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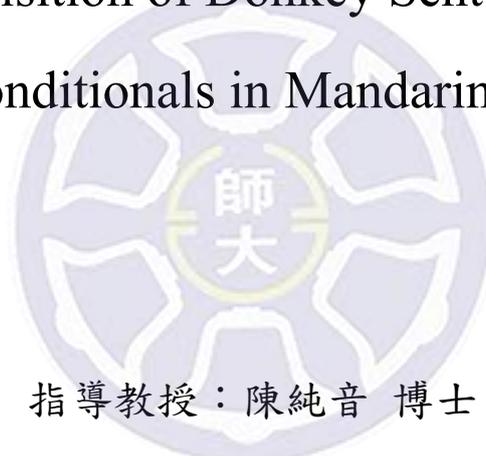
Master's Thesis

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中文驢子句與光桿條件句之第一語言習得

L1 Acquisition of Donkey Sentences and  
Bare Conditionals in Mandarin Chinese



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## 摘要

本研究旨在探討，中文為母語之兒童對於量化相關句構之詮釋與發展。探討內容為兒童第一語言習得之過程中，對中文驢子句與光桿條件句詮釋的差異，以及影響其詮釋之因素。本研究包含兩階段的詮釋測驗：第一階段是單句測驗，觀察兒童對量化相關句構之理解差異；第二階段則是加入語境，用以了解兒童是否會因而影響其解讀。研究對象依年齡與年級共分為四組：幼兒園大班、小學二年級、四年級、成人，每組皆為十八人。

研究結果顯示，該兩種句構的詮釋隨著年齡的增長，解讀能力逐漸與成人之詮釋一致。首先，對於這兩種句構的比較，每組兒童皆能在解讀上，顯示兩種句構並無相關性，而在這兩種句構的解讀方面，越高年級越能掌握到其意涵。在驢子句裡，量化詞對解讀有深遠的影響，但各個量化詞影響語句詮釋有不同的趨勢：「每」的意涵最為明確，因此每組孩童皆能容易解讀其語句；「不是每個」對於幼兒園大班尚有難度，但小學二年級、四年級孩童已能有成人解讀能力；「有些」所表達的意涵最為模糊，實驗所收錄之孩童，在解讀上尚未完全成熟。另外，光桿條件句則是測試句構之對等性對解讀之影響，實驗結果顯示，每組皆在對等條件句上表現較佳，且皆在對等結構上和成人有相近的解讀能力；但在不對等條件句上，只有小學二年級、四年級才有和成人一樣的解讀能力。最後，探討語境的加入是否影響兒童對於此兩種句構上的解讀，實驗結果顯示，除了幼兒園大班對於語境加入並無太大差異外，其他組皆在語句之詮釋上，有著顯著的影響。國小二年級已可以詮釋在偏置語境下的驢子句，而國小四年級則可以完全解讀支持語境與偏置語境下的驢子句，及支持語境下的光桿條件句。

關鍵詞：驢子句、光桿條件句、第一語言習得、量化詞、中文

## ABSTRACT

The present study investigated children's first language acquisition of donkey sentences and bare conditionals in Mandarin Chinese, which are both concerned with quantification. Aiming to discover a developmental pattern of acquisition, this study explored children's knowledge of quantification and how each construction affects their readings by testing their interpretations of the two constructions from an empirical perspective. Four issues regarding the two constructions were taken into account, which were the construction-related factor, construction-specific factors, contextual effects, and age effects. Kindergarten, Grade 2 and Grade 4 were recruited as experimental groups, and adults as a control group to compare their interpretations, each of which consisted of eighteen subjects. Every subject finished two phases of tasks, which were sentences in isolation and sentences in context. In both phases of the experiments, the subjects were asked to determine which picture best described the target sentence to test their interpretation, a universal or existential reading.

The results of this research identified a developmental pattern of the acquisition of donkey sentences and bare conditionals in Mandarin Chinese. It was found that overall, children under seven years old had difficulty interpreting quantificational sentences. First, concerning the relatedness of the two constructions, all the four groups showed a unanimous tendency in that bare conditionals were not in the same vein to donkey sentences in terms of interpretations where the latter was easier to interpret. In addition, quantifier types of donkey sentences are

vital to interpretations, where the quantifier *mei* ‘every’ was already acquired by children as young as KS, *bushi meige* ‘not every’ was interpreted in an adult-like manner by Grade 2, and *youxie* ‘some’ could not be obtained with an adult-like interpretation by any child group. This showed that *mei* ‘every’ was the easiest to acquire, followed by *bushi meige* ‘not every’ and lastly *youxie* ‘some.’ Another construction-specific factor, parallelism, was identified crucial to readings where all the child groups exhibited adult-like interpretations of parallel bare conditionals, but only Grade 2 and Grade 4 could have interpretations in an adult-like manner of nonparallel ones. This indicated that nonparallel sentences were more challenging to interpret than nonparallel ones. Moreover, with respect to contextual effects, children by the stage of Grade 2 could obtain adult-like interpretations of donkey sentences in biasing context, but it was not until they were at Grade 4 could they interpret both donkey sentences and bare conditionals in supporting context with adult-like readings. As a result, contextual effects were found, and the subjects’ interpretations were greatly affected by context but in different ways to the two constructions.

Keywords: donkey sentences, bare conditionals, first language acquisition, quantification,

Mandarin Chinese

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# Chapter One

## Introduction

### 1.1 Motivation

When it comes to first language acquisition, the innateness hypothesis (Chomsky 1986, Cook 1988, Gopnik 1988, Keil 1989, Gelman & Wellman 1991, Gopnik & Meltzoff 1997) is one of the most crucial theories to date. This hypothesis argues that children are born with some knowledge or principles of language where children can process and acquire a language in a short period of time. Nevertheless, not all linguistic knowledge is perceived at the same time. It has been found that children can comprehend some knowledge easier and faster, and they learn other language devices on the basis of those easier ones. In other words, there is a sequence in mastering language, and acquisition of quantification is one of the cases that can be probed into.

In the process of acquisition, it has been found that children had difficulties in comprehending quantificational sentences (Herburger 1997, Cohen 2001, Geurts 2003). For example, for a sentence, like “Every kid holds an umbrella,” children tend to interpret the sentence as “Every umbrella-holder is a kid.” A donkey construction, which gets its name by its pattern of construction, is one of the important constructions concerning quantification.

(1) Every farmer who owns a donkey beats it. (Geurts 2002:129)

Sentence (1), where the pronoun *it* refers back to the antecedent *a donkey*, can be interpreted

as “Every farmer who owns a donkey beats *at least one* of the donkeys that he has,” indicating there is at least one donkey in the universe involved; hence, it is an existential reading of the sentence. On the other hand, (1) can also be interpreted as “Every farmer who owns a donkey beats *all* of the donkeys that he has,” implying all of the donkeys are involved, yielding a universal reading. Both readings for (1) are reasonable, but it has been found that speakers tend to have a preference for a certain reading. For example, if a sentence is headed by a universal quantifier, like *every*, a universal reading is more likely to be favored, but if it is headed by an existential quantifier, like *some*, an existential reading tends to be chosen (Kanazawa 1994, Geurts 2002, Foppolo 2009).

Like donkey sentences, Chinese conditional sentences as shown in (2)-(4) are also concerned with an interplay of logic between quantifiers and variable pronouns:

(2) *Shei* xian lai, *shei* xian chi.  
 who come first who first eat  
 ‘If X comes first, X eats first.’ (Cheng & Huang 1996:127)

(3) **Ruguo** you shei quiao men, ni jiu jiao ta jin-lai.  
 if have who knock door you then ask him(her) come-in  
 ‘If someone knocks on the door, you’ll ask him/her to come in.’ (Cheng & Huang 1996:142)

(4) Ni jiao *shei* jin-lai, wo **dou** jian ta.  
 you ask who come-in I all see him(her)  
 ‘Whoever you ask to come in, I will see him/her.’ (Cheng & Huang 1996:142)

Sentence (2), an example of a bare conditional, is different from ordinary conditional sentences such as (3) and (4) in that neither a conjunction like *ruguo* ‘if’ in the antecedent clause as in (3)

nor an adverb like *dou* ‘all’ in the consequent clause as in (4) is present. As seen in (2), the variable, the *wh*-word *shei* ‘who,’ in the antecedent clause, *Shei xian lai* ‘who comes first,’ is connected to *shei* ‘who’ in the consequent clause *shei xian chi* ‘who eats first,’ meaning that whoever comes first, he (she) eats first.

There have been debates over whether Chinese bare conditionals can be regarded as one type of donkey sentences (Cheng & Huang 1996, Pan & Jiang 1997, Cheung 2007, Wang 2007) because the two constructions share referentiality in readings in common. In a donkey sentence like (1), the pronoun *it* refers back to the number of donkeys in the antecedent, and the sentence can obtain either an existential or a universal reading. In bare conditionals, as in (2), *shei* ‘who’ in the consequent clause refers back to *shei* ‘who’ in the antecedent clause. In other words, if *shei* ‘who’ is referred to *Zhangsan* in the antecedent clause, then *shei* ‘who’ in the consequent clause will be identical, and *shei* ‘who’ can be interpreted as “someone” or “everyone” with the sentence taking either an existential or a universal reading. Hence, through a comparison of readings (universal and existential readings) in the two constructions, the researcher would like to see whether and to what extent the two constructions are related.

In addition, construction-specific factors will be examined in the present study. For example, for donkey sentences, **quantifier types**, which elicit different readings, are taken as one crucial factor in determining the readings of donkey sentences, as in (5)<sup>1</sup>.

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<sup>1</sup> Examples in (5) are taken from Krifka (1996:2), but some modification has been made in order to exhibit contrasting quantifiers.

- (5) a. **Every** farmer who owns a donkey beats it. (universal reading)  
b. **Some** farmer who owns a donkey beats it. (existential reading) (Krifka 1996:2)

For (5a), it is believed that the universal quantifier *every* entails a universal reading of the sentence, while for (5b), the existential quantifier *some* elicits an existential reading; hence, this study probed into whether different quantifiers will influence different readings. Construction-specific factors that are influential to interpretations of donkey sentences and bare conditionals respectively are put in design in each construction to see whether the results can support analysis from previous studies.

Moreover, according to Prévost & Paradis (2004), Foppolo (2009), and Ileri et al. (2012), context can affect interpretations of sentences involving the syntax-semantic interface. Since it has been found that children depend on context to infer meanings of sentences, context is believed to be influential to interpretations of quantification as well. Accordingly, the contextual effects on the two constructions will be discussed in this study.

Furthermore, age has been a crucial issue in first language acquisition research (Assink, van Well & Knuijt 2003, Mayberry 2007). Hence, this study will also discuss this issue in order to see if there is a derivational pattern of acquisition in quantification of donkey sentences and bare conditionals.

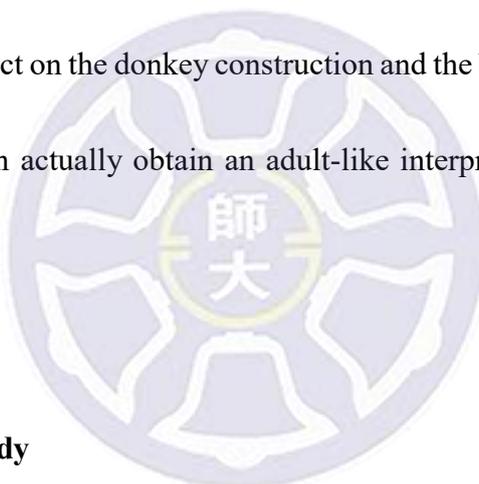
Since little literature (Crain et al. 2009) is concerned with L1 acquisition of donkey sentences and bare conditionals, through a comparison of children's and adults' interpretations of these sentences, the present study aims to provide clues to the relatedness of the two

constructions, and to the factors that may influence readings.

## 1.2 Research Questions

In order to investigate whether theoretical approaches are really the mechanism operating in children's acquisition, the researcher will explore the following research questions:

- 1) Are bare conditionals related to donkey sentences in readings?
- 2) Do construction-specific factors show significant impacts on readings of donkey sentences and bare conditionals?
- 3) Is there a contextual effect on the donkey construction and the bare conditional construction?
- 4) At what age do children actually obtain an adult-like interpretation of donkey sentences and bare conditionals?



## 1.3 Significance of the Study

Previous studies (Kanazawa 1994, Cheng & Huang 1996, Krifka 1996, Pan & Jiang 1997, Cheung 2007, Wang 2007) have provided some generalizations and analyses of the interpretations of English donkey sentences and of Chinese bare conditionals respectively. Nevertheless, little literature (Crain et al. 2009) is concerned with empirical research on Chinese donkey sentences and bare conditionals, and exploring the relatedness in readings of the two constructions.

In addition to the innovation of conducting an empirical study of the two constructions,

factors that are not regarded as influential in the literature (Yoon 1994, Krifka 1996, Foppolo 2009, Geurts 2002) are also taken into consideration. Construction-specific factors (such as quantifier types) are included respectively to test whether generalizations and analyses from previous studies can be supported or not. Therefore, this study hopes to offer some insights not only into the developmental pattern of quantification in the two constructions, but also into the relation between the two constructions and properties specific to each construction that literature has not yet been agreed upon.

#### **1.4 Organization of the Thesis**

The organization of the following chapters is as follows: Chapter Two discusses the theoretical literature concerning conditionals in Mandarin Chinese, which are analyses arguing whether Chinese conditionals could be regarded as one type of donkey sentences, and also empirical studies with respect to donkey sentences, which are concerned with interpretations of donkey pronouns. In addition, Chapter Three presents the research design, providing the recruitment of subjects, materials, procedures of the experiments. Chapter Four reports the results of the experiments, and discusses the analysis of children's acquisition of the two constructions. Lastly, Chapter Five concludes this study with a presentation of the major findings and suggestions for future research.

## Chapter Two

### Literature Review

This chapter provides a review of both theoretical and empirical literature. In order to investigate the relatedness of the donkey construction and the bare conditional construction and to discuss some construction-specific constraints of each construction, theoretical studies are discussed by issues (i.e. the relatedness of the two constructions and the construction-specific factors), while empirical studies are presented in chronological order. Accordingly, Section 2.1 discusses a construction-related constraint on quantification and readings of the two constructions, and Section 2.2 presents two construction-specific constraints affecting readings of donkey sentences and bare conditionals. Section 2.3 reviews empirical studies, and finally, Section 2.4 summarizes this chapter.

#### 2.1 Relatedness of Donkey Sentences and Bare Conditionals

With respect to the relatedness of donkey sentences and bare conditionals, some argue that the two constructions are related (Cheng & Huang 1996, Pan & Jiang 1997) while some deny the relatedness (Wang 2007). In an English donkey sentence like (1), two approaches are employed to explain the donkey pronoun *it*, which is anaphoric to *a donkey*.

(1) Every farmer who owns a donkey beats it. (Geurts 2002:129)

The first approach considers *it* to be an E-type pronoun where “E” stands for

“existential,” meaning the pronoun *it* expresses an existential property of the antecedent *a donkey*, yielding a meaning that at least one of the donkeys (but not necessarily all the donkeys) owned by a farmer is beaten by him.

The other approach is the unselective binding approach, which indicates the existence of an implicit operator (called the necessity operator, NEC) that unselectively binds two anaphoric nouns (*it* and *a donkey*). This operator serves as a binder and licenser that not only binds the two variables in the sentence and also licenses a quantificational force for the variables, as can be seen in (2).

(2) NEC [x, y] [farmer(x) and donkey(y) and own(x, y)  $\rightarrow$  beat(x, y)] (Pan & Jiang 1997:9)<sup>1</sup>

Hence, under this approach, for (1), both the pronoun *it* and the antecedent *a donkey* are bound by the operator (NEC), which is the quantifier *every* that gives quantificational force of the variables. Therefore, the operator binding results in ambiguity in readings: an existential reading (i.e., for a farmer who has a donkey, there exists at least one donkey that is beaten by him) and a universal reading (i.e., for a farmer who has a donkey, all of the donkeys are beaten by him).

The above two approaches to donkey sentences have been argued by Cheng & Huang (1996) to account for conditionals in Mandarin Chinese. To them, bare conditionals are one group of conditionals interpreted through the unselective binding approach, and other

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<sup>1</sup> The formula is taken from Pan & Jiang (1997:9) but with slight changes to fit in sentence (1).

conditionals are the other group<sup>2</sup> interpreted through the E-type pronoun approach. The approaches are selected through whether or not there is a *wh*-word in the consequent clause of a conditional sentence. For bare conditionals, which are by principle that no overt elements like *ruguo* ‘if’ or *dou* ‘all’ appear in the clauses, they can only take a *wh*-word in the consequent clause anaphoric to the *wh*-word in the antecedent clause, as illustrated below:

- (3) *Ni xihuan shei, wo jiu piping shei/\*ta/ \*[e]/ \*na-ge-ren.*  
 you like who I then criticize who/ (s)he/ [e]/ that-CL-person  
 ‘If you like X, I then criticize X.’ (Cheng & Huang 1996:128)

Hence, in a bare conditional like (3), only *shei* ‘who,’ but not a pronoun *ta* ‘he(he),’ an empty category, or a definite noun phrase *na-ge-ren* ‘that-CL person’ can appear in the consequent clause.

Based on this fact of bare conditionals, Cheng & Huang argue that they can be analyzed by the unselective binding approach since the two *wh*-words in the antecedent and the consequent clauses are both bound by the necessity operator. With the adoption of the unselective binding approach, the readings of bare conditionals are proposed to be universal

<sup>2</sup> The two paradigms are bare conditionals as one group and *ruguo*- and *dou*-conditionals as the other group. Bare conditionals can only take a *wh*-word in the consequent clause, while *ruguo*- and *dou*-conditionals can allow either an overt or covert pronoun in the consequent clause but not a *wh*-word, as shown in (i) and (ii):

- (i) *Ruguo ni kandao shei, qing jiao \*shei/ ta/ [e]/ na-ge-ren*  
 if you see who please tell who/ him(her)/ [e]/ that-CL-person  
*lai jian wo.*  
 come see me  
 ‘If you see someone, please ask that person to come see me.’ (Cheng & Huang 1996:131)
- (ii) *Ni jiao shei jin-lai, wo dou jian \*shei/ ta/ [e]/ na-ge-ren.*  
 you ask who enter I all see who/ him(her)/ [e]/ that-CL-person  
 ‘Whoever you ask to come in, I’ll see him/her.’ (Cheng & Huang 1996:130)

It is proposed by Cheng & Huang that the two types of conditionals are in complementary distribution where bare conditionals adopt the unselective binding to interpret their references while the other two conditionals take the E-type pronoun approach. Nevertheless, the researcher does not find it ungrammatical with the use of *wh*-words in the consequent clause, and hence, is not convinced of this dichotomy.

readings. Accordingly, they believe that since the approaches adopted to analyze donkey sentences are also available to analyze bare conditionals, the two constructions are related.

Following Cheng & Huang (1996), Pan & Jiang (1997) also deem bare conditionals to be one type of donkey sentences<sup>3</sup>. To them, like donkey sentences, bare conditionals exhibit anaphoric properties. In addition, the approaches to analyzing donkey sentences can be taken to analyze bare conditionals as well. Hence, Cheng & Huang and Pan & Jiang believe that the two constructions are related.

However, Wang (2007) disagrees with the idea of the relatedness of donkey sentences and bare conditionals. It is proposed by Wang that a bare conditional is actually one kind of relative clause sentences with identical *wh*-words anaphoric to each other where the first clause takes the role of a relative clause and the second clause is a matrix clause, as in (4), extracted from Wang (2007:71):

- (4) a. *Sheme pianyi, ta mai sheme.*  
       what cheap he/she buy what  
       b. *Pianyi de dongxi ta dou mai.*  
       cheap DE thing he/she all buy  
       ‘He(She) buys anything that is cheap.’

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<sup>3</sup> Although Pan & Jiang (1997) also state that conditionals are related to donkey sentences, they argue that both bare conditionals and *ruguo*- and *dou*-conditionals can take either overt pronouns or *wh*-words in the consequent clause, and the two approaches can both be adopted to analyze the conditionals. Hence, they claim that there is no such a complementary distribution of conditionals that Cheng & Huang (1996) have proposed.

