet:  

A. 小狗 Doggy (matched)  

B. 鸭子 Duck (mismatched)

**Item 2**

1. 这个故事讲的是唐僧、孙悟空和猪八戒。This story is about Monkey King, Pig, and their Master.

2. 一天，他们正在赶路。猪八戒肚子饿了，他看见远处有一盘香喷喷的鸡。One day, they were on their journey. Pig was very hungry and he saw a plate of delicious chicken in the distance.

3. 猪八戒说: “猴哥呀，请你去把那盘鸡拿来好吗？老猪我快要饿死了。” 孙悟空说: “我才不去呢，我知道你的懒毛病又犯了。”

Pig: Monkey brother, could you please bring that plate of chicken here? I am so hungry. Monkey: I won’t go there. I know you are lazy.

4. 猪八戒又问师傅: “师傅啊，我肚子饿坏了，路都快要走不动了，您看见那盘鸡了吗？您把鸡拿来可以吗？”唐僧说: “我不能动肉，要去你自己去吧!” 猪八戒只好自己走过去拿鸡了。

Pig asked Master, “Master, I am so hungry and I can hardly move. Did you see that plate of chicken? Could you please bring it here?” Master: I am not supposed to touch meat. YOU have to go and get it. Pig had to go over there, and he got the chicken.

Experimenter’s question:

谁去拿鸡了？Who went to bring the chicken?

Puppet:  

A. 猪八戒 Pig (matched)  

B. 孙悟空 Monkey (mismatched)
Appendix IV  Individual data of the participants included in the final analyses in the modified TVJT

Key  0: non-target-like;  1: target-like

Children’s results

<p>| N 56 | age/gender | lessive item 1 draw wings | lessive item 2 light the firecracker | lessive item 3 fly the kite | lessive control play the horn | benefactive item 1 dump the milk | benefactive item 2 build the snowman | benefactive item 3 pick up the shoe | benefactive control pick up the egg | fillers (8) | accuracy |
|------|------------|---------------------------|-------------------------------------|-----------------------------|-------------------------------|----------------------------------|--------------------------------------|----------------------------------|----------------------------------|-------------|
| 01   | 5;8 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 02   | 5;8 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 03   | 5;8 M      | 1                         | 1                                   | 1                           | 0                             | 1                                | 1                                    | 1                                | 0                                |             |
| 04   | 5;6 M      | 0                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 07   | 5;6 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 08   | 5;6 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 09   | 5;5 M      | 1                         | 1                                   | 1                           | 0                             | 1                                | 1                                    | 1                                | 1                                |             |
| 10   | 5;5 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 11   | 5;5 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 12   | 5;4 F      | 1                         | 1                                   | 0                           | 1                             | 0                                | 1                                    | 1                                | 1                                |             |
| 15   | 5;4 F      | 0                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 16   | 5;3 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 18   | 5;2 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 19   | 5;1 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 21   | 5;1 M      | 1                         | 1                                   | 1                           | 1                             | 0                                | 1                                    | 1                                | 1                                |             |
| 22   | 5;0 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 23   | 5;0 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 24   | 5;0 F      | 1                         | 1                                   | 1                           | 1                             | 0                                | 1                                    | 1                                | 1                                |             |
| 26   | 4;10 M     | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 27   | 4;10 M     | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 28   | 4;10 M     | 0                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 29   | 4;9 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 30   | 4;9 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 32   | 4;6 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 33   | 4;6 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 34   | 4;6 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 36   | 4;5 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 37   | 4;5 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 39   | 4;4 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 40   | 4;4 F      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 41   | 4;3 M      | 1                         | 1                                   | 1                           | 0                             | 1                                | 1                                    | 1                                | 1                                |             |
| 42   | 4;3 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 43   | 4;3 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 44   | 4;3 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 46   | 4;2 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 47   | 4;2 F      | 0                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 50   | 4;1 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 51   | 4;1 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 52   | 4;1 F      | 0                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 53   | 4;1 M      | 1                         | 0                                   | 1                           | 0                             | 1                                | 1                                    | 1                                | 1                                |             |
| 54   | 4;0 M      | 1                         | 1                                   | 1                           | 0                             | 1                                | 1                                    | 1                                | 1                                |             |
| 55   | 4;0 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 57   | 3;11 M     | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 58   | 3;11 F     | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 59   | 3;11 F     | 1                         | 1                                   | 1                           | 0                             | 1                                | 1                                    | 1                                | 1                                |             |
| 61   | 3;11 M     | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 62   | 3;10 F     | 1                         | 1                                   | 0                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 63   | 3;9 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 64   | 3;8 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |
| 65   | 3;8 M      | 1                         | 1                                   | 1                           | 1                             | 1                                | 1                                    | 1                                | 1                                |             |</p>
<table>
<thead>
<tr>
<th>N</th>
<th>age /gender</th>
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Appendix V  Experimental results under grouping 3: 3-year-old child group, 4-year-old child group, 5-year-old child group, adolescent group, adult group

(1) child within-group differences

Graph A.1 shows that for all three child subgroups, the mean acceptability rate of the lessive-matched items is higher than that of the benefactive-matched items: the 3-year-old child group is 93% vs. 78%, the 4-year-old child group is 94% vs. 91%, and the 5-year-old child group is 95% vs. 91%.

Graph A.1  Within-group comparison: 3 yrs., 4 yrs., 5 yrs., adolescents, and adults

The paired T-test reveals that all the three child subgroups do not have significant within-group difference on these two conditions: the 3-year-old child group is $t (14) =1.98, p = .07$; the 4-year-old child group is $t (22)= .71, p = .49$; the 5-year-old child group is $t (17) =.81, p = .43$ (see Table A.1).
Table A.1
Within-group acceptability differences on the lessive and the benefactive conditions under grouping 3

<table>
<thead>
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<th>Grouping</th>
<th>Acceptability rate of the lessive reading</th>
<th>Acceptability rate of the benefactive reading</th>
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<td>Children- 3 years old</td>
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<td>Children- 4 years old</td>
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<td>.94(.13)</td>
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<td>Children- 5 years old</td>
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<td>.95(.13)</td>
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*: p < .05; **: p < .01; ***: p < .001

(2) child between-group differences

Graph A.2 shows that for the lessive-matched items, all three child subgroups’ acceptability rates are almost equally high, which is 93%, 94%, and 95% respectively; for the benefactive-matched items, 4- and 5-year-old subgroups’ acceptability rates are also high (both about 91%), but slightly lower than those of the lessive-matched items, and the 3-year-old child group is the lowest (78%).
T-tests reveal that there are no between-group differences among the child subgroups (see Table A.2).

**Table A.2**

*Between-group acceptability differences on the lessive and the benefactive conditions under grouping 3*

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Statistics : Mean (SD)</th>
<th>F</th>
<th>p-value</th>
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<td>b. Children-4 yr (n=23)</td>
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<td>.91(.18)</td>
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<td>c. Children-5 yr (n=18)</td>
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<td>d. Adolescents (n=9)</td>
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<td>e. Adults (n=74)</td>
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*: p < .05; **: p < .01; ***: p < .001