According to Pan & Jiang, the adoption of different approaches renders different readings of conditionals. The E-type pronoun approach imposes the sentence an indication that there is only one individual or entity to make the proposition tenable, while the unselective binding approach offers a universal reading. The following are readings for “*Shei xian lai, shei/tu xian chi*” adopted with the unselective binding approach, as stated in (i), and with the E-type pronoun approach, as in (ii), both of which are taken from Pan & Jiang (1997:13).

(i) NEC [x] [come(x) first] [eat (x) first] (universal reading)  
 (ii) a. NEC [x, s] [come(x) first in s] [eat(x) first in s] (existential reading)  
       b. NEC [s] [∃x come(x) first in s] [eat(he/ she) first in s] (existential reading)

In (4a), the first *wh*-word *sheme* ‘what’ is considered to be a relative pronoun while the second behaves like the head of the relative clause. Examples (4a) and (4b) denote the same meaning, “He will buy anything that is cheap.”

In addition, Wang argues that only the first *wh*-word helps to trigger a universal reading (i.e., *sheme pianyi* ‘anything cheap’) while the second is only a component anaphoric to the first one (i.e., the head *sheme* ‘what’ anaphoric to *sheme pianyi*). The differences between the two *wh*-words can also be found phonetically. It is claimed that only the first *wh*-word can be stressed in the sentence whereas the second clause often occurs with *dou* ‘all’ as shown in (4b).

All in all, of these three previous studies, two of them have argued in favor of the relatedness of donkey sentences and bare conditionals (Cheng & Huang 1996, Pan & Jiang 1997), and the other has argued against such an analysis (Wang 2007). Hence, the present study attempts to find out whether or not the two constructions are related by investigating the readings of these sentences.

## **2.2 Constraints on Interpretations of Donkey Sentences and Bare Conditionals**

In this section, issues concerning two constraints on interpretations of donkey sentences and bare conditionals are discussed. Based on the issues regarding these constraints, what previous theoretical studies have proposed are presented. Section 2.2.1 introduces the first constraint, quantifier types, and Section 2.2.2 presents the second, parallelism.

### 2.2.1 Quantifier Types

According to both Rooth (1987) and Kanazawa (1994), the entailing properties of quantifiers elicit different readings of donkey sentences. Kanazawa's Generalization (1994) states that a universal quantifier entails a universal reading of the sentence while an existential quantifier leads to an existential reading. Rooth (1987), however, presents a contrasting generalization against Kanazawa's. For example, in (5a), the quantifier *every* is a universal or upward-entailing quantifier; on the other hand, in (5b), *some* is an existential or downward-entailing quantifier.

- (5) a. Every farmer who owns a donkey beats it.  
b. Some farmer who owns a donkey beats it. (Krifka 1996:2)

Under Kanazawa's Generalization, (5a) yields a universal reading (i.e., every farmer beats every donkey he has) because of the universal quantifier *every*, and (5b) an existential reading (i.e., a farmer beats at least one of the donkeys he/she owns, but not all the donkeys) because of the existential quantifier *some*. However, Rooth's Generalization argues in a reverse pattern where the upward-entailing quantifier *every*, as in (5a), elicits an existential reading and the downward-entailing quantifier *some*, as in (5b), leads to a universal reading.

Even though these two generalizations diverge in interpretations, they both have their supporters in literature. For example, Krifka (1996) supports Rooth's Generalization, while Geurts (2002) and Foppolo (2009) root for Kanazawa's Generalization. Nevertheless, quantifier types remain a considerable factor which is believed to be the very first possible

one to affect readings. Hence, this study aims to discover the effect of quantifier types on Chinese donkey sentences.

### 2.2.2 Parallelism

Parallelism refers to a phenomenon in bare conditionals where Cheng & Huang (1996) propose that a *wh*-word in the antecedent clause should have a parallel *wh*-word in the consequent clause, as shown below.

- (6) Shei xian lai, shei/\*ta/ \*[e]/ \*na-ge-ren xian chi.  
 who come first who/ (s)he/ [e]/ that-CL-person first eat  
 ‘If X comes first, X eats first.’ (Cheng & Huang 1996:127)
- (7) Ni xihuan shei, wo jiu piping shei/\*ta/ \*[e]/ \*na-ge-ren.  
 you like who I then criticize who/ (s)he/ [e]/ that-CL-person  
 ‘If you like X, I then criticize X.’ (Cheng & Huang 1996:128)

In (6) and (7), a pronoun, an empty category or a definite noun phrase cannot occur in the consequent clause of bare conditionals. According to Cheng & Huang, only *shei* ‘who’ can appear in the antecedent clause and another *shei* in the consequent clause.

Two opposite voices arise concerning this parallelism constraint on bare conditionals. Cheng & Huang (1996) are those who propose such an analysis of bare conditionals, but other studies (Pan & Jiang 1997, Cheung 2007, Wang 2007) disagree with this constraint.

Cheng & Huang (1996) state that taking a *wh*-word or not in the consequent clause is the way to distinguish bare conditionals from other conditionals. Hence, as in (6) and (7), they argue that in the consequent clause, *shei* ‘who’ is more grammatical than other forms of NPs.

Also, they adopt the Parallelism Constraint on Operator Binding (PCOB) to support their analysis of bare conditionals. The PCOB is a constraint which illustrates that for  $x$  and  $y$  which are both variables bound by the same operator,  $x$  and  $y$  must be phonetically realized, and the variables must be identical. Hence, sentence (6) and (7) can be interpreted as in (8) and (9) respectively, where the two  $x$ -s in both clauses should be phonetically pronounced and are *wh*-words:

(8)  $NEC_x$  [ $x$  comes first] [ $x$  eats first] (Cheng & Huang 1996:135)

(9)  $NEC_x$  [you likes  $x$ ] [I criticize  $x$ ]

Such anaphoric *wh*-words can be analyzed by the unselective binding approach, where the two *wh*-words are bound together by the same necessity operator, NEC, as shown in (8) and (9).

Nevertheless, disagreements concerning the parallel *wh*-words occur (Pan & Jiang 1997, Cheung 2007, Wang 2007). Pan & Jiang (1997) and Wang (2007) argue that bare conditionals with pronouns, empty categories, or definite noun phrases substituting *wh*-words in the consequent clause are not as ill-formed as Cheng & Huang have stated. They argue that in bare conditionals, either a *wh*-word or a pronoun can occur in their consequent clause, as in sentence (10).

(10) *Shei* bu dui, wo jiu shuo **shei/ta** bu dui.  
 who not correct I then say who/he/she not correct  
 ‘Whoever is incorrect, I will then say he/she is incorrect.’ (Wang 2007:71)

As seen in (10), both *shei* ‘who’ and *ta* ‘he/she’ can be present in the consequent clause.

Consequently, against Cheng & Huang's (1996) analysis, Pan & Jiang and Wang argue that the necessity of taking a *wh*-word only for bare conditionals is problematic and hardly relevant to natural language.

Moreover, Cheung (2007) offers another counterexample against Cheng & Huang's parallelism. Cheung (2007) explores a syntactic and semantic analysis of bare conditionals in Mandarin Chinese and argues that the *wh*-word in the consequent clause as in (11a) can be omitted, and the number of the *wh*-words can be inconsistent as in (11b). Both examples are taken from Cheung (2007:151).

- (11) a. Shei xiang qu Beijing, [e] qing<sup>4</sup> dao wo zheli baodao.  
 who want go Beijing [e] please to me here register  
 'If X wants to go to Beijing, please register with me.'
- b. Shei xihuan shei, shei yinggai shuo chulai.  
 who like who who should say out  
 'If X likes Y, X should voice out.'

Hence, Cheung argues that the unselective binding approach to analyzing bare conditionals is with flaws, and such flaws come from Cheng & Huang's parallelism constraint, the Parallelism Constraint on Operator Binding (PCOB).

For example, since the PCOB only constrains the *wh*-words to be parallel in the antecedent and consequent clauses, a phenomenon where *wh*-words are in islands<sup>5</sup> or

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<sup>4</sup> The original gloss for *qing* in Cheung (2007:151) was 'must,' but the researcher considered it more appropriate to translate *qing* into 'please.'

<sup>5</sup> An island refers to a constituent where phrases and their features that stay inside this island cannot move out of it. As in (12a), in principle, the first *shei* 'who' in the antecedent clause should be anaphoric to the second one in the consequent clause, yet the first *shei* 'who' is in a *wh*-island, that is, an island headed by a *wh*-word; hence, referentiality is blocked by this island.

coordinate structures is excluded since they block the binding of *wh*-words, as shown in (12a).

- (12) a. ??Zhangsan xiangxin [*shei* tou-le qian de shuofa], Lisi jiu  
 Zhangsan believe who steal-LE money DE rumor Lisi then  
 qu daibu *shei*.  
 go arrest who  
 Intended: ‘If Zhangsan believes in the rumor that X has stolen the money, then Lisi will arrest X.’ (Cheung 2007:153)
- b. Zhangsan xiangxin [*shei* tou-le qian de shuofa], Lisi jiu  
 Zhangsan believe who steal-LE money DE rumor Lisi then  
 xiangxin [ *shei* tou-le qian de shuofa/xiaoxi].  
 believe who steal-LE money DE rumor/news  
 ‘If Zhangsan believes in the rumor that X has stolen the money, then Lisi will believes in the rumor/news that X has stolen the money’ (Cheung 2007:154)

Cheung argues that the unselective binding approach fails to explain the above sentences and proposes that it is essential for *wh*-words to occur in the position (either subject or object) in the antecedent clause identical and parallel to that position in the consequent clause of an island or a coordinate structure<sup>6</sup>.

Overall, concerning parallelism of *wh*-words in bare conditionals, although Cheng & Huang (1996) offer a solid analysis (i.e., parallelism), three out of the four theoretical studies

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<sup>6</sup> Cheung states that the sideward movement is an approach that can solve the situations where the unselective binding approach fails to explain (i.e. unbalanced number of *wh*-words and *wh*-words in islands or coordinate structures). It is proposed that sideward movement is licensed by theta-role assignment and the parallelism constraint. In order to fulfill the requirement of the theta-role, the sideward movement would apply to the vacuous position that needs theta-role assignment. Also constrained by the Parallelism Constraint, the movement of the *wh*-expressions must be identical in form; therefore, it is the whole form that undergoes *Copy* and *Merge* with the mechanism of sideward movement. The following example is taken from Cheung (2007:157).

(i) *Shei* jinlai, wo da *shei*.  
 who enter I hit who  
 ‘If X comes in, I hit X.’

In order to satisfy the theta-role requirement, *shei* ‘who’ merges with the transitive verb *da* ‘hit,’ and because *jinlai* ‘enter’ is an intransitive verb that lacks a subject, undergoing *Copy* of *shei* and *Merge* with *jinlai*, it forms a grammatical sentence like (i).

on bare conditionals provide counterexamples (Pan & Jiang 1997, Cheung 2007, Wang 2007) showing problems of Cheng & Huang's analysis. Since previous studies focus on a theoretical aspect of parallelism, this study aims to probe into this factor to see which side of analysis can be supported from an empirical aspect.

## **2.3 Empirical Studies**

In this section, due to the lack of empirical studies on Chinese bare conditionals, only empirical English studies on the interpretations of donkey pronouns in donkey sentences are reviewed. Moreover, since there is no empirical research working on Chinese donkey sentences, English donkey sentences are examined instead, and the three studies that are reviewed are shown in chronological order (Geurts 2002, Foppolo 2009, Grosz et al. 2014).

### **2.3.1 Geurts (2002)**

Geurts (2002) aimed to illustrate the interplay between quantifiers and world knowledge through an experiment, and objected to the strong claim of judging the interpretations of donkey pronouns as a direct and arbitrary relation with quantifiers. Geurts argues that a quantifier and world knowledge would influence the choice of a preferred interpretation. It is proposed by Geurts that weak determiners trigger an existential reading and universal determiners, a universal reading, but that universal determiners might also generate an

existential reading.

Subjects of the experiment were twenty native Dutch speakers who were recruited to interpret 24 test items of Dutch donkey sentences along with 75 fillers. Since there is no difference in English and Dutch donkey sentences, the Dutch test items were simply the translation of the English version. Learning from the fact that descriptions would offer biased information to the interpretations, Geurts presented with picture situations of a truth-value judgement task in judging whether the target donkey sentence could conform to the picture illustrations. Four quantifiers were utilized – *every*, *not every*, *some* and *no* – with six different situation types (railway line-road, line-square, O-K, child-balloon, girl-dog and boy-girl) setting for the test items of donkey sentences. For example, the following two examples and pictures are extracted from Geurts (2002:136).

(13) Quantifier: *every*

Situation type: *boy-girl*

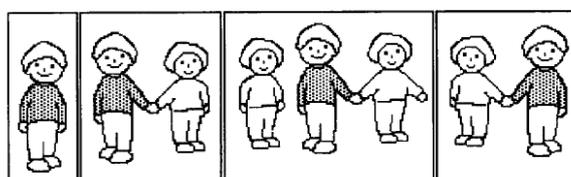


Figure 2-1. *Every boy that stands next to a girl holds her hand.*

(14) Quantifier: *every*

Situation type: *railway line-road*

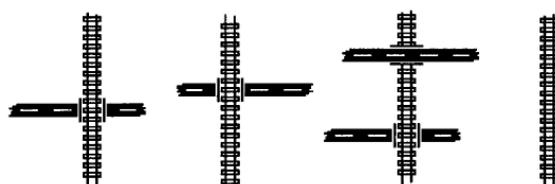


Figure 2-2. *Every railway line that crosses a road goes over it.*

The results turned out that for sentences with weak determiners, *some* and *no*, nearly all subjects considered those sentences with an existential reading to be true in all six situations, but that for those with universal determiners, *every* and *not every*, the interpretations were not in neat consensus. In general, 60% of preference for universal readings showed that for universal determiners, there was an overall tendency for universal readings; however, context of the child-balloon, girl-dog and boy-girl situation types tended to be interpreted as existential readings that lowered the percentage of preference for universal readings.

Geurts argued that the differences between situation types could offer a solid explanation for the discrepancy of readings in both a semantic and ontological aspect. From a semantic viewpoint, weak determiners obtain an intersective property that leads us to focus on positive evidence; in contrast, universal determiners lack this property. Therefore, it is expected that this property of weak determiners would render their donkey pronouns to have existential readings. On the other hand, for universal determiners, differences are shown in the noun phrase the determiner describes, which shows the ontological differences of the noun phrases. Since one of the four pictures denoted an existential reading, if it were a non-individual, like *railway line*, it could be counted more than just once; on the other hand, if it were an individual, like *boy*, our intuition would not permit us to count one individual more than once; hence, this counting difference renders sentences with nouns of individuals that universal determiners modify to obtain existential readings. This contrast in universal determiners is

also named the contrast of cases, which includes events and facts, and characters, which involves individuals.

As a result, it was proposed by Geurts that the interpretation of donkey sentences should rely on the initial determiners and world knowledge based on factors, such as determiners and the case or individual of the noun phrases, and that donkey sentences should not obtain definite interpretations. Geurts' analysis is quite promising, offering us factors that are influential to an interpretation, including world knowledge and the nature of determiners and of indefinite nouns. However, she mainly focused on the generalizations of interpretations; therefore, only one group of subjects was recruited, and only one task was designed. Picture illustrations were novel for empirical materials in donkey sentences, but it might seem to be task-demanding with four pictures as a whole for the subjects to judge the correspondence with the target sentence.

### **2.3.2 Foppolo (2009)**

Foppolo (2009) aimed to test experimentally whether there is a preferred interpretation of the dependent variable in donkey sentences, and whether there is a default one that retains the monotonicity of the quantifier based on the generalization of Kanazawa (1994), which states that a universal quantifier entails a universal reading of the sentence while an existential quantifier leads to an existential reading.

According to Foppolo, the two readings of the donkey pronoun are not independently present; instead, one always entails the other, and entailment applies to the monotonicity of the quantifier. Hence, if the quantifier is the universal one *every*, then the strongest reading is the *universal* one, entailing the *existential*; if the quantifier is *no*, the strongest reading is the *existential* reading, entailing the *universal*; if the quantifier is the existential quantifier *some*, nevertheless, it is the *universal* reading that is the strongest and entails the *existential*. Nevertheless, the prediction is that the default reading relies on the left monotonicity of the quantifier; therefore, it is predicted that the *universal* reading is preferred for donkey sentences with *every*, and the *existential* reading for donkey sentences headed by *no* and *some*.

Two experiments were employed by Foppolo (2009) for the examination of Kanazawa's Generalization, exploring whether this default reading existed, whether the preference was in the same vein of Kanazawa's analysis, and whether biased contexts influenced the reading. Three quantifiers were taken into investigation – *every* with the predicted preference of a universal interpretation, while *no* and *some* with the predicted preference for an existential interpretation.

The first experiment was concerned with the existence of the default interpretation. Thirty subjects were asked to take a truth-value judgement task and to evaluate whether the four pictures could express the interpretation of the target sentence with a quantifier in three

different situations, and their reaction time was recorded. The subjects were told to be “charitable” when doing the tasks. To eliminate the possibility of extra-linguistic or world knowledge interfering the results, fantasy names were used in order to obtain their real interpretations of the pronouns. Target sentences with the three quantifiers, *every*, *no* and *some*, were put into three different situations – one that was compatible with both universal and existential readings (non-differentiating true, NDT), one that was compatible with neither of the two readings (non-differentiating false, NDF), and one that was compatible with only one of the readings (differentiating-critical, DC).

The results of the first experiment showed that the default of interpretation existed. First, concerning the results of the control conditions in the three quantifiers, both the control-false condition (NDF) and the control-true condition (NDT) obtained correct responses as high as 96%. Furthermore, the DC condition illustrated that for sentences introduced by *no* and *some*, the subjects tended to interpret them with an existential reading, but that no clear tendency occurred in sentences introduced by *every*. For the first two quantifiers, the subjects with a high percentage rejected the sentence headed by *no* with a universal reading and accepted the sentence headed by *some* with an existential reading; however, for *every*, only roughly about half of the subjects rejected sentences headed by *every* with an existential reading.

Foppolo’s first experiment showed that Kanazawa’s Generalization was partially correct; in addition, Foppolo emphasized the reaction time in the three situations offered some insight.

Longer reaction time was perceived in the DC condition with sentences introduced by *every* than with ones introduced by *some*, both of which were presented an existential reading of pictures. Also, there was no great difference in reaction time on sentences headed by *every* between in the NDT situation, which favored the universal reading, and in the DC situation, where the existential reading was presented only. Hence, as shown with the reaction time, although no high percentage was obtained to deny the existential reading of sentences introduced by *every*, the reaction time on the acceptance showed that the choices of truth-values were not that arbitrary for the subjects and quantifiers were indeed influential.

Although the generalization has been affirmed, the second experiment was employed to further confirm whether the alternative readings were accessible. Subjects were other thirty-six students recruited to examine the test items in a truth-value judgement task. Only taking the NDF and the DC conditions into investigation, and providing with biased contexts, Foppolo was to explore whether the subjects would be induced to choose an alternative reading, which is a disfavored one, and the two situations were designed with the disfavored reading based on the generalization.

The results turned out that no significant effect on context was seen in the control situation; however, a significant effect was presented in the critical DC condition for *every* in that with biased contexts, the subjects were greatly influenced and chose to take an *existential* reading, which is a disfavored one. On the other hand, biasing contexts did not bring about

the subjects to change their interpretation of the donkey pronouns in sentences introduced by *no* and *some*. It was shown that the subjects were easily induced by biasing contexts with sentences introduced by *every*, and Foppolo reasoned that the instruction of “being charitable” could also render them to such results. Overall, it was proved by Foppolo’s two experiments that Kanazawa’s Generalization is correct, which states that the left monotonicity on the head quantifier presents default interpretations of the donkey pronouns.

The experiments and the results showed the confirmation of Kanazawa’s predictions. However, due to the fact that Foppolo only explored the default interpretations of donkey pronouns, the subject recruitment was only one group in each experiment. In addition, for the task design and materials, four pictures with fantasy names in target sentences could be task-demanding, and in a total of seventeen test items, only nine of them were critical test sentences. The number of test items was small, and this design was challenging with four pictures integrated as a whole.

### **2.3.3 Grosz et al. (2014)**

Grosz et al. (2014) employed an experiment concerning the anaphoric properties of donkey sentences involving constraints on the antecedent. Three main constraints were investigated in the experiment – the overtiness, the syntactic position and the uniqueness of an NP antecedent – to see what constrains the referentiality of the antecedent to the donkey

pronoun.

First of all, the overtness of the NP antecedent has been proposed to be crucial for a pronoun referring back to it, and it was the first constraint named the Overt NP Antecedent Constraint. Overtness is concerned with the noun phrase as an antecedent which could not be a part of a word, for example in the following examples extracted from Grosz et al. (2014:4), the antecedent *fatherless* in (15b) would be a non-overt antecedent while *without a father* in (15a) is an overt one.

- (15) a. Every child who was without *a father* had lost *him* in the war.  
b. Every child who was *fatherless* had lost *him* in the war.

Second, it was argued that the syntactic position of the antecedent would greatly influence the acceptability of referring a donkey pronoun back to its antecedent. This is named the Salient Position Condition, which states a predicate position is more salient than a modifier position. Below are examples taken from Grosz et al. (2014:4) with this Salient Position Condition, where in (16a) the predicate position is more salient than the modifier position in (16b).

- (16) a. [Every child who was *fatherless*] had lost *him* in the war.  
b. [Every *fatherless* child] had lost *him* in the war.

Furthermore, the third constraint was associated with the uniqueness of a singular donkey pronoun. It is greatly related to the world knowledge of the antecedent, for instance, while uniqueness is fulfilled in *father* since everyone can only have one biological father, it is

violated in *friend* since the presumption cannot be made regarding one would have only one friend. Through the experiment, Grosz et al. expected to see whether all three constraints would activate the referentiality of the antecedent to donkey pronouns, and whether the three interact with one another.

In addition to the above three main factors in the experiment, Grosz et al. discussed one more factor (i.e., the word type) – the N-less group and the N-owner group – since the Uniqueness Condition appears to apply as a different role in the two groups. The former group will not obtain the presupposition of the existence of the N while the latter will. For example, it is self-evident that *horseless* does not entail the subject possessing a horse; in contrast, *horse-owner* then certainly entails the subject having a horse.

Grosz et al. expected the results could support the theoretical analysis of donkey sentences; hence, the two competing approaches – the E-type pronoun approach and the dynamic semantic approach – were compared. The former approach discusses the existential reading of the sentence. On the other hand, the latter approach is concerned with how interpretations of sentences influence contexts; therefore, the process of interpretations is dynamic since new information in the discourse will keep updating old information<sup>7</sup>.

With regard to the item types of the antecedent, the approaches make different predictions on uniqueness. Concerning the N-less type, both the approaches predict that

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<sup>7</sup> One of the approaches to dynamic semantics is Discourse Representative Theory (DRT), which is what the unselective binding approach based on to be used to analyze Chinese conditionals. Under this approach, interpretations are discourse representatives that integrate together to offer complete information to discourse.

uniqueness plays a role in the interpretation of donkey pronouns. In terms of the N-owner type, the predictions of the two approaches diverge – the E-type approach still predicts the uniqueness of the antecedent, however, the dynamic approach does not.

A hundred and twenty-five adult subjects were recruited. An acceptability-rating task was conducted with a total of 102 sentences with 30 critical sentences and seventy-two fillers involved, and a plausibility norming task was employed consisting of thirty-nine pairs of test items. In the first task, the subjects were asked to choose the scale of five levels from “extremely unnatural” to “extremely natural.” The four factors were taken into investigation – overtness, salience of syntactic position, uniqueness and word-types. Quantifiers in the experiment were *every*, *no* and *many*. In the norming task, it was to test the uniqueness of the antecedent.

The results showed four different effects. A prenominal-postnominal effect where the acceptability in the postnominal type was higher, indicated the salience of syntactic position did work. An effect of overtness showed the acceptability of the overt types greatly exceeded the other. An effect of word-type presented the N-owner type was much more acceptable than the N-less type, and an effect of uniqueness was obtained where the ratings in unique antecedents were higher than those in non-unique ones. Also, an interaction was obtained between uniqueness and the word-type where only the N-less type showed a uniqueness effect.

All in all, it was argued by Grosz et al. that the presences of the Overt NP Constraint and the Salient Position Condition were verified. Moreover, the interaction between uniqueness and word-type confirmed the dynamic approach, which predicted uniqueness would not operate in the N-owner type. This was the crucial evidence for Grosz et al. to propose that the dynamic approach to donkey sentences suited well.

The analysis and the design of Grosz et al.'s overall experiment were very novel and elegantly displayed, especially where they provided solid evidence to support the dynamic approach. Nonetheless, questions of subject recruitment and of the design in the two word-types arise. Since it was to see how the constraints interplay with referentiality, no contrasting group was compared but only one group recruited. As to the material design, it seems reasonable even without conducting an experiment to consider the N-less type has a uniqueness presupposition while the N-owner does not. Although the factor of the word-type seems appropriate, the contrast of the two designed types does not appear that valid. Hence, it might be more persuasive if the uniqueness effect could be found in all donkey sentence types instead of just the word-types that Grosz et al. designed. Also, the aim of the acceptability-rating task was designed to see the referentiality of the antecedent to the donkey pronoun; however, such a task may be challenging for the subjects to consider this issue.

#### **2.3.4 Summary of the Empirical Studies**

As presented in Table 2-1, Geurts (2002) and Foppolo (2009) were concerned with the

interplay between semantic entailing of quantifiers and the donkey pronoun, while Grosz et al. (2014) focused on the factors of the NP antecedent rendering the donkey pronoun interpretable.

**Table 2-1. Major Findings and Limitations of the Empirical Studies**

	<b>Major findings</b>	<b>Limitations</b>
Geurts (2002)	<ul style="list-style-type: none"> <li>➤ Quantifier types and readings: Existential reading: weak determiners</li> </ul>	<ol style="list-style-type: none"> <li>1. Subjects: only one group recruited</li> <li>2. Materials: pictures with too many illustrations</li> <li>3. Task: only one task (a truth-value judgement task)</li> </ol>
Foppolo (2009)	<ul style="list-style-type: none"> <li>➤ Quantifier types and readings:               <ol style="list-style-type: none"> <li>1. Existential reading: <i>no</i> and <i>some</i></li> <li>2. Universal reading: <i>every</i></li> </ol> </li> <li>➤ Biased contexts: the readings of the pronouns could be biased in sentences with universal quantifiers</li> </ul>	<ol style="list-style-type: none"> <li>1. Subjects: only one group recruited</li> <li>2. Materials: pictures with too many illustrations and only seventeen test items in total, where only nine of them were critical sentences</li> </ol>
Grosz et al. (2014)	<ul style="list-style-type: none"> <li>➤ Constraints on the antecedent:               <ol style="list-style-type: none"> <li>1. Overtneess</li> <li>2. Salience</li> <li>3. Uniqueness</li> <li>4. Word-types</li> </ol> </li> </ul>	<ol style="list-style-type: none"> <li>1. Subjects: only one group recruited</li> <li>2. Tasks:               <ol style="list-style-type: none"> <li>(1) A problematic acceptability ratings task</li> <li>(2) Only specific test sentences selected for the N-less and the N-owner type in the norming task</li> </ol> </li> </ol>

Generally, the interpretations of the antecedent from world knowledge is crucial for the donkey pronoun (Geurts 2002, Foppolo 2009, Grosz et al. 2014). Nevertheless, to what extent world knowledge influences interpretations of donkey sentences becomes a vital factor is

different across three previous studies. Quantifiers are one crucial factor where existential quantifiers tend to lead existential readings only, while universal quantifiers often entail universal readings but sometimes existential readings (Geurts 2002, Foppolo 2009). Moreover, properties of the NP antecedent (Geurts 2002, Grosz et al. 2014), and the uniqueness of the donkey pronoun and the antecedent (Geurts 2002, Grosz et al. 2014) are also influential. Furthermore, only one study provided evidence for context which may be successful biasing the interpretations of universal quantifiers (Foppolo 2009).

Limitations of these studies show that they mainly focused on the generalizations of donkey pronouns (Geurts 2002, Foppolo 2009) and the referential properties of the antecedents (Grosz et al. 2014), so they neglected some details for experiments. First of all, concerning the subject pool, all of them recruited only one group without any other contrasting group. Second, with regard to the materials, especially those for the task design, one was a display of target sentences only (Grosz et al. 2014), and two were presented with target sentences with picture illustrations, which contained four pictures as a whole that might be too challenging (Geurts 2002, Foppolo 2009). Third, the number of tasks was different – one employed only one task (Geurts 2002), and the others conducted two tasks (Foppolo 2009, Grosz et al. 2014). Lastly, the number of test items could be vital as well, where too little of test sentences might not be evidential (Foppolo 2009).

All in all, with interpretations of donkey sentences as a main concern, there is a

mismatch in two different generalizations supported in previous studies. Krifka (1996) in the theoretical section shows another version of quantifier entailing generalization (Rooth's Generalization) that is opposite to what Geurts (2002) and Foppolo (2009) have supported (Kanazawa's Generalization). Hence, there has been no consensus to the generalizations of quantifier entailing interpretations that awaits to be further explored. In addition, biasing contexts, which is an influential factor in interpretations, deserves to be further examined as well.

#### **2.4 Summary of Chapter Two**

This chapter discusses what previous works have proposed on the topics of donkey sentences and bare conditionals. Chinese conditionals are considered as one type of donkey sentences due to their similar referential behaviors; however, opposition to this analysis arises arguing that Chinese conditionals are just one pattern of relative clause constructions rather than donkey sentences. Moreover, two constraints that are construction-specific to interpretations in each construction, quantifier types for donkey sentences and parallelism for bare conditionals, are discussed. Analyses concerning the constraints are in dispute, but that shows the two constraints are worth investigating. In addition, empirical studies on interpretations of the donkey variables are reviewed. There seems to be some preferences for a certain reading due to the influence of quantifiers, but a factor such as world knowledge may lead to a different reading.

## Chapter Three

### Research Design

This chapter introduces the information of the subjects and the research design that the experiments of the present study conducted. In Section 3.1, the recruitment of the subjects is described. In Section 3.2, the design of the experiments and the materials are included, while in Section 3.3, the procedures of the experiments are presented. Lastly, Section 3.4 summarizes this chapter.

#### 3.1 Subjects

The present study compared donkey constructions with bare conditionals from an empirical perspective. Little literature has provided an empirical aspect concerning these two constructions in Mandarin Chinese; nevertheless, in these two constructions, one of the key elements that plays a crucial role in interpretation is quantification. Hence, the present study aimed to look into how quantifiers were interpreted in children's acquisition.

Since the work of Inhelder & Piaget (1958) on children's interpretations of quantifiers, it has been found that children had difficulty obtaining an adult-like comprehension of a quantificational sentence like "Is every boy riding an elephant?" in response to a picture illustrated with four elephants and three of them each ridden by a boy. Adults tended to answer 'yes' while children between four and seven answered 'no' since they had difficulty

comprehending such a mismatch of quantification in pictures (Herburger 1997, Cohen 2001, Geurts 2003). Following previous studies, the researcher would like to see whether the age difference would show this difficulty when it was concerned with donkey sentences and bare conditionals in Mandarin Chinese where they are involved in quantification.

Accordingly, the present study was to explore between the age span of four to seven, whether kindergarten children (KS) at five years old would misinterpret the sentences and whether after seven years old, an adult-like interpretation would be obtained by Grade 2 or should wait until Grade 4, that is, nine years old. Therefore, as seen in Table 3-1, the present study recruited three experimental groups at the ages of five, seven and nine, to compare their interpretations on quantification in donkey sentences and bare conditionals, each of which contained eighteen subjects. Subjects of KS were Taiwanese children studying in New Taipei Municipal BeiXin Kindergarten School, while Grade 2 and Grade 4 were those from New Taipei Municipal BeiXin Elementary School.

**Table 3-1. Information of Subjects**

Group		Age range	Number of subjects
Experimental	KS	5-6	18
	Grade 2	7-8	18
	Grade 4	9-10	18
Control	Adults	19-22	18

As shown in Table 3-1, eighteen native Mandarin-speaking adults aged from 19 to 22, who

were undergraduate students in National Taiwan Normal University, were also recruited as a control group to contrast the overall performances of children and to verify the legitimacy of the test sentences.

### **3.2 Materials and Methods**

When it comes to testing comprehension or interpretation in acquisition, it is more suitable to choose a cross-sectional study comparing to a longitudinal one since it allows an experiment to manipulate with factors within a short period of time (Miller 1987, Larsen-Freeman & Long 1991, Gass & Selinker 1994).

This present study followed the essence of the designs from previous studies (Geurts 2002, Foppolo 2009) where cross-sectional experiments were conducted and where picture illustrations were provided as a truth value judgement task, and for another phase of the experiment, biasing contexts were provided in prior to target sentences. However, unlike previous studies (Geurts 2002, Foppolo 2009), in order to avoid picture ambiguity, the present design put two picture situations for the subjects to choose from instead of four pictures situations as a whole for truth value judgement, and take a construction-related factor, like readings of sentences into account, in order to test the relatedness of donkey sentences and bare conditionals. Previous studies have not examined the interrelationship in semantic interpretations between the two constructions (as reviewed in Section 2.1), and no consensus

on whether Chinese conditionals can really be regarded as one type of donkey sentences has been reached (Cheng & Huang 1996, Pan & Jiang 1997, Cheung 2007, Wang 2007). Accordingly, with the quantificational force in interpretation that they have in common, this study selected Chinese bare conditionals as a representative structure to compare with donkey sentences to see their relatedness by examining the interpretations (universal or existential readings) of the target sentences of the two constructions. Hence, the results could indicate which reading (universal or existential) was easier for children to acquire, and whether the two constructions exhibited similar tendency in readings.

In addition to interpretations that held to investigate the relation between the two constructions, factors that are specific to each construction (as reviewed in Section 2.2) were taken into consideration (Cheng & Huang 1996, Krifka 1996, Pan & Jiang 1997, Geurts 2002, Cheung 2007, Wang 2007). Details of the factors would be introduced in the following subsections.

Therefore, for the material design of the two constructions with factors added in, two tasks were conducted respectively – one was of sentences in isolation to see whether the subjects had unanimous interpretations for readings, and the other was of sentences in context. Unlike in literature (Foppolo 2009) where only biasing contexts were put in the task, the present study also designed supporting ones to see whether supporting contexts can reinforce subjects' interpretations and whether biasing context could affect interpretations. In this section, the

designed materials are described in two subsections – Section 3.2.1 presents materials of donkey sentences while Section 3.2.2 illustrates those of bare conditionals.

### 3.2.1 Donkey Sentences

Two tasks for donkey sentences were designed, that is, one with sentences in isolation and the other with sentences in context. Illustrations of pictures and contexts were shown with biasing or supporting information. Factors, one construction-related factor and one construction-specific factor, which are crucial to interpretations, were put into the material design.

Concerning the construction-related factor, interpretations of the sentences (universal or existential readings) were examined in order to explore the readings in donkey sentences and then to compare with readings in bare conditionals. Additionally, the construction-specific factor, quantifier types, were investigated since quantifier differences has been considered vital to the interpretations of donkey sentences (Rooth 1987, Kanazawa 1994, Krifka 1996, Geurts 2002, Foppolo 2009). The quantifiers in the design were *mei* ‘every,’ *youxie* ‘some’ and *bushi meige* ‘not every.’ Krifka (1996) believes that the quantifier, *not every*, which is identical to *bushi meige* ‘not every,’ is the negation of the universal quantifier, *every*, where readings of sentences with *bushi meige* ‘not every’ should be identical to those of sentences with *mei* ‘every.’ Nevertheless, the expected reading of *bushi meige* ‘not every’ was an existential

reading like *youxie* ‘some’ in the present study, while *mei* ‘every’ was the quantifier eliciting a universal reading. Hence, with this factor that is specific to donkey sentences, the present study explored whether the results would refute or support previous studies. The structure of the design for donkey sentences in Mandarin Chinese is shown in Table 3-2:

**Table 3-2. The Structure of Donkey Sentences<sup>1</sup>**

Type	Number	Example	Expected reading	Q in DSII & DSIC	Q in the real tasks
Type 1: <i>mei</i> ‘every’	4	<i>Meige you qiqiu de xiaopengyou dou xihuan qiqiu.</i> ‘Every child who has a balloon loves it.’	Universal reading	Q1, Q4, Q7, Q10	Q4, Q8, Q21, Q25
Type 2: <i>youxie</i> ‘some’	4	<i>Youxie you qiqiu de xiaopengyou dou xihuan qiqiu.</i> ‘Some children who have a balloon love it.’	Existential reading	Q2, Q5, Q8, Q11	Q5, Q9, Q12, Q16
Type 3: <i>bushi meige</i> ‘not every’	4	<i>Bushi meige you qiqiu de xiaopengyou dou xihuan qiqiu.</i> ‘Not every child who has a balloon loves it.’	Existential reading	Q3, Q6, Q9, Q12	Q13, Q17, Q20, Q24
<b>Total</b>	<b>12</b>				

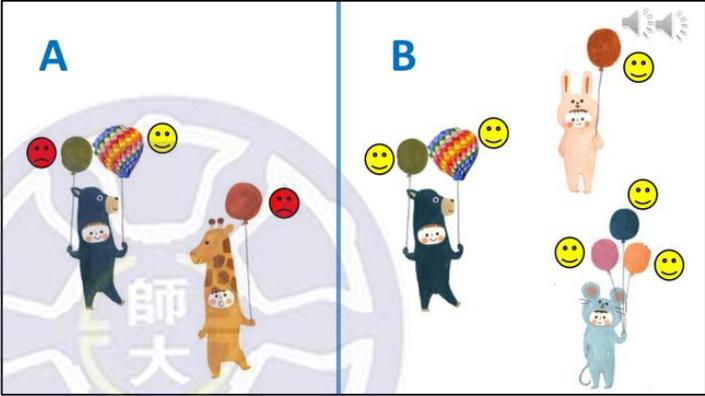
As illustrated above, Type 1 refers to the quantifier, *mei* ‘every,’ Type 2 is the quantifier, *youxie*

<sup>1</sup> No filler was added in the design of both the donkey construction and the bare conditional construction. For fear that children should not finish the tasks attentively when there were too many task items, no extra filler was put. Nevertheless, the design was of two phases of the experiments. Phase I were sentences in isolation where two constructions were compiled together to function as each other’s filler sentences, and Phase II were sentences in context in the same fashion as Phase I.

‘some,’ and Type 3 is sentences with the quantifier, *bushi meige* ‘not every.’ Four sentences were designed under each type, and all in all, that consisted of twelve donkey sentences in Mandarin Chinese.

Below is a task example for donkey sentences in insolation, abbreviated as DSII, as seen in Table 3-3. For more details, please refer to Appendix A.

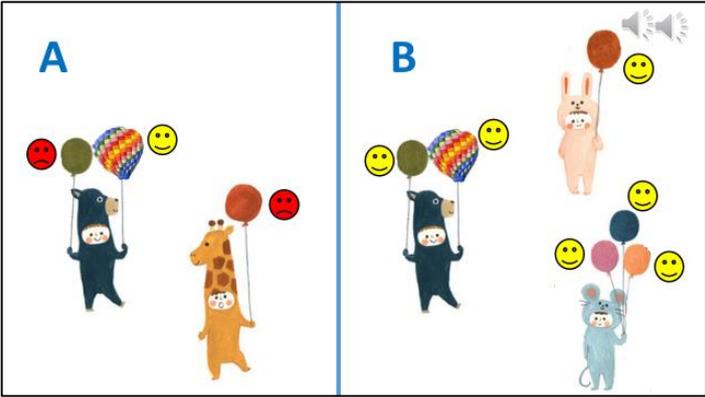
**Table 3-3. An Example of Donkey Sentences in Isolation**

<p>The subject saw:</p>	
<p>The subject heard:</p> <p>“<i>Meige you qiqiu de xiaopengyou dou xihuan qiqiu.</i>” <i>Qingwen shi Tupian A haishi Tupian B shi zhe ju hua de yisi ne?</i></p> <p>“‘Every child who has a balloon loves it.’ Is it Picture A or Picture B that describes the meaning of this sentence?’</p>	

A task example in context, abbreviated as DSIC, is illustrated in Table 3-4. For more details, please refer to Appendix B for the complete test items used in the DSIC.

**Table 3-4. An Example of Donkey Sentences in Context**

<p>The subject saw: (Scene 1)</p>	
<p>The subject heard:</p> <p><i>Nongchang de xiaochou hen hui zuo qiqiu. Jintian ta zuo le yi-ge tebie zaoxing de qiqiu.</i> ‘The clown in the amusement park is very good at making balloons. Today he makes a special balloon.’</p>	
<p>The subject saw: (Scene 2)</p>	
<p>The subject heard:</p> <p><i>Xiaopengyou dou hen xiangyao na yi-ge qiqiu.</i> ‘Children all want that balloon.’</p>	

<p>The subject saw: (Scene 3)</p>	
<p>The subject heard:</p> <p>“Meige you qiqiu de xiaopengyou dou xihuan qiqiu.” <i>Qingwen shi Tupian A haishi Tupian B shi zhe ju hua de yisi ne?</i></p> <p>“Every child who has a balloon loves it.” Is it Picture A or Picture B that describes the meaning of this sentence?</p>	

### 3.2.2 Bare Conditionals

Two tasks for bare conditionals were designed as well, one with sentences in isolation and the other with sentences in context. Picture illustrations and contexts were provided with biasing or supporting interpretation. Like in donkey sentences, the construction-related factor, which was concerned with readings of the bare conditional sentences, was taken into account in order to see the subjects’ performances on readings in bare conditionals and further on to compare readings in the two constructions.

Moreover, one construction-specific factor, parallelism, was involved. For parallelism, Cheng & Huang (1996) provide an analysis that bare conditionals only exhibit *wh*-words in the consequent clause; nevertheless, some counterexamples provided by Pan & Jiang (1997),

Cheung (2007) and Wang (2007) challenge this analysis. Therefore, this study addresses this construction-specific factor of parallelism, predicting that sentences in parallel *wh*-words would elicit readings in different degrees from those in non-parallel *wh*-words.

As shown in Table 3-5, Type 1 refers to bare conditionals with parallel *wh*-words in the antecedent and consequent clauses; on the other hand, Type 2 refers to those with nonparallel *wh*-words in the two clauses. Eight sentences were contained in each type; therefore, there were sixteen bare conditional sentences in Mandarin Chinese in total.

**Table 3-5. The Structure of Bare Conditionals<sup>2</sup>**

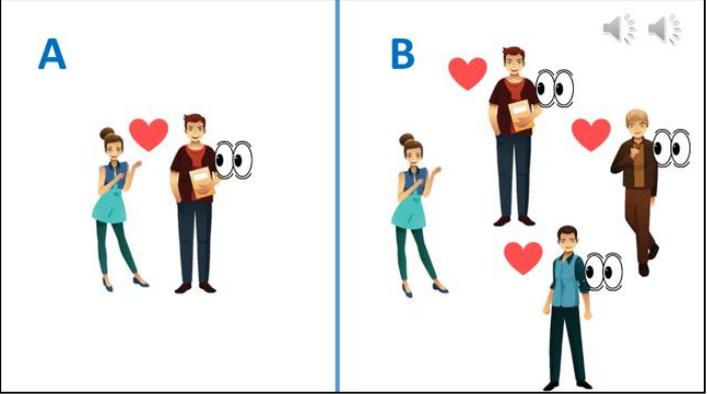
Type	Number	Example	Expected reading	Q in BCII & BCIC	Q in the real tasks
Type 1: parallelism	8	<i>Ni xihuan shei, wo jiu jian shei.</i> 'You like X, then I will meet X.'	Universal reading	Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8	Q1, Q2, Q3, Q10, Q11, Q18, Q19, Q26
Type 2: non-parallelism	8	<i>Ni xihuan shei, wo jiu jian ta/ [e]/ na-ge-ren.</i> 'You like X, then I will meet X.'	Universal reading	Q9, Q10, Q11, Q12, Q13, Q14, Q15, Q16	Q6, Q7, Q14, Q15, Q22, Q23, Q27, Q28
<b>Total</b>	<b>16</b>				

Below is a task example for bare conditionals in isolation, abbreviated as BCII, as seen in

Table 3-6. For more details, please refer to Appendix C.

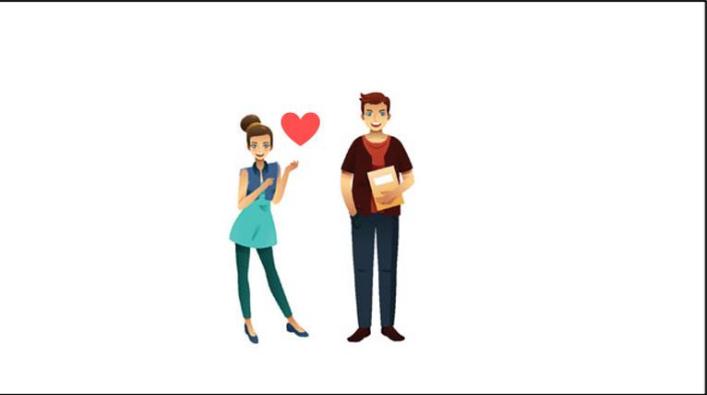
<sup>2</sup> No filler was involved. Since sentences in two phases of the experiments (Phase I: sentences in isolation of the two constructions; Phase II: sentences in contexts of the two constructions) were randomized respectively, they were each other's filler sentences.

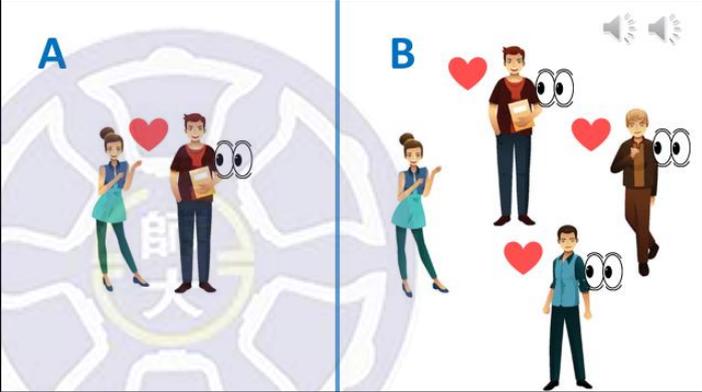
**Table 3-6. An Example of Bare Conditionals in Isolation**

<p>The subject saw:</p>	
<p>The subject heard:</p> <p><i>“Ni xihuan shi, wo jiu jian shi.” Qingwen shi Tupian A haishi Tupian B shi zhe ju hua de yisi ne?</i></p> <p>“You like whom, then I will meet whom.” Is it Picture A or Picture B that describes the meaning of this sentence?</p>	

A task example in context, abbreviated as BCIC, is illustrated in Table 3-7. For more details, please refer to Appendix D for all test items used in the BCIC.

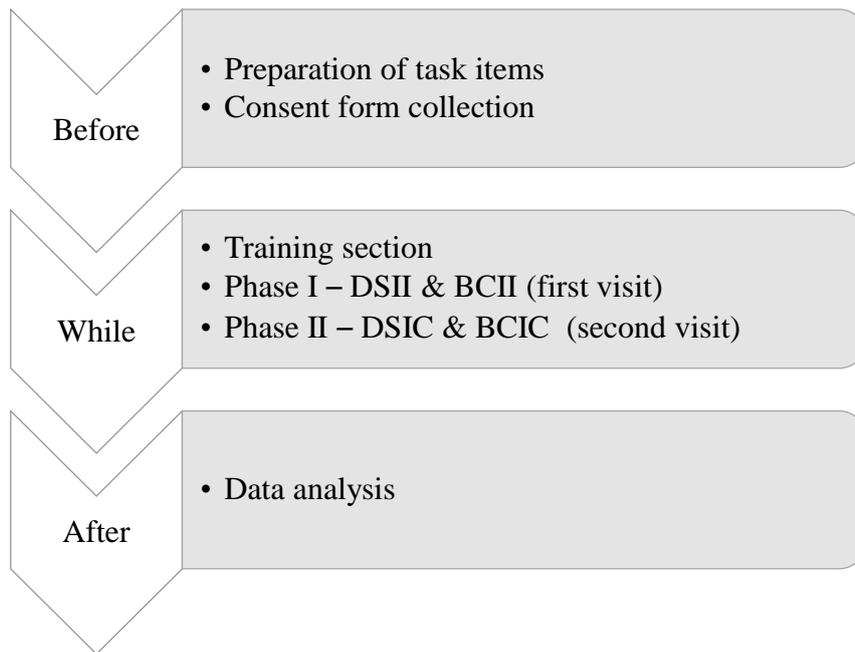
**Table 3-7. An Example of Bare Conditionals in Context**

<p>The subject saw:</p> <p>(Scene 1)</p>	
<p>The subject heard:</p> <p><i>Xiaohua hen xihuan ta de nanpengyou.</i></p> <p>‘Xiaohua likes her boyfriend very much.’</p>	

<p>The subject saw: (Scene 2)</p>	
<p>The subject heard: <i>Xiaohua dai nanpengyou rang Xiaohua de fumu renshi.</i> 'Xiaohua let her boyfriend be acquainted to her parents.'</p>	
<p>The subject saw: (Scene 3)</p>	
<p>The subject heard: <i>Yinwei Xiaohua de fumu shuo, "Ni xihuan shi, women jiu jian shi."</i> Qingwen shi Tupian A haishi Tupian B shi zhe ju hua de yisi ne? 'Because Xiaohua's parents said to her, "You like whom, then we will meet whom." Is it Picture A or Picture B that describes the meaning of this sentence?'</p>	

### 3.3 Procedures

As seen in Figure 3-1, there were three stages of procedures – before, while and after the experiments.



**Figure 3-1. Procedures of the Experiments**

First, before the experiments, that is, the stage of pre-experiment, task items of sentences in isolation and sentences in context were randomized respectively. Tasks of sentences in isolation (DSII and BCII) were compiled together into one file, which can be referred to Appendix E, and those of sentences in contexts (DSIC and BCIC), which are shown in Appendix F, were likewise. Since sentences were randomized together in both phases, they were each other's filler sentences; therefore, the subjects could not detect or develop any strategy related to the constructions. All of the task items were presented in truth value judgement tasks with two picture situations for them to choose, all of which were illustrated with picture illustrations on PPT slides and with the audio recording of the task items recorded in advance. Moreover, consent forms (please refer to Appendix G) were collected to ensure parents of the children in the experimental groups and adults in the control group had agreed

to take the experiments before the subjects participated. Subjects at the ages of five, seven and nine were recruited as the experimental groups and college students were as the control group.

In addition, at the stage of conducting experiments, there was a training section in the beginning to inform the subjects how to answer the task items. It took about five to ten minutes to instruct them the way to make judgements to the pictures. Since the tasks were truth value judgement tasks based on picture illustrations, the subjects were asked to decide either it was Picture A or Picture B that could fully describe the target sentence. For each subject, there were two visits. For the first visit, Phase I were conducted and for the second visit, Phase II. The subjects were asked to write down “A” or “B” for the target sentences on an answer sheet, but for KS who might find it difficult to write down the choices, they were required to circle either A or B, which were already shown on their answer sheets. It took the subjects about thirty minutes to complete tasks in Phase I, and about sixty minutes to complete those in Phase II.

Lastly, the final stage, the post-experiment, was concerned with the scoring policy, where mean scores of the universal and existential readings were counted. If the given test sentence was predicted to elicit a universal reading, and the answer from a subject was the picture that demonstrated a universal reading, then it was documented as a correct answer. On the other hand, if under the same circumstance, but the answer from a subject was the other picture which described an existential reading, it meant that this subject considered the sentence elicited an existential reading; hence, it was documented as a wrong answer. Mean scores were counted

group by group.

After counting the mean scores within each construction and each type of factors, the data from the two phases were analyzed with the RStudio for comparisons of the mean scores. The common analysis for data with comparisons between mean scores is the one-way ANOVA test, and the basic assumptions of the test are that the residuals of the data should be in normality and the data should have constant variance. Nevertheless, all the data in the present study were relatively small, and after transformation, the residuals of the data still violated normality and the data were not with constant variance. As a result, the one-way ANOVA test was not suitable for analysis of the present study. Instead, the Kruskal-Wallis rank sum test, which has no such assumptions as the ANOVA test, was conducted to calculate the mean scores within each group and each type to see if there was a significant difference. It was to see whether children had the tendency in interpretations identical to adults' and to explore whether the preference for readings and construction-specific properties supported what previous studies have proposed (Kanazawa 1994, Yoon 1994, 1996, Cheng & Huang 1996, Krifka 1996, Pan & Jiang 1997, Geurts 2002, Cheung 2007, Wang 2007).

### **3.4 Summary of Chapter Three**

This chapter introduces the methodology of the present study, including information of the subjects, the task design of donkey sentences and bare conditionals, the procedures of the

experiments and the data analysis. Children that were KS, Grade 2 and Grade 4 were recruited as experimental groups, and the adults were as a control group, each of which consisted of eighteen subjects. Two phrases of the experiments were conducted, where the subjects completed the tasks of sentences in isolation in Phase I, and in the second visit, they finished the tasks of sentences in context in Phase II. These tasks were to identify the subjects' interpretations of donkey sentences and bare conditionals and to see whether factors that were put under design would influence the subjects' readings. Their answers were investigated by statistical analysis to explore children's acquisition of the two constructions.



## Chapter Four

### Results and Discussion

This chapter reports and discusses the results of the present study. Section 4.1 explores the construction-related factor, that is, the relatedness of the two constructions. Section 4.2 examines the construction-specific factors, quantifier types and parallelism, respectively. Section 4.3 addresses whether contextual clues, either supporting or biasing context, influence the subjects, and Section 4.4 discusses the age effects on L1 acquisition. Lastly, Section 4.5 concludes this chapter with a summary.

#### 4.1 Construction-related Factor: Relatedness of the Two Constructions

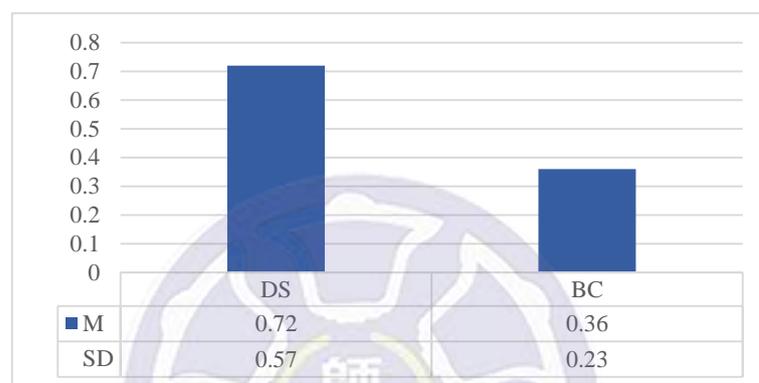
This section discusses the relatedness of donkey sentences and bare conditionals based on their readings. Section 4.1.1 provides overall findings concerning the two constructions, and Section 4.1.2 presents the discussion about this issue.

##### 4.1.1 Overall Findings

In both constructions, readings were elicited and categorized according to literature. Donkey sentences were coded on the basis of the quantifier types in accordance to Kanazawa's Generalization (1994), where sentences with the quantifier *mei* 'every' were encoded with universal readings, and sentences with the quantifier *youxie* 'some' and *bushi meige* 'not every'

with existential readings. Bare conditionals were coded based on Cheng & Huang (1996) with universal readings. Mean scores of the two constructions were counted in order to investigate their relatedness. Therefore, it is hypothesized that if the mean scores of the two constructions are close, the relatedness of the two constructions can be supported.

An overall between-construction comparison is presented in Figure 4-1.



**Figure 4-1. Subjects' Overall Interpretations of the Two Constructions**

It was found that the subjects scored higher on donkey sentences than on bare conditionals ( $M=0.72 > 0.36$ ), indicating that donkey sentences were much easier to interpret than bare conditionals.

The Kruskal-Wallis rank sum test was used to examine the difference of the mean scores in the two constructions within the four groups, and a significant difference was found ( $\chi^2(1)=77.83, p<.001$ ). Table 4-1 examines more thoroughly the relatedness of the two constructions in each group. It was found that except KS, which received a higher score on bare conditionals ( $M=0.66 > 0.43$ ), Grade 2, Grade 4 and the adults all scored higher on donkey

sentences (Grade 2:  $M=0.76 > 0.51$ ; Grade 4:  $0.80 > 0.54$ ; Adults:  $0.90 > 0.55$ ). The Kruskal-Wallis rank sum test showed that the differences between the two constructions in each group were significant (KS:  $\chi^2(1)=13.06$ ,  $p<.001$ ; Grade 2:  $\chi^2(1)= 37.77$ ,  $p<.001$ ; Grade 4:  $\chi^2(1)=38.51$ ,  $p<.001$ ; Adults:  $\chi^2(1)= 92.27$ ,  $p<.001$ ).

**Table 4-1. Each Group’s Interpretations of the Two Constructions**

Group \ Construction	DS		BC		p-value
	M	SD	M	SD	
<b>KS</b>	0.43	0.41	0.66	0.22	0.0003019
<b>Grade 2</b>	0.76	0.33	0.51	0.20	7.949E-10
<b>Grade 4</b>	0.80	0.29	0.54	0.27	5.444E-10
<b>Adults</b>	0.90	0.16	0.55	0.19	<2.2E-16

Moreover, concerning each construction in the four groups, age differences were found. With respect to donkey sentences, from the mean scores of each group, there was a developmental pattern where the adults obtained the highest mean score ( $M=0.90$ ), followed by Grade 4 ( $M=0.80$ ), Grade 2 ( $M=0.76$ ) and KS ( $M=0.43$ ). This overall between-group difference was significant ( $\chi^2(3)=80.25$ ,  $p<.001$ ). Nevertheless, in terms of bare conditionals, KS ( $M=0.66$ ) had the highest mean score, while the older children (Grade 2 and Grade 4) and the adults received roughly the same mean scores (Grade 2:  $M=0.51$ ; Grade 4:  $M=0.54$ ; Adults:  $M=0.55$ ). This between-group difference was found significant as well ( $\chi^2(3)=17.48$ ,  $p<.001$ ).

Due to the fact that overall between-group differences for the two constructions respectively were found to be significant, the two-sample Wilcoxon tests were conducted for

pairwise comparisons, and the results are shown in Table 4-2.

**Table 4-2. The between-group Differences in DS and BC**

Construction	DS ( $\chi^2(3)=80.25, p<.001$ )			BC ( $\chi^2(3)=17.48, p<.001$ )		
	KS	Grade 2	Grade 4	KS	Grade 2	Grade 4
Grade 2	9.678E-09	---	---	5.781E-05	---	---
Grade 4	1.325E-10	0.395	---	0.004697	0.5971	---
Adults	3.092E-16	0.004136	0.04207	0.003365	0.192	0.5758

Note: The adjustment of  $p$ -values for six paired comparisons was .01<sup>1</sup>.

Concerning donkey sentences, the differences between Grade 2 and Grade 4 ( $p=.40$ ) and between Grade 4 and the adults ( $p=.04$ ) were found to be insignificant, while the differences between KS and Grade 2, between KS and Grade 4, between KS and the adults, and between Grade 2 and the adults were all significant ( $p<.01$ ). In terms of bare conditionals, the two-sample Wilcoxon tests identified significant differences among the comparisons between KS and Grade 2, between KS and Grade 4, and between KS and the adults ( $p<.01$ ). However, Grade 2, Grade 4 and the adults did not show significance for comparisons between one another (Grade 2-Grade 4:  $p=.60$ ; Grade 2-Adults:  $p=.19$ ; Grade 4-Adults:  $p=.58$ ).

Accordingly, KS obtained lower mean score and showed great differences between the older groups in donkey sentences. Though the mean score of Grade 4 increased comparing with that of Grade 2, no significant difference was found between the two groups. Moreover, Grade

<sup>1</sup> Since there were six pairwise comparisons – KS vs. Grade 2, KS vs. Grade 4, KS vs. Adults, Grade 2 vs. Grade 4, Grade 2 vs. Adults and Grade 4 vs. Adults – the adjusted  $p$ -value was  $.05/6 = .0084$ , and rounding it to the nearest hundredth was .01. Hence, if the result was a  $p$ -value of .04, it was counted as insignificant.

4 showed no significant difference from the adults, indicating that they had had an adult-like interpretation. For bare conditionals, Grade 2, Grade 4 and the adults tended to interpret them with more existential readings, but KS, in contrast, was not in the same vein as the older groups. This illustrated that the older groups had a unanimous tendency in that no absolute reading was assigned to bare conditionals, where KS had not acquired this tendency.

#### 4.1.2 Discussion

All the subjects' mean scores on the two constructions differed; hence, it is inferred that difficulty levels of the two constructions are not the same where the subjects found donkey sentences less challenging to interpret than bare conditionals. Accordingly, it can be concluded that donkey sentences and bare conditionals are not related constructions in terms of readings. Further investigation of the between-construction comparison for each group revealed that all the four groups also considered the two constructions have different degrees of universal and existential readings as well. This result can be explained by a syntactic approach.

Literature has argued that the two constructions are related due to the fact that the two share referentiality in common (Cheng & Huang 1996, Pan & Jiang 1997). For a donkey sentence, the pronoun can refer back to its antecedent, and for a bare conditional, *shei* 'who' in its consequent clause can also be anaphoric to the first *shei* 'who' in its antecedent clause. Hence, it is believed that the approach adopted to donkey sentences can also account for bare

conditionals. Cheng & Huang (1996) argue that it is the unselective binding approach that can be used to analyze both donkey sentences and bare conditionals, and such an approach leads bare conditionals to have universal readings. However, roughly only 0.50 of the mean scores on bare conditionals for Grade 2, Grade 4 and the adults indicate that half of the sentences were interpreted with universal readings and the other half existential readings. Hence, no clear tendency was found for either universal or existential readings, which is against Cheng & Huang (1996). Grade 2, Grade 4 and the adults, on the other hand, showed a clear tendency in interpreting donkey sentences, where the subjects interpreted these sentences based on quantifier types, supporting literature (Kanazawa 1994, Krifka 1996, Geurts 2002, Foppolo 2009). Hence, in terms of readings, the two constructions have different degrees of tendencies, indicating that the approach adopted to donkey sentences cannot be utilized to examine bare conditionals in Chinese. Due to this finding, the two constructions are not considered to be the same, supporting Wang (2007), who considers bare conditionals one type of relative clauses, and arguing against Cheng & Huang's (1996) analysis.

The overall within-group comparison between constructions illustrated that the subjects scored higher on donkey sentences than on bare conditionals, and that the difference was significant, indicating that donkey sentences are less challenging than bare conditionals for our subjects. Due to the fact that each donkey sentence exhibits only one reading, either universal or existential, it is regarded as being far from obscure (Kanazawa 1994, Champollion 2016). A

bare conditional, in contrast, contains *wh*-indefinites that need contexts to be explicitly interpreted (Dekker 2001, Herburger 2015); therefore, it is more ambiguous in that more than one readings are possible, which makes it more difficult to interpret.

In addition, a developmental pattern of age differences was found in donkey sentences where it was children older than those in the second grade (i.e., older than seven years old) that could have an adult-like intuition. This supports literature (Inhelder & Piaget 1958, Herburger 1997, Cohen 2001, Geurts 2003) which states that children between four and seven have difficulties interpreting quantificational sentences. Also, according to the Stages of Cognitive Development proposed by Piaget (1936), children between seven and eleven are at a concrete operational stage that they start thinking logically. Hence, it is not until children over seven years old that they find it unchallenging to interpret quantification.

Nevertheless, concerning bare conditionals, except KS, overall the older groups showed no differences in interpreting bare conditionals. The indefiniteness of a *wh*-word in a bare conditional is derived from its question form (Haspelmath 1997, Thuan & Bruening 2013). It has been found that additional derivations in word forms occur in an indefiniteness use from the question use; therefore, the question use is said to be the default form while the indefinite use is a derived one. In the process of acquisition, children must learn the default use firstly (i.e., the question use of *wh*-words) while the indefinite use later. Accordingly, it can be inferred

that KS was still in the process of learning the default use of *wh*-words, leading to the incongruity between KS and the older groups.

## **4.2 Construction-specific Factors: Quantifier Types and Parallelism**

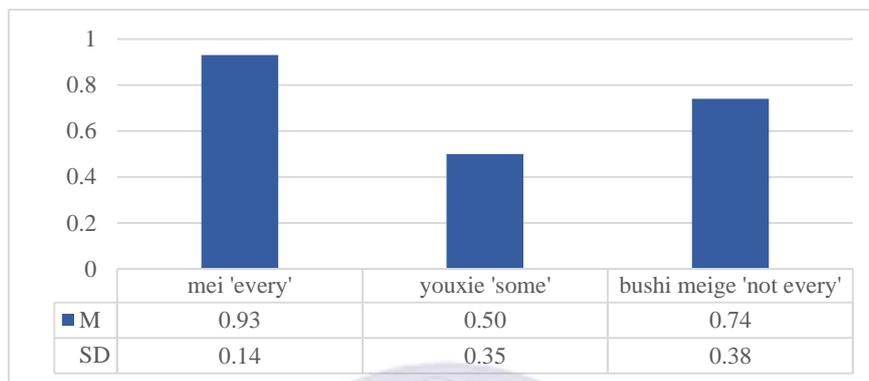
This section presents the construction-specific factors, which are quantifier types for donkey sentences and parallelism for bare conditionals, and the organization of the subsections is as follows: Section 4.2.1 is concerned with quantifier types, Section 4.2.2 illustrates the results of the other factor, parallelism, and lastly Section 4.2.3 provides a discussion about the two construction-specific factors.

### **4.2.1 Donkey Sentences: Quantifier Types**

As described in Section 4.1.1, mean scores were counted with the coding of the readings elicited by quantifier types for donkey sentences. *Mei* ‘every’ and *youxie* ‘some’ were coded according to Kanazawa (1994) with a universal reading and an existential reading, respectively. For the quantifier *bushi meige* ‘not every,’ Krifka (1996) and Geurts (2002) argue that it elicits a universal reading, yet examining the adults’ answers to this type of quantifier, we found that it was not such a case in Mandarin Chinese; hence, not following what literature has argued, an existential reading was assigned to sentences with *bushi meige* ‘not every.’

An overall comparison between quantifier types in all the four groups was examined, and

as illustrated in Figure 4-2, the subjects interpreted donkey sentences with the highest mean scores on *mei* ‘every,’ the second highest on *bushi meige* ‘not every,’ and the lowest on *youxie* ‘some.’



**Figure 4-2. Subjects’ Overall Interpretations of Quantifier Types in Donkey Sentences**

The overall between-type differences within the four groups were found ( $\chi^2(2)=116.78$ ,  $p<.001$ ), indicating the subjects identified the differences of quantifier types and found *mei* ‘every’ the easiest to interpret. To see more specifically the mean scores of quantifier types in each group, let’s take a look at Table 4-3, where significant differences between quantifier types were found (KS:  $\chi^2(2)=62.01$ ,  $p<.001$ ; Grade 2:  $\chi^2(2)=52.14$ ,  $p<.001$ ; Grade 4:  $\chi^2(2)=41.52$ ,  $p<.001$ ; Adults:  $\chi^2(2)=26.43$ ,  $p<.001$ ). In other words, each group interpreted the three quantifiers with existential and universal readings in different degrees.

**Table 4-3. Each Group’s Interpretations of the Three Quantifier Types**

Group \ Quantifier	<i>mei</i> ‘every’		<i>youxie</i> ‘some’		<i>bushi meige</i> ‘not every’		<i>p</i> -value
	M	SD	M	SD	M	SD	
<b>KS</b>	0.89	0.17	0.24	0.32	0.17	0.25	3.417E-14
<b>Grade 2</b>	0.94	0.12	0.42	0.33	0.91	0.16	4.758E-12
<b>Grade 4</b>	0.93	0.13	0.57	0.32	0.91	0.24	9.636E-10
<b>Adults</b>	0.95	0.10	0.78	0.18	0.97	0.10	7.229E-09

The four groups all interpreted *mei* ‘every’ with high mean scores, where the adults received the highest mean score, followed by Grade 2, Grade 4, and KS (Adults:  $M=0.95 >$  Grade 2:  $M=0.94 >$  Grade 4:  $M=0.93 >$  KS:  $M=0.89$ ). For *youxie* ‘some,’ only the adults received a high mean score ( $M=0.78$ ) while the three child groups obtained low mean scores (KS:  $M=0.24$ ; Grade 2:  $M=0.42$ ; Grade 4:  $M=0.57$ ), and for *bushi meige* ‘not every,’ Grade 2, Grade 4 and the adults all interpreted it with high mean scores (Grade 2:  $M=0.91$ ; Grade 4:  $M=0.91$ ; Adults:  $M=0.97$ ), yet the mean score of KS was quite low (KS:  $M=0.17$ ).

However, with a closer look at the means in each quantifier in the adults, in contrast to sentences with *mei* ‘every’ and *bushi meige* ‘not every’ ( $M=0.95, 0.97$ , respectively), a lower mean score in sentences with *youxie* ‘some’ was found ( $M=0.78$ ). As a result, a second look at this type is necessary.

Since *youxie* ‘some’ is an existential quantifier, supposedly it should elicit an existential reading as what literature has argued (Kanazawa 1994, Krifka 1996, Geurts 2002). For the four

task items designed for *youxie* ‘some,’ 78-100% of the subjects interpreted three of them with existential readings; nevertheless, Question 5 was answered with an existential reading by roughly only two thirds of the adults. It was this task item that lowered the mean scores of the *youxie* ‘some’ type. Question 5 was “*Youxie you maomi de nuren hen chongai maomi* ‘Some women who have a cat pamper it,’” and its pictures are shown in Figure 4-3.

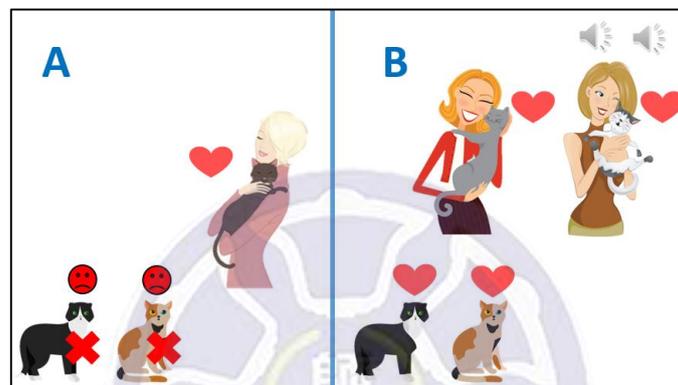


Figure 4-3. Question 5 in the DSII for *Youxie* ‘Some’

Picture A, which displayed an existential reading, was the correct answer to Q5, but only about 63% of the adults chose it correctly. This result might be due to pictorial ambiguity that caused such a low mean score. Picture B, which indicated a universal reading, was chosen where all crosses and hearts in the two pictures could be confusing and misleading as in Figure 4-3. It might be inferred that to the adults, only two people in Picture B could also indicate the idea of *youxie* ‘some,’ and the cats not hugged could also denote the idea of not being loved. As a result, in order to find out the differences in quantifier types with less flaw, the scores of this item were deleted in the four groups. The revised mean scores of each quantifier type and the

within-group comparisons in each group are presented in Table 4-4.

**Table 4-4. A Revision of Each Group’s Interpretations of the Three Quantifier Types**

Group \ Quantifier	<i>mei</i> ‘every’		<i>youxie</i> ‘some’		<i>bushi meige</i> ‘not every’		<i>p</i> -value
	M	SD	M	SD	M	SD	
<b>KS</b>	0.89	0.17	0.23	0.35	0.17	0.25	5.242E-14
<b>Grade 2</b>	0.94	0.12	0.48	0.37	0.91	0.16	1.809E-09
<b>Grade 4</b>	0.93	0.13	0.67	0.37	0.91	0.24	3.259E-05
<b>Adults</b>	0.95	0.10	0.88	0.18	0.97	0.10	0.01312

The revised mean scores of the *youxie* ‘some’ type increased in Grade 2, Grade 4 and the adults (Grade 2: M=0.48, Grade 4: M=0.67, Adults: M=0.88). Moreover, the revised scores for quantifier types were still found significantly different in each group (KS:  $\chi^2(2)=61.16, p<.001$ ; Grade 2:  $\chi^2(2)=40.26, p<.001$ ; Grade 4:  $\chi^2(2)=20.66, p<.001$ ; Adults:  $\chi^2(2)=8.67, p<.05$ ). Pairwise comparisons between quantifier types are illustrated in Table 4-5.

**Table 4-5. The between-type Differences in the Four Groups**

Group \ Quantifier	<i>mei</i> ‘every’ – <i>youxie</i> ‘some’	<i>mei</i> ‘every’ – <i>bushi meige</i> ‘not every’	<i>youxie</i> ‘some’ – <i>bushi meige</i> ‘not every’
<b>KS</b>	1.911E-10	1.462E-12	0.7075
<b>Grade 2</b>	6.68E-08	0.5263	3.723E-07
<b>Grade 4</b>	0.0001672	0.6518	0.0001992
<b>Adults</b>	0.05522	0.2016	0.0073

Note: The adjustment of *p*-values for three paired comparisons was .02<sup>2</sup>.

<sup>2</sup> Three pairwise comparisons – *mei* ‘every’ vs. *youxie* ‘some,’ *youxie* ‘some’ vs. *bushi meige* ‘not every,’ and *mei* ‘every’ vs. *bushi meige* ‘not every,’ – were needed; therefore, the adjusted *p*-value was  $.05/3 = .0167$ , and rounding it to the nearest hundredth was .02. Hence, if the result was a *p*-value of .04, it was counted as

The two-sample Wilcoxon tests indicated that KS, Grade 2, and Grade 4 interpreted *mei* ‘every’ and *youxie* ‘some’ significantly differently ( $p < .02$ ). In addition, except KS, where a significant difference was also found in the comparison between *mei* ‘every’ and *bushi meige* ‘not every’ ( $p < .02$ ), the other three groups showed significant differences between *youxie* ‘some’ and *bushi meige* ‘not every’ ( $p < .02$ ).

Concerning the developmental pattern for each quantifier, between-group comparisons were investigated with the use of the Kruskal-Wallis rank sum test. First, as seen in Table 4-6, it was found that there was no significant difference in sentences with the quantifier *mei* ‘every’ ( $\chi^2(3) = 2.72, p = .44$ ) for the subjects, who all interpreted donkey sentences with *mei* ‘every’ with universal readings.

**Table 4-6. The between-group Differences in the Three Quantifier Types**

Quantifier	<i>mei</i> ‘every’ ( $\chi^2(3) = 2.72, p = .44$ )			<i>youxie</i> ‘some’ ( $\chi^2(3) = 48.84, p < .001$ )			<i>bushi meige</i> ‘not every’ ( $\chi^2(3) = 93.62, p < .001$ )		
	KS	Grade 2	Grade 4	KS	Grade 2	Grade 4	KS	Grade 2	Grade 4
Grade 2	---	---	---	0.002008	---	---	7.277E-13	---	---
Grade 4	---	---	---	1.27E-05	0.03598	---	7.539E-12	0.4385	---
Adults	---	---	---	3.854E-10	3.676E-06	0.009154	4.811E-14	0.03538	0.1769

Note: The adjustment of  $p$ -values for six paired comparisons was .01.

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insignificant.

For the quantifier type *youxie* ‘some,’ the overall between-group differences were significant ( $\chi^2(3)=48.84, p<.001$ ), where comparisons between KS and Grade 2, KS and Grade 4, KS and the adults, Grade 2 and the adults, and Grade 4 and the adults were found significant as well ( $p<.01$ ). The only insignificant difference was the comparison between Grade 2 and Grade 4 ( $p=.04$ ), but the three experimental groups all showed significant distinctions from the adults, indicating that the three child groups did not interpret *youxie* ‘some’ with an existential reading in an adult-like way.

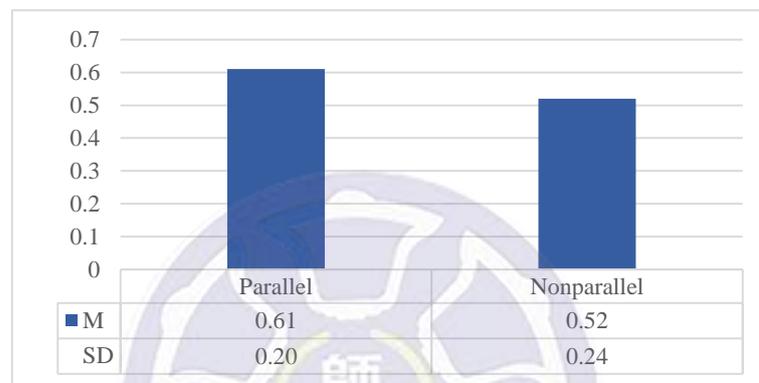
Last but not least, an overall between-group comparison for *bushi meige* ‘not every’ revealed a significant difference ( $\chi^2(3)=93.62, p<.001$ ). Between-group comparisons showed that Grade 2, Grade 4 and the adults were all significantly different from KS ( $p<.01$ ), and that the three older groups did not show significant differences (Grade 2-Grade 4:  $p=.44$ ; Grade 2-Adults:  $p=.04$ ; Grade 4-Adults:  $p=.18$ ). Hence, only KS did not assign existential readings to *bushi meige* ‘not every’ in donkey sentences.

#### **4.2.2 Bare Conditionals: Parallelism**

It has been found that quantifier types are related to donkey sentences, and this section is to see whether parallelism makes a difference in readings of bare conditionals. According to Cheng & Huang (1996), the unselective binding approach attributes bare conditionals to universal readings; therefore, bare conditionals, no matter in parallel or not, were coded with

universal readings.

To see whether parallelism was an influential factor, an overall between-type comparison was conducted. As presented in Figure 4-4, sentences with parallel *wh*-words were interpreted with higher mean scores than those with nonparallel *wh*-words ( $M=0.61 > 0.52$ ), showing that parallel bare conditionals were easier to interpret than nonparallel ones for the subjects.



**Figure 4-4. Subjects' Overall Interpretations of Parallelism Types in Bare Conditionals**

The Kruskal-Wallis rank sum test was conducted to examine the overall comparison, and found that the differences of mean scores in parallelism for the four groups was significant ( $\chi^2(1)=12.13, p<.001$ ). Hence, the degrees of the elicited universal readings of parallel and nonparallel bare conditionals were not the same, where parallel bare conditionals were significantly easier for the subjects to interpret with universal readings than nonparallel ones.

To look into the interpretations of each group more specifically, we conducted within-group comparisons between parallel and nonparallel sentences, as illustrated in Table 4-7. Overall, Grade 2, Grade 4 and the adults processed parallel sentences with universal readings

more than processing nonparallel ones (Grade 2:  $M=0.54 > 0.47$ ; Grade 4:  $M=0.65 > 0.43$ ; Adults:  $M=0.61 > 0.49$ ), while KS found sentences with nonparallel *wh*-words easier to interpret (KS:  $M=0.63 < 0.69$ ). The difference between the two types of bare conditional sentences was found significant in Grade 4 and the adults (Grade 4:  $\chi^2(1)=15.09, p<.001$ ; Adults:  $\chi^2(1)=7.26, p<.01$ ), but not in KS and Grade 2 (KS:  $\chi^2(1)=1.06, p=.30$ ; Grade 2:  $\chi^2(1)=2.12, p=.15$ ); hence, parallel and nonparallel sentences elicited universal readings in different degrees.

**Table 4-7. Each Group's Interpretations of the Two Parallelism Types**

Parallelism Group	Parallel		Nonparallel		p-value
	M	SD	M	SD	
<b>KS</b>	0.63	0.22	0.69	0.22	0.3027
<b>Grade 2</b>	0.54	0.17	0.47	0.21	0.1453
<b>Grade 4</b>	0.65	0.21	0.43	0.27	0.0001026
<b>Adults</b>	0.61	0.19	0.49	0.18	0.007048

On account of comparisons between groups for parallel sentences, the Kruskal-Wallis rank sum test showed that the difference was not significant ( $\chi^2(3)=6.21, p=.10$ ). In addition, for the between-group comparison in nonparallel sentences, the Kruskal-Wallis rank sum test indicated that the four groups exhibited mean scores significantly differently ( $\chi^2(3)=24.38, p<.001$ ). Thus, pairwise between-group comparisons were needed with the utilization of the two-sample Wilcoxon tests.

**Table 4-8. The between-group Differences in the Two Parallelism Types**

Parallelism	Parallel ( $\chi^2(3)=6.21, p=.10$ )			Nonparallel ( $\chi^2(3)=24.38, p<.001$ )		
	KS	Grade 2	Grade 4	KS	Grade 2	Grade 4
Grade 2	---	---	---	0.0002159	---	---
Grade 4	---	---	---	5.081E-05	0.2222	---
Adults	---	---	---	0.0002473	0.6917	0.04171

Note: The adjustment of  $p$ -values for six paired comparisons was .01.

As seen in Table 4-8, significant differences were found in the comparisons between KS and Grade 2 ( $p<.01$ ), between KS and Grade 4 ( $p<.01$ ) and between KS and the adults ( $p<.01$ ), while no difference was found between Grade 2, Grade 4 and the adults (Grade 2-Grade 4:  $p=.22$ ; Grade 2-Adults:  $p=.69$ ; Grade 4-Adults:  $p=.04$ ). This finding is due to the fact that most KS subjects interpreted nonparallel bare conditionals with universal readings significantly different from the other groups. Since they were unaware of the discrepancies of parallel and nonparallel sentence types, they tended to interpret both types of bare conditionals with universal readings, yet the older groups varied their interpretations based on parallelism types.

### 4.2.3 Discussion

The major finding about donkey sentences was that there was a type effect on the interpretation of quantifiers in donkey sentences. The distinction between universal and existential quantifiers was found in the interpretations of each type, supporting Kanazawa's Generalization (1994). *Mei* 'every' was the easiest to interpret, followed by *bushi meige* 'not

every' and *youxie* 'some.'

These results can be explained with a syntactic-semantic interface account. An operator of two anaphoric elements (i.e., a noun in the antecedent clause and the other in the consequent clause) binds them together and thus assigns a reading to the sentence. The operators of donkey sentences are of the three quantifier types, *mei* 'every,' *youxie* 'some' and *bushi meige* 'not every,' which have different degrees of saliency or explicitness that determines how strong a reading of a sentence can be. Mean scores of each type tell the saliency or explicitness of each quantifier. As a result, the subjects found *mei* 'every' to be the most salient or explicit one since all the four groups scored highly on this type; *bushi meige* 'not every' is the second explicit one, and finally *youxie* 'some' the least, which shapes a contrast with the other two quantifiers. Although both *youxie* 'some' and *bushi meige* 'not every' are both existential quantifiers, *bushi meige* 'not every' is more straightforward due to the existence of *bushi* 'not,' which has a negative feature, while *youxie* 'some' is more murky and relies on a person's subjective conscious to decide when to assign an existential reading to a sentence. Accordingly, the more explicit a quantifier is, the easier the interpretation of it is; thus, children consider sentences with *mei* 'every' and *bushi meige* 'not every' easier to interpret, and the ambiguous property of *youxie* 'some' takes time and experience to learn, leading it to be the most challenging one that hinders their acquisition.

For parallelism of bare conditionals, an overall between-type comparison found a type

effect where parallel sentences elicited universal readings more easily than nonparallel ones. This result is in support of Cheng & Huang (1996), who argue for parallelism in that when structures are in symmetry, readings are more easily to process.

Furthermore, a developmental pattern of acquisition was found in the two construction-specific factors. First, from a structural facet, symmetry plays a role when it comes to interpreting bare conditional sentences. Parallel bare conditionals are less challenging than nonparallel ones, where in the present study, only KS did not process nonparallel ones in an adult-like way. It is referred that children can easily master symmetric sentences; however they have difficulty interpreting asymmetric ones as adults do (Philip 1995, Xu 2012). Second, from a semantic aspect, the explicitness of an operator influences interpretations of quantification deeply. The idea of *mei* ‘every’ in donkey sentences is quite explicit, offering the subjects clear ideas of the amount of items it modifies, that is, totality of a set of items. *Ta* ‘he/she’ and *na-ge ren* ‘that person,’ which are put in the consequent clause of nonparallel bare conditionals, likewise, are more explicit in numbers, are more likely to be interpreted with existential readings. In contrast, *youxie* ‘some,’ *bushi meige* ‘not every’ and *wh*-words are less explicit and vaguer with no absolute number of entities involved; hence, they are more challenging to interpret (Katsos et al. 2016<sup>3</sup>). When it comes to acquisition, explicit ideas are easier to interpret

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<sup>3</sup> Katsos et al. (2016) investigated the effects of four different constraints on the acquisition of quantifiers in thirty-one languages. The four constraints include monotonicity, totality, complexity and informativeness of quantifiers that influence the sequence of acquisition. They found that the totality of *all* or *none* was firstly acquired than quantifiers like *some* and *most*, and this supports our results in that *mei* ‘every’, which also presents totality in quantification, was an easier quantifier to interpret and it was also the quantifier firstly acquired.

than vague ideas (Gentner & Toupin 1986). Hence, the explicit referentiality of *mei* ‘every’ is the most salient and the easiest to assign universal readings to donkey sentences, and nonparallel bare conditionals with concrete *ta* ‘he/she’ and *na-ge ren* ‘that person’ are easily to be interpreted with existential readings.

Since concepts of quantification are quite abstract, it can be acquired when children are as old as seven to eight years old (Simons & Keil 1995, Caramelli, Setti & Maurizzi 2004); as a result, KS, the preschoolers, only processed *mei* ‘every’ quite easily, while *bushi meige* ‘not every’ were not interpreted in an adult-like manner until the subjects were at seven years old, and only when they were at Grade 4 were they aware of the distinction between parallel and nonparallel bare conditionals. This explicitness could also explain the finding where KS interpreted nonparallel sentences with more universal readings than the older groups did. It can be reasoned that KS was still in the process of acquiring the indefiniteness use of *wh*-words; hence, they were unaware of the differences between parallel and nonparallel sentence types, yet the older groups, on the other hand, might have interpreted nonparallel sentences with existential readings due to the influence of the referentiality of the explicit *ta* ‘he/she’ and *na-ge ren* ‘that person.’ Therefore, the differences in explicitness of parallelism may cause the differences in interpretations for children at different ages.

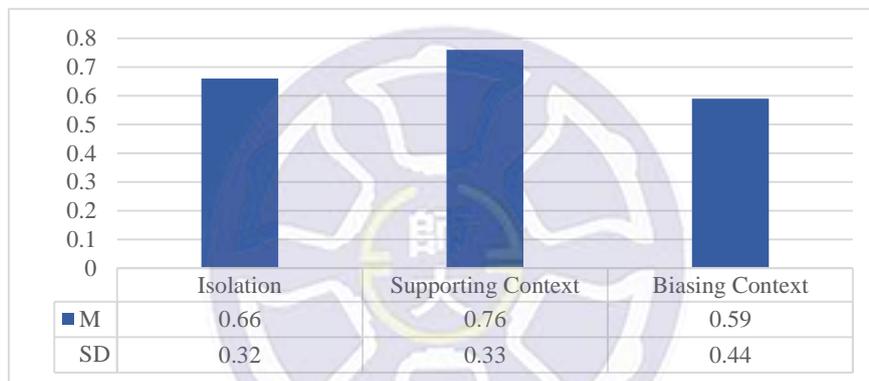
### 4.3 Contextual Effects

The third research question addresses the contextual effects on the two constructions.

Section 4.3.1 presents the overall findings of comparisons between contextual types in each group, and Section 4.3.2 is a discussion about the findings.

### 4.3.1 Overall Findings

An overall comparison between contextual types is presented in Figure 4-5, where the subjects scored the highest on sentences in supporting context, the second on sentences in isolation, and the least on sentences in biasing context ( $M=0.76 > 0.66 > 0.59$ ).



**Figure 4-5. Subjects' Overall Interpretations of the Contextual Types**

With the utilization of the Kruskal-Wallis rank sum test, an overall between-type difference within the four groups was found ( $\chi^2(2)=32.90, p<.001$ ). The two-sample Wilcoxon tests were used to examine pairwise comparisons; hence, as can be seen in Table 4-9, the comparisons between sentences in isolation and in supporting context, and between sentences in supporting and in biasing context were found significant ( $p<.02$ ).

**Table 4-9. The Overall between-type Differences**

<b>Context</b>	<b>Isolation – Supporting Context</b>	<b>Isolation – Biasing Context</b>	<b>Supporting Context – Biasing Context</b>
<b><i>p</i>-value</b>	1.808E-07	0.3489	1.591E-06

Note: The adjustment of *p*-values for three paired comparisons was .02<sup>4</sup>

Impacts of contextual types on donkey sentences and bare conditionals were taken into investigation respectively. Table 4-10 provides the between-type comparisons for donkey sentences.

**Table 4-10. Each Group’s Interpretations of DS in the Three Contextual Types**

<b>Group \ Context</b>	<b>Isolation</b>		<b>Supporting Context</b>		<b>Biasing Context</b>		<b><i>p</i>-value</b>
	<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>	<b>M</b>	<b>SD</b>	
<b>KS</b>	0.39	0.41	0.48	0.46	0.48	0.49	0.5722
<b>Grade 2</b>	0.75	0.34	0.81	0.33	0.81	0.38	0.1554
<b>Grade 4</b>	0.80	0.30	0.92	0.23	0.85	0.33	0.005361
<b>Adults</b>	0.95	0.14	0.97	0.12	0.89	0.27	0.1639

As seen in Table 4-10, the mean scores of KS, Grade 2 and Grade 4 were higher in both supporting and biasing contexts comparing to the scores on sentences in isolation. KS and Grade 2 did not show significant differences among the three contextual types (KS:  $\chi^2(2)=1.12$ ,  $p=.57$ ; Grade 2:  $\chi^2(2)=3.72$ ,  $p=.16$ ), while Grade 4 was the only group that showed a significant difference ( $\chi^2(2)=10.46$   $p<.01$ ). Since the mean score of Grade 4 greatly increased in supporting

<sup>4</sup> Three pairwise comparisons – in isolation vs. in supporting context, in isolation vs. in biasing context, and in supporting context vs. in biasing context – were needed; therefore, the adjusted *p*-value was  $.05/3 = .0167$ , and rounding it to the nearest hundredth was .02. Hence, if the result was a *p*-value of .04, it was counted as insignificant.

context, pairwise between-type comparisons for Grade 4 indicated that a significance was found in the isolation-supporting context comparison ( $p < .02$ ). The adults, on the other hand, received a higher mean score in supporting context only, but a lower score in biasing context; however, the between-type differences were not significant ( $\chi^2(2) = 3.62, p = .16$ ). Between-group comparisons in each contextual type are shown in Table 4-11.

**Table 4-11. The between-group Differences for DS in the Three Contextual Types**

Context	Isolation ( $\chi^2(3) = 57.71, p < .001$ )			Supporting Context ( $\chi^2(3) = 55.76, p < .001$ )			Biasing Context ( $\chi^2(3) = 31.05, p < .001$ )		
	KS	Grade 2	Grade 4	KS	Grade 2	Grade 4	KS	Grade 2	Grade 4
Grade 2	8.347 E-06	---	---	8.092 E-05	---	---	0.000 2902	---	---
Grade 4	8.465 E-07	0.595 4	---	8.017 E-08	0.056 22	---	2.856 E-05	0.584 1	---
Adults	3.466 E-12	0.000 4808	0.001 884	4.591 E-10	0.001 689	0.176 6	3.721 E-06	0.358 7	0.721 1

Note: The adjustment of  $p$ -values for six paired comparisons was .01.

Significant differences were found in the between-group comparisons of sentences in isolation ( $\chi^2(3) = 57.71, p < .001$ ), in supporting context ( $\chi^2(3) = 55.76, p < .001$ ), and in biasing context ( $\chi^2(3) = 31.05, p < .001$ ). The two-sample Wilcoxon tests reported that the three child groups all interpreted sentences in isolation significantly differently from the adults ( $p < .01$ ). KS showed significant differences from the two older groups respectively ( $p < .01$ ), while the Grade 2-Grade 4 comparison did not show any significance ( $p = .60$ ). In supporting context,

Grade 2 and Grade 4 did not show a significant difference ( $p=.06$ ), and only Grade 4 showed no significant difference from the adults ( $p=.18$ ), while Grade 2 and KS did ( $p<.01$ ). In biasing context, significant differences were found in the comparisons between KS and the older groups ( $p<.01$ ), but no difference was found in the comparisons between Grade 2 and Grade 4 ( $p=.58$ ), between Grade 2 and the adults ( $p=.36$ ) and between Grade 4 and the adults ( $p=.72$ ).

After reporting contextual effects on donkey sentences, let's look into the effects on bare conditionals as shown in Table 4-12, which reports the between-type comparisons.

**Table 4-12. Each Group's Interpretations of BC in the Three Contextual Types**

Group \ Context	Isolation		Supporting Context		Biasing Context		p-value
	M	SD	M	SD	M	SD	
KS	0.64	0.22	0.66	0.24	0.71	0.32	0.237
Grade 2	0.54	0.20	0.65	0.27	0.26	0.29	2.102E-07
Grade 4	0.56	0.25	0.69	0.32	0.29	0.28	1.756E-06
Adults	0.65	0.21	0.85	0.15	0.09	0.14	<2.2E-16

Except KS, who received the highest mean score on sentences in biasing context, the older child groups and the adults all obtained the highest mean scores on bare conditionals in supporting context, followed by sentences in isolation and those in biasing context. The differences of mean scores were found insignificant in KS ( $\chi^2(2)=2.88$ ,  $p=.24$ ), but significant in Grade 2, Grade 4 and the adults (Grade 2:  $\chi^2(2)=30.75$   $p<.001$ ; Grade 4:  $\chi^2(2)=26.50$   $p<.001$ ; Adults:  $\chi^2(2)=78.45$   $p<.001$ ). Accordingly, the two-sample Wilcoxon tests were used to explore their differences, as can be seen in Table 4-13.

**Table 4-13. The between-type Differences for BC in Each Group**

<b>Context Group</b>	<b>Isolation – Supporting Context</b>	<b>Isolation – Biasing Context</b>	<b>Supporting Context – Biasing Context</b>
<b>Grade 2</b>	0.04965	1.083E-05	1.089E-06
<b>Grade 4</b>	0.06565	8.287E-05	3.852E-06
<b>Adults</b>	7.147E-05	4.954E-13	4.8E-14

Note: The adjustment of *p*-values for three paired comparisons was .02.

All the three groups showed significant differences in the comparison between isolation and biasing contexts and between supporting and biasing contexts ( $p < .02$ ). The adults also showed a significant between-type difference in the comparison between isolation and supporting context ( $p < .02$ ).

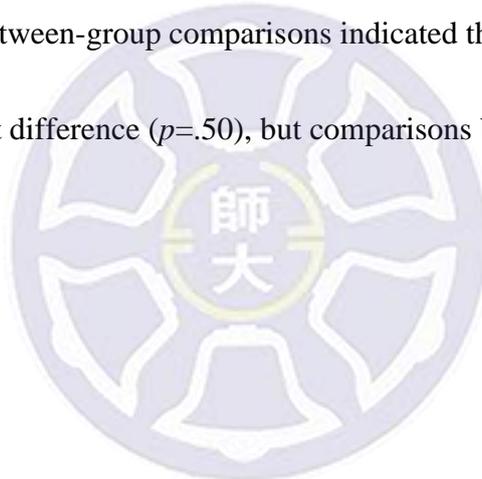
The pairwise between-group comparisons in sentences of the three contextual types is shown in Table 4-14.

**Table 4-14. The between-group Differences for BC in the Three Contextual Types**

<b>Context</b>	<b>Isolation</b> ( $\chi^2(3)=8.01, p=.05$ )			<b>Supporting Context</b> ( $\chi^2(3)=14.49, p<.01$ )			<b>Biasing Context</b> ( $\chi^2(3)= 56.16, p<.001$ )		
	<b>KS</b>	<b>Grade 2</b>	<b>Grade 4</b>	<b>KS</b>	<b>Grade 2</b>	<b>Grade 4</b>	<b>KS</b>	<b>Grade 2</b>	<b>Grade 4</b>
<b>Grade 2</b>	---	---	---	0.845 6	---	---	3.249 E-07	---	---
<b>Grade 4</b>	---	---	---	0.502 3	0.451 8	---	1.932 E-06	0.496 2	---
<b>Adults</b>	---	---	---	0.000 2297	0.000 4943	0.057 99	2.572 E-11	0.009 164	0.000 6525

Note: The adjustment of *p*-values for six paired comparisons was .01.

First, it was found that comparisons of mean scores in isolation were insignificant ( $\chi^2(3)=8.01$ ,  $p=.05$ ). However, a significant discrepancy was found in sentences in supporting context ( $\chi^2(3)=14.49$ ,  $p<.01$ ). The two-sample Wilcoxon tests showed that comparing with the adults, KS and Grade 2 each showed significant differences ( $p<.01$ ), but Grade 4 did not ( $p=.06$ ), and that the three experimental groups did not show significant difference between one another (KS-Grade 2:  $p=.85$ ; KS-Grade 4:  $p=.50$ ; Grade 2-Grade 4:  $p=.45$ ). For sentences in biasing context, a significance difference was found in the overall between-group comparison ( $\chi^2(3)=56.16$ ,  $p<.001$ ). Pairwise between-group comparisons indicated that only Grade 2 and Grade 4 did not display a significant difference ( $p=.50$ ), but comparisons between the other groups did ( $p<.01$ ).



#### **4.3.2 Discussion**

Previous studies have proposed that contexts are influential to interpretations of sentences with syntax-semantic interface (Prévost & Paradis 2004, Foppolo 2009, Ileri et al. 2012). In the present study, contextual effects on both donkey sentences and bare conditionals were found. Although concepts of quantification are abstract, providing context can offer children some clues and time to process target sentences. Nevertheless, the two constructions exhibit different degrees of explicitness in quantification, that is, *wh*-words in bare conditionals are less explicit than quantifier types in donkey sentences. Hence, different degrees of explicitness render

different degrees of contextual effects, where there were more significant effects on donkey sentences than on bare conditionals.

In donkey sentences, it was found that sentences in context helped the older child groups receive higher mean scores than sentences in isolation did. Regardless of supporting or biasing context, the older children interpreted donkey sentences more accurately. It can be reasoned that memory spans of children are limited; however, with contexts lengthening the span of time to figure out the situations of tasks, children can then interpret better with processing devices working more properly to interpret quantificational sentences. In this case, context suffices for interpreting the vague concepts (DeVault & Stone 2004); hence, children can answer donkey sentences better.

On the contrary, *wh*-words in bare conditionals are not as explicit as quantifiers in donkey sentences. Bare conditionals themselves are implicit and ambiguous that could not simply be resolved by the provision of context. As found in the mean scores of Grade 2, Grade 4 and the adults, their interpretations of bare conditionals were quite flexible, and easily influenced by context. It is worth noting that the adults' mean scores in both supporting and biasing contexts were highly affected by context. Since the expected readings for all bare conditionals were universal readings, the impact of context rendered a high mean score in supporting context but a very low score in biasing context. This difference can also be found in the older child group though its mean scores did not display as a huge difference as the adults. It can be reasoned

that Chinese is more a discourse-oriented language (Huang 1984, Ni 1987) and that readings of bare conditionals are more in a pragmatic matter (Dekker 2001, Herburger 2015) where their readings fluctuate on the basis of contexts; hence, when a factor determining a reading of a sentence is implicit and unpredictable, context can easily influence its reading.

In sum, context is certainly a crucial factor that helped the subjects obtain readings more easily and straightforwardly, no matter it was positive or negative contexts. Yet the explicitness of the operator that assigns a reading to a sentence matters. If the operator is explicit enough, like quantifiers, context functions as a synergy, enhancing mean scores and making sentences to be interpreted more easily; however, if the operator, like *wh*-words, is implicit, context will then dominate readings and thus children will easily be influenced by contextual clues.

For the developmental pattern for the contextual effects, the results show that our children over seven years old were keen to contextual clues; hence, they interpreted sentences with the influence of context. The child subjects under seven years old were not aware of contextual clues (Yatsushiro 2008) since they were still of the stages of learning and producing discourse (Pearson & de Villiers 2005). Preschoolers are still at a sentence level where decontextualized speech is often uttered especially when syntactically complex utterances are expressed (Tannen 1982); accordingly, children above seven years old can start appreciating context to infer readings of sentences.

#### 4.4 Age Effects

Language acquisition is a process that develops gradually by age; hence, age issue has been widely discussed when it comes to language acquisition. In the present study, it is to see children's interpretations of sentences that are concerned with quantification and to compare their behavior with that of the adults in order to understand their pattern of acquisition. The following pattern was found in this study, as in Table 4-15:

**Table 4-15. Children's Acquisition of Donkey Sentences and Bare Conditionals**

Group	Abilities
KS	<ul style="list-style-type: none"> <li>➤ Considering the two constructions not related with no adult-like intuition about DS or BC</li> <li>➤ Showing different interpretations of quantifier types in DS, and interpreting <i>mei</i> 'every' in an adult-like manner</li> <li>➤ Having adult-like readings of parallel BC</li> <li>➤ Being insensitive to all three context types in DS</li> <li>➤ Showing adult-like interpretations of BC in isolation</li> </ul>
Grade 2	<ul style="list-style-type: none"> <li>➤ Considering the two constructions not related but with an adult-like intuition only about BC but not about DS</li> <li>➤ Showing different interpretations of quantifier types in DS, and interpreting <i>mei</i> 'every' and <i>bushi meige</i> 'not every' in an adult-like manner</li> <li>➤ Having adult-like readings of parallel and nonparallel BC</li> <li>➤ Showing adult-like interpretations of DS in biasing context</li> <li>➤ Showing adult-like interpretations of BC in isolation</li> </ul>
Grade 4	<ul style="list-style-type: none"> <li>➤ Considering the two constructions not related with adult-like intuition about DS and BC</li> <li>➤ Showing different interpretations of quantifier types in DS, and interpreting <i>mei</i> 'every' and <i>bushi meige</i> 'not every' in an adult-like manner</li> <li>➤ Having adult-like readings of parallel and nonparallel BC and showing a clear distinction between the two types of parallelism</li> <li>➤ Showing adult-like interpretations of DS in biasing and supporting contexts</li> <li>➤ Showing adult-like interpretations of BC in isolation and in supporting context</li> </ul>

KS was aware that donkey sentences and bare conditionals were not related, but they had not obtained an adult-like pattern in interpreting these sentences. For instance, in donkey sentences, KS had already differentiated the three different quantifier types, but they only interpreted *mei* ‘every’ in an adult-like manner, but not *youxie* ‘some’ or *bushi meige* ‘not every.’ In bare conditionals, they only showed an adult-like interpretation of parallel bare conditionals but they did not distinguish between two types of parallelism. It has been found that children, especially under seven years old, had difficulties interpreting quantificational sentences (Herburger 1997, Cohen 2001, Geurts 2003). Even with context provided, KS was not sensitive to contextual clues and hence did not regard them as hints to interpret quantification.

Grade 2 might have perceived that donkey sentences and bare conditionals were not related regarding readings, but they only acquired an adult-like accuracy on bare conditionals. They showed quantificational interpretations of *mei* ‘every’ and *bushi meige* ‘not every’ both in an adult-like manner. Also, like the adults, when bare conditionals were either parallel or nonparallel, only roughly half of them obtained universal readings. In contrast to KS, Grade 2 was at the stage starting to be sensitive to context; hence, they had an adult-like intuition about donkey sentences in biasing context.

Grade 4 also showed that the two constructions were not so related, and they assigned an adult-like reading to both donkey sentences and bare conditionals. Concerning quantifier types,

Grade 4 interpreted sentences in different quantifiers with higher mean scores than KS and Grade 2, where sentences with *mei* ‘every’ and *bushi meige* ‘not every’ were both interpreted in an adult-like manner; but their mean score for *bushi meige* ‘not every’, though increased from KS and Grade 2 distinctively, had not reached an adult-like interpretation. For bare conditionals, Grade 4 showed an adult-like reading for both sentences in parallel and nonparallel *wh*-words, and they were able to acknowledge the differences between the two types of parallelism like the adults. They were also conscious of contextual clues since their mean scores showed they were affected by supporting contexts of donkey sentences and bare conditionals and by biasing context of donkey sentences as the mean scores of the adults illustrated. Overall, the subjects at this age had acquired mostly everything related to quantification, except the notion of *youxie* ‘some,’ which had not fully developed.

#### 4.5 Summary of Chapter Four

This chapter reports and analyzes the results of the present study. Regarding the factor of construction-relatedness, the two sentence constructions did not show relatedness in readings. Regarding construction-specific factors, quantifier types for donkey sentences and parallelism for bare conditionals, they both showed significant effects on readings. An additional proof of the two constructions not being related or identical was found when contextual clues were given, only the interpretations of bare conditionals were affected in biasing context, but those of donkey sentences stayed intact.

## Chapter Five

### Conclusion

The conclusion of the present study is reported in this chapter. Section 5.1 summarizes the major findings of this study, and Section 5.2 provides the limitations of the study and offers suggestions for future research.

#### 5.1 Major Findings

The present study explored children's first language acquisition of Chinese donkey sentences and bare conditionals in terms of interpretations. Several factors were put into design and the major findings are as follows.

First, previous research (Cheng & Huang 1996, Pan & Jiang 1997, Wang 2007) have argued about the relatedness of the two constructions, but no consensus has been reached. This research, on the other hand, offers some insights for this issue from an empirical viewpoint. In this present study, donkey sentences were found less challenging to interpret than bare conditionals, and this discrepancy was found significantly different; hence, the two constructions might not have perceived as related for our subjects. It is inferred that quantifier types in donkey sentences do not display as much vagueness as *wh*-indefinites in bare conditionals do.

Second, construction-specific factors, quantifier types for donkey sentences and

parallelism for bare conditionals, were found vital to interpretations. Supporting what literature (Kanazawa 1994) has stated, *mei* ‘every’ was found assigning universal readings to donkey sentences and *youxie* ‘some’ existential readings; however, *bushi meige* ‘not every’ was found eliciting existential readings, which were against what previous studies have argued (Krifka 1996, Geurts 2002). Moreover, the validity of parallelism of bare conditionals has been in dispute (Cheng & Huang 1996, Pan & Jiang 1997, Cheung 2007, Wang 2007), but the present study offered a piece of evidence from an empirical perspective for this factor. The results showed a significant difference in readings, where parallel bare conditionals were easier to interpret than nonparallel ones. This indicates that symmetry in sentence forms is an influential factor affecting interpretations of sentences like bare conditionals.

Third, contextual effects were found significant and affective to readings of both donkey sentences and bare conditionals. Context offered the subjects more time to ruminate about the readings; hence, no matter it was supporting or biasing, the subjects scored higher on donkey sentences in context than on those sentences in isolation. On the other hand, context for bare conditionals was dominant to interpretations as well but in a different way where the subjects’ mean scores increased in supporting context, but greatly decreased in biasing context.

Finally, a developmental pattern of children’s interpretations was found where overall KS, children at around five years old, had difficulty with quantification while Grade 2 was in the middle of the process and Grade 4 had interpretations almost like the adults did. Except the

reading of *youxie* ‘some,’ Grade 4 had obtained an adult-like intuition about quantification of donkey sentences and bare conditionals.

## 5.2 Limitations of the Present Study and Suggestions for Future Research

Three limitations are recognized in the present study and are recommended to take into consideration for future research.

First, the older child groups and the adults did not show a clear pattern in interpreting bare conditionals as they did in interpreting donkey sentences. Although this study followed previous research (Geurts 2002, Foppolo 2009) using acceptability tasks for the subjects to choose between two pictures, it is inferred that the acceptability of the test sentences might be affected by grammaticality; hence, variations of readings occurred. Moreover, picture illustrations could cause ambiguity that biased the subjects’ interpretations. As a result, future research can adopt grammaticality or interpretation tasks for children to complete to avoid these potential problems affecting interpretations.

Second, mean scores were counted based on literature in this study, yet it is more suitable to compare interpretations of sentence types on the basis of testing subjects’ preferences for readings. Therefore, frequency counts together with the *Chi*-squared test instead of mean scores can be used for statistical analysis for future research.

Last but not least, Grade 4 was found unable to interpret *youxie* ‘some’ in an adult-like

manner; hence, children over ten years old can be recruited in future research to further investigate a developmental pattern of children's acquisition of sentences with quantification.



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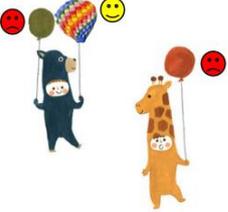
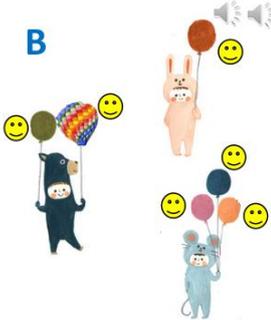
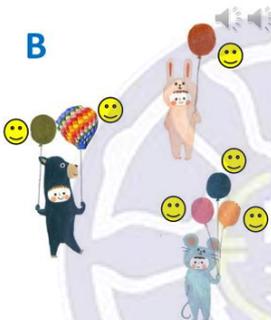
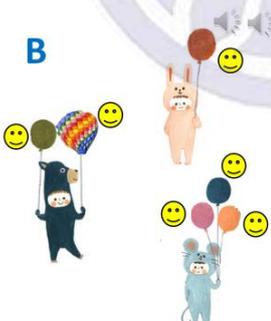
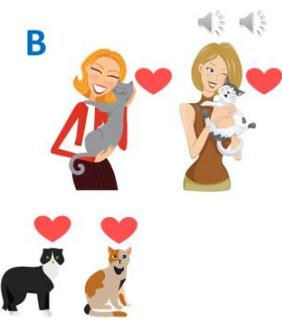
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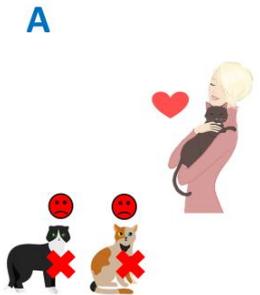
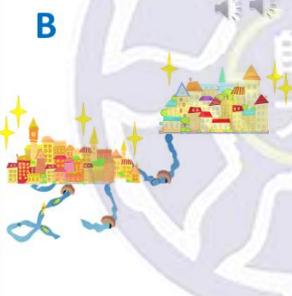
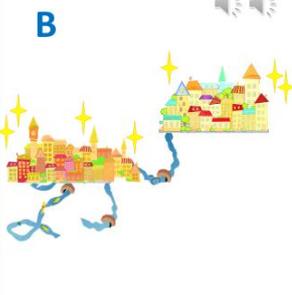
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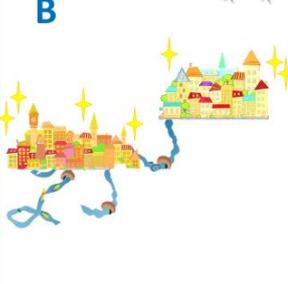
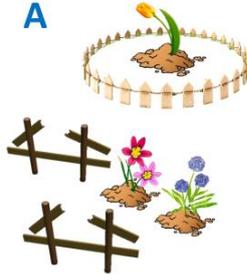
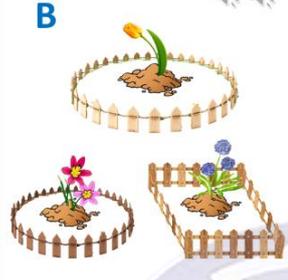
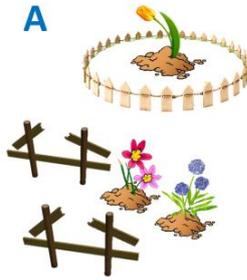
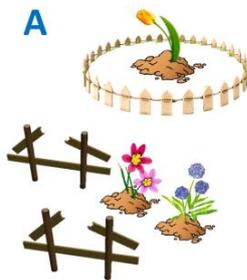
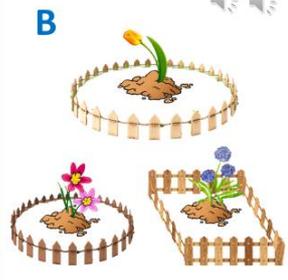
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## APPENDIX A

### Test Items Used in Donkey Sentences in Isolation (DSII)

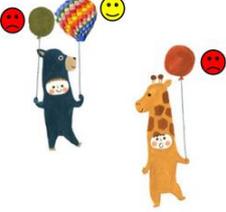
<p style="text-align: center;"><b>Q1:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>每個有氣球的小朋友都喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p style="text-align: center;"><b>Q2:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>有些有氣球的小朋友喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p style="text-align: center;"><b>Q3:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>不是每個有氣球的小朋友都喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p style="text-align: center;"><b>Q4:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q5:</b></p> <p>有些有養貓咪的人很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q6:</b></p> <p>不是每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q7:</b></p> <p>每個經過城市的河流都美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q8:</b></p> <p>有些經過城市的河流美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q9:</b></p> <p>不是每個經過城市的河流都美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q10:</b></p> <p>每個保護著花朵的木欄都圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q11:</b></p> <p>有些保護著花朵的木欄圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q12:</b></p> <p>不是每個保護著花朵的木欄都圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢?</p>

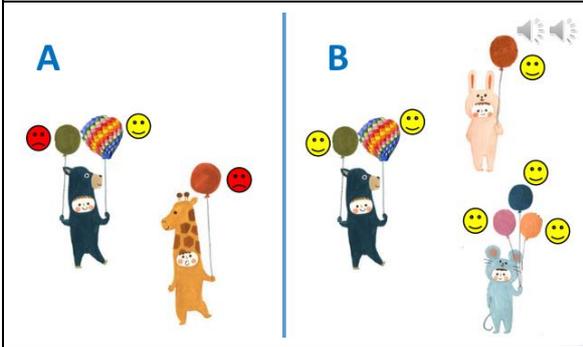
## APPENDIX B

### Test Items Used in Donkey Sentences in Context (DSIC)

<p><b>Q1:</b></p> 	<p>遊樂場的小丑很會做氣球，今天他做了一個特殊造型的氣球。</p>
	<p>小朋友都很想要那一個氣球。</p>
<p><b>A</b></p>  <p><b>B</b></p> 	<p>所以，每個有氣球的小朋友都喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q2:</b></p> 	<p>老師帶了很多不同的氣球來布置教室，但只有一顆是特別造型的氣球。</p>



有拿到這顆特別造型氣球的小朋友就很開心。

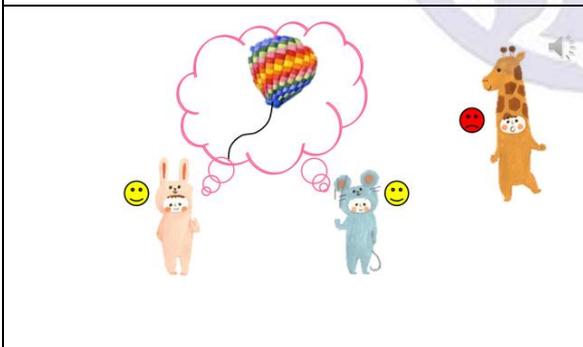


所以，有些有氣球的小朋友喜歡氣球。  
請問是圖片A還是圖片B是這句話的意思呢？

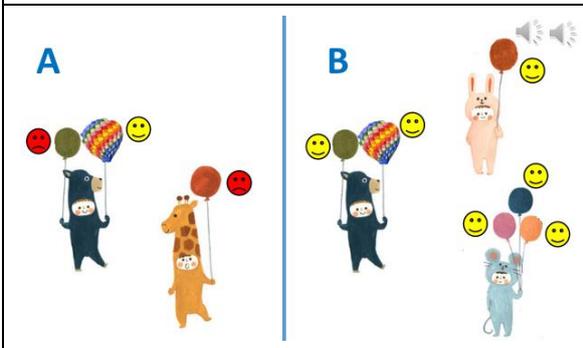
Q3:



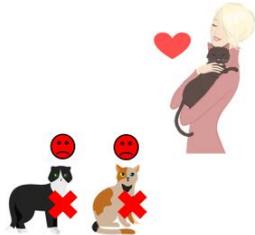
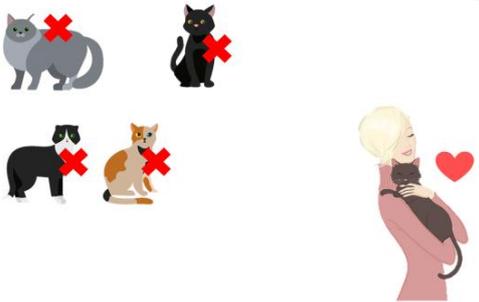
遊樂場的小丑很會做氣球，今天他做了一個特別造型的氣球。

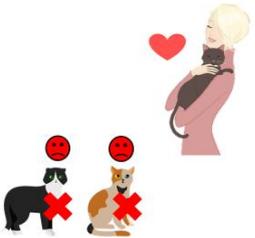
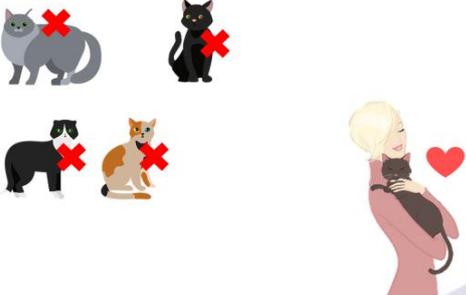
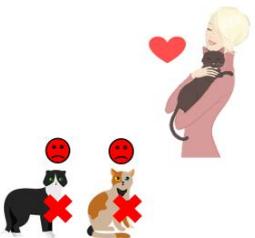


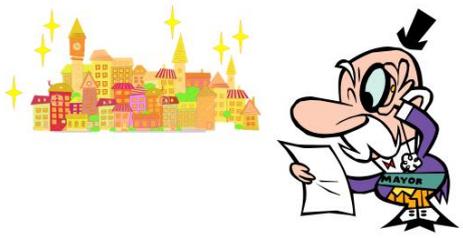
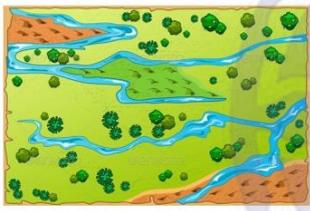
有兩個小朋友很想要那個氣球。



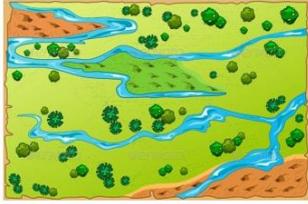
所以，不是每個有氣球的小朋友都喜歡氣球。  
請問是圖片A還是圖片B是這句話的意思呢？

<p>Q4:</p> 	<p>最近有很多人領養貓咪當寵物。</p>
	<p>不管是不是自己養的貓咪，他們每一隻都很喜歡。</p>
<p>A</p>  <p>B</p> 	<p>所以，每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p>Q5:</p> 	<p>最近有很多人養貓咪當寵物，有一兩位只喜歡自己養的貓咪。</p>
	<p>但大多數的人不管是不是自己養的貓咪，他們每一隻都很喜歡。</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，有些有養貓咪的人很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q6:</b></p> 		<p>最近有很多人養貓咪當寵物，有一兩位只喜歡自己養的貓咪。</p>
		<p>但大多數的人不管是不是自己養的貓咪，他們每一隻都很喜歡。</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，不是每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q7:</b></p> 		<p>寶島國有三條河流流經過很多城市。</p>

	<p>只有一位市長有好好規劃，讓他的城市因為河流流過，變的很漂亮。</p>
<div style="display: flex; justify-content: space-around;"> <div data-bbox="199 548 470 878"> <p><b>A</b></p>  </div> <div data-bbox="470 548 772 878"> <p><b>B</b></p>  </div> </div>	<p>所以，每個經過城市的河流都美化了城市。請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q8:</b></p> 	<p>水晶國有很多城市，每一個城市都有河流經過。</p>
	<p>但只有亮亮城市有注重清潔，所以亮亮城市很乾淨漂亮。</p>
<div style="display: flex; justify-content: space-around;"> <div data-bbox="199 1624 470 1951"> <p><b>A</b></p>  </div> <div data-bbox="470 1624 772 1951"> <p><b>B</b></p>  </div> </div>	<p>所以，有些經過城市的河流美化了城市。請問是圖片A還是圖片B是這句話的意思呢？</p>

Q9:



寶島國有三條河流流經過很多城市。



只有一位市長有好好規劃，讓河流流過的地方很漂亮。



所以，不是每個經過城市的河流都美化了城市。

請問是圖片A還是圖片B是這句話的意思呢？

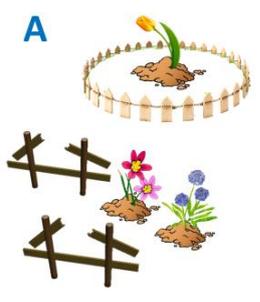
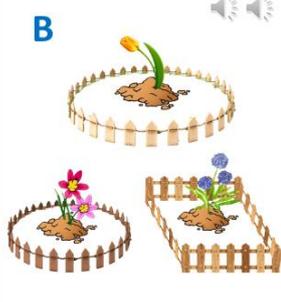
Q10:



媽媽很寶貝她種的花。

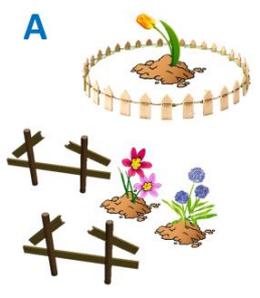
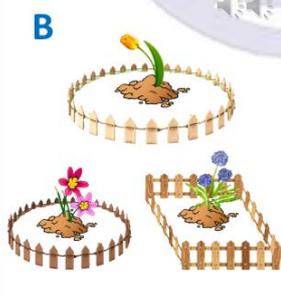


媽媽圍了木欄要保護他種的每一朵花。

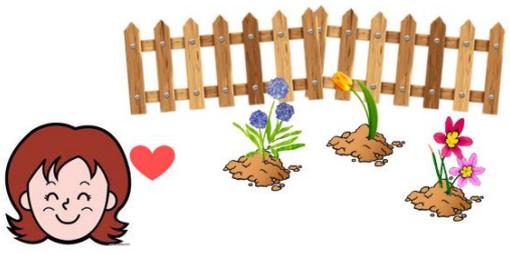
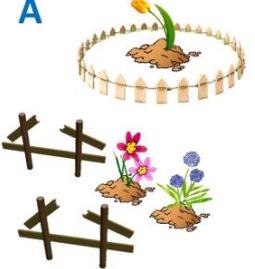
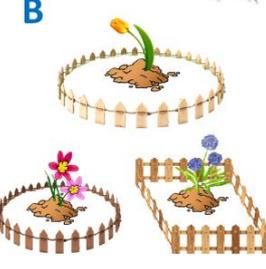
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，每個保護著花朵的木欄都圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q11:</b></p> 	<p>媽媽有好多木欄，但是有一兩個壞掉了。</p>
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	<p>木欄都是要拿來保護媽媽種的每一朵花。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，有些保護著花朵的木欄圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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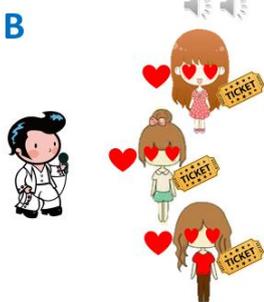
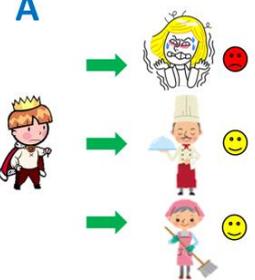
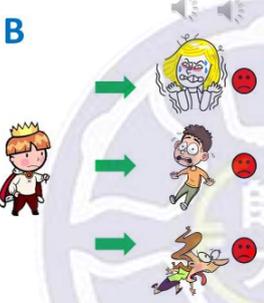
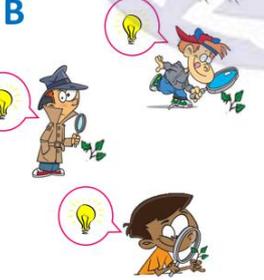
<p><b>Q12:</b></p> 	<p>媽媽有好多木欄，但是有一兩個壞掉了。</p>
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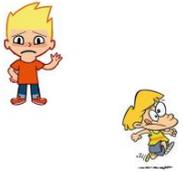
	<p>木欄都是要拿來保護媽媽種的每一朵花。</p>
<div style="display: flex; justify-content: space-between;"> <div data-bbox="204 577 475 869"> <p><b>A</b></p>  </div> <div data-bbox="491 577 767 869"> <p><b>B</b></p>  </div> </div>	<p>所以，不是每個保護著花朵的木欄都圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢？</p>

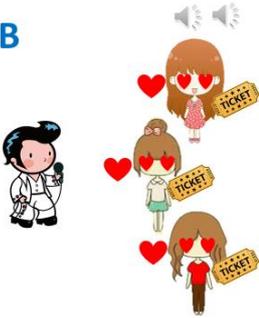
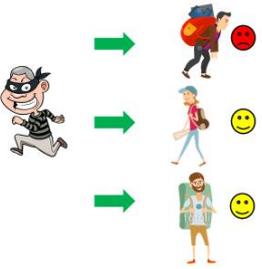
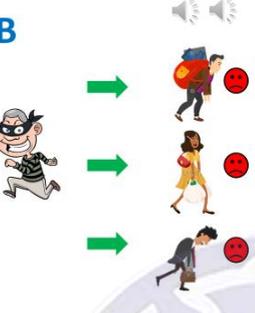
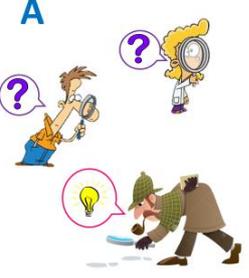
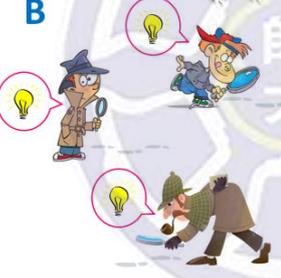
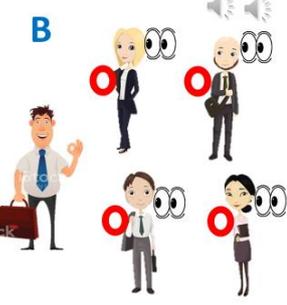


## APPENDIX C

### Test Items Used in Bare Conditionals in Isolation (BCII)

<p style="text-align: center;"><b>Q1:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>誰愛慕歌手，演唱會的門票就給誰。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p style="text-align: center;"><b>Q2:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>王子遇到了誰，誰就倒楣。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p style="text-align: center;"><b>Q3:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>誰有線索，誰就知道答案。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p style="text-align: center;"><b>Q4:</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>A</b></p>  </div> <div style="text-align: center;"> <p><b>B</b></p>  </div> </div>	<p>小花喜歡誰，我們就見誰。 請問是圖片A還是圖片B是這句話的意思呢?</p>

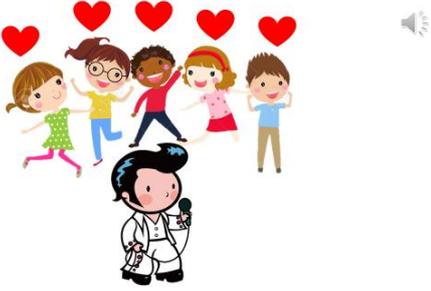
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q5:</b></p> <p>小明尋找誰，小美就採訪誰。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q6:</b></p> <p>大明找誰，誰就跑回家。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q7:</b></p> <p>誰起床，誰就寫封信。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q8:</b></p> <p>誰做蛋糕，老師就幫誰。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q9:</b></p> <p>誰愛慕歌手，演唱會的門票就給那個人。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q10:</b></p> <p>小偷遇到了誰，他就倒楣。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q11:</b></p> <p>誰有線索，那個人就知道答案。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q12:</b></p> <p>組長喜歡誰，老闆就見他。 請問是圖片A還是圖片B是這句話的意思呢?</p>

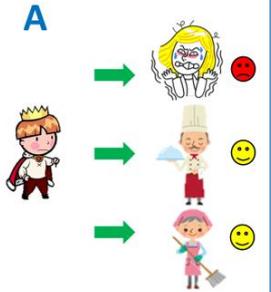
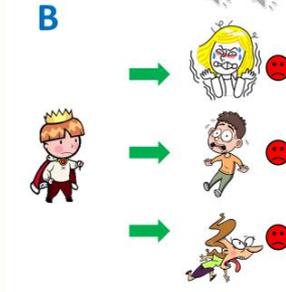
<p><b>Q13:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>爺爺尋找誰，記者就採訪那個人。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q14:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>老師找誰，他就跑回家。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q15:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>誰起床，那個人就寫封信。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q16:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>所以，老師說：誰做蛋糕，老師就幫他。 請問是圖片A還是圖片B是這句話的意思呢?</p>

## APPENDIX D

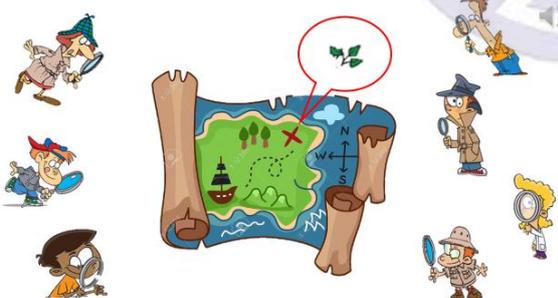
### Test Items Used in Bare Conditionals in Context (BCIC)

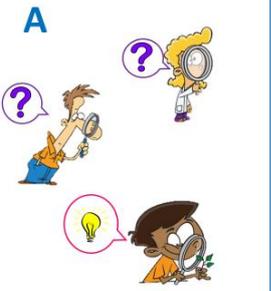
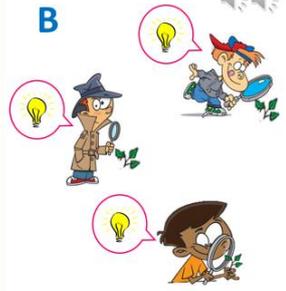
<p>Q1:</p> 	<p>有一位歌手很紅，很多人很喜歡他。</p>
	<p>歌手的經紀人有很多他的演唱會門票。</p>
<p>A</p>  <p>B</p> 	<p>經紀人說：誰愛慕歌手，演唱會的門票就給誰。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p>Q2:</p> 	<p>王子被魔女下了魔咒。</p>

	<p>只要王子一出去自己的房間，遇到的每一個人都會倒大楣。</p>
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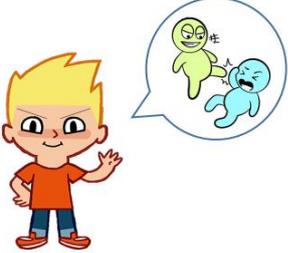
<div style="display: flex; justify-content: space-around;"> <div data-bbox="204 577 475 869"> <p><b>A</b></p>  </div> <div data-bbox="481 577 767 869"> <p><b>B</b></p>  </div> </div>	<p>所以，王子遇到了誰，誰就倒楣。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q3:</b></p> 	<p>老師準備了一個遊戲。</p>
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	<p>但遊戲只有一個線索，要讓全班同學搶那個線索。</p>
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<div style="display: flex; justify-content: space-around;"> <div data-bbox="204 1653 475 1944"> <p><b>A</b></p>  </div> <div data-bbox="481 1653 767 1944"> <p><b>B</b></p>  </div> </div>	<p>所以，誰有線索，誰就知道答案。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p style="text-align: center;"><b>Q4:</b></p> 	<p>小花很喜歡他的男朋友。</p>
	<p>小花帶男朋友讓小花的父母認識。</p>
<p><b>A</b></p>  <p><b>B</b></p> 	<p>因為小花的父母說：小花喜歡誰，我們就見誰。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p style="text-align: center;"><b>Q5:</b></p> 	<p>小明跟小美都是記者，兩個互相合作。</p>
	<p>小明負責找的每一個人，小美就會負責採訪他們。</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，小明尋找誰，小美就採訪誰。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q6:</b></p> 		<p>大明很喜歡欺負同學，所以大家都不喜歡跟他說話。</p>
		<p>下課了，他去找任何一位同學，他們都趕快跑回家。</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，大明找誰，誰就跑回家。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q7:</b></p> 		<p>聖誕節快到了，大家都搶著要寫信給聖誕老公公。</p>



但媽媽說早上第一位起床的小朋友才能寫信。

**A**

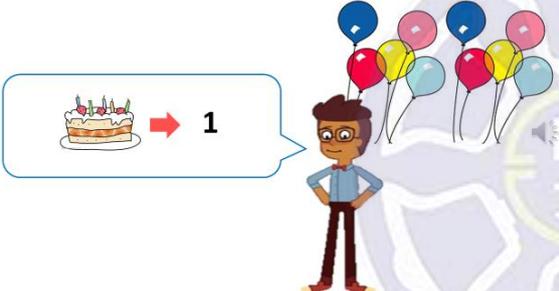


**B**



媽媽說：誰起床，誰就寫封信。  
請問是圖片A還是圖片B是這句話的意思呢？

**Q8:**



一年一度的同樂會到了，老師只要一位同學做蛋糕來跟大家分享。



但是蛋糕很難做。

**A**

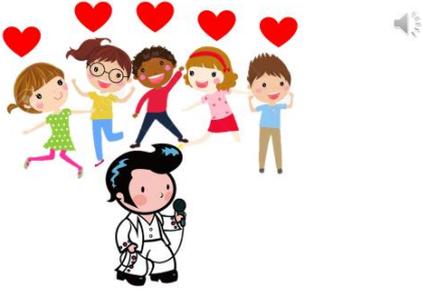


**B**



所以，老師說：誰做蛋糕，老師就幫誰。  
請問是圖片A還是圖片B是這句話的意思呢？

**Q9:**



有一位歌手很紅，很多人很喜歡他。



歌手的經紀人有很多他的演唱會門票。

**A**



**B**



經紀人說：誰愛慕歌手，演唱會的門票就給那個人。  
請問是圖片A還是圖片B是這句話的意思呢？

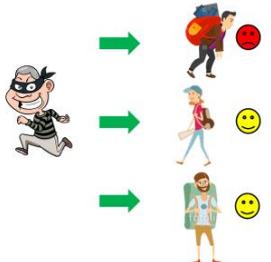
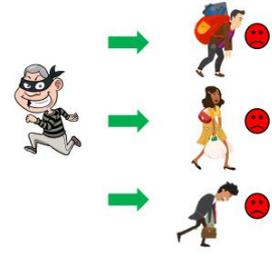
**Q10:**



小偷為了要躲警察，把偷來的錢放在小偷遇到的每一個人的包包裡。



警察正在找那些人。

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，小偷遇到了誰，他就倒楣。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q11:</b></p> 	<p>偵探們在辦案，尋找線索。</p>
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	<p>第一位找到線索的偵探就能破解謎底。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，誰有線索，那個人就知道答案。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q12:</b></p> 	<p>公司在招募新員工，但是只需要一位新員工。</p>
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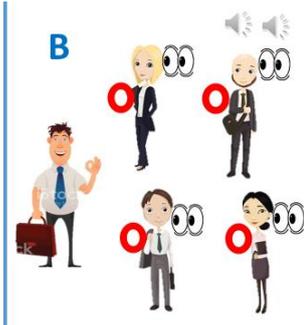


組長要趕快選一位，讓老闆認識這位新員工。

**A**



**B**



所以，組長喜歡誰，老闆就見他。  
請問是圖片A還是圖片B是這句話的意思呢？

**Q13:**



張爺爺想找以前的老師，記者想要幫他一起找。



張爺爺想問每一位同學，知不知道老師的消息。

**A**

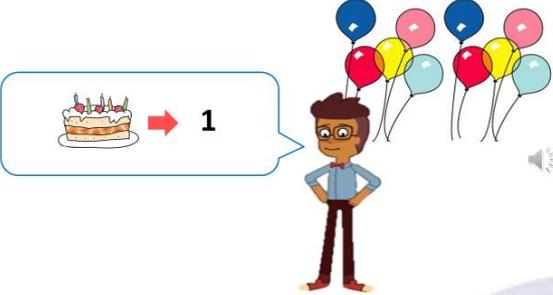


**B**



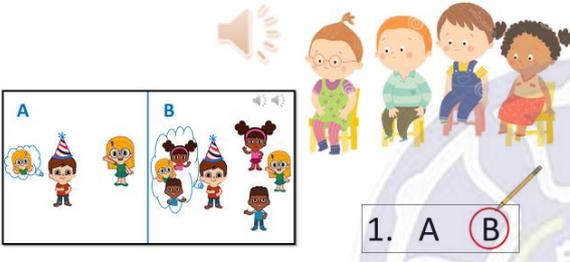
所以，爺爺尋找誰，記者就採訪那個人。  
請問是圖片A還是圖片B是這句話的意思呢？

<p><b>Q14:</b></p> 	<p>每次放學，老師都很喜歡找同學留下來打掃。</p>
	<p>同學們都不喜歡打掃，所以，大家一下課就跑回家。</p>
<p><b>A</b></p>  <p><b>B</b></p> 	<p>所以，老師找誰，他就跑回家。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q15:</b></p> 	<p>大家都很想念爺爺奶奶，媽媽要一位小朋友當代表，寫信給爺爺奶奶。</p>
	<p>媽媽說第一個起床的人可以幫大家寫信給爺爺奶奶。</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>媽媽說：誰起床，那個人就寫封信。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q16:</b></p> 		<p>一年一度的同樂會到了，老師只要一位同學做蛋糕來跟大家分享。</p>
		<p>但是蛋糕很難做。</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，老師說：誰做蛋糕，老師就幫他。 請問是圖片A還是圖片B是這句話的意思呢?</p>

## APPENDIX E

### Test Items Used in Sentences in Isolation

<p>第一題</p>  <p>Random (isolation)</p>	<p>第一大題</p>
 <p>1. A B</p>	<p>小朋友，等一下每一題，你們會聽到一個句子。聽完句子後，麻煩你們幫我選擇是圖片A還是圖片B最是這句話的意思哦！</p>
<p>Example 範例</p>	
	<p>今天生日派對，小明一想到同學，他就出現了。 請問是圖片A還是圖片B是這句話的意思呢？</p>

Questions 題去一'目口火`

Q1:

A



B



小明尋找誰，小美就採訪誰。  
請問是圖片A還是圖片B是這句話的意思呢？

Q2:

A



B



誰愛慕歌手，演唱會的門票就給誰。  
請問是圖片A還是圖片B是這句話的意思呢？

Q3:

A



B



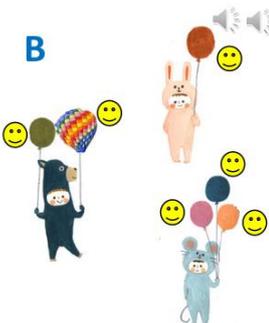
大明找誰，誰就跑回家。  
請問是圖片A還是圖片B是這句話的意思呢？

Q4:

A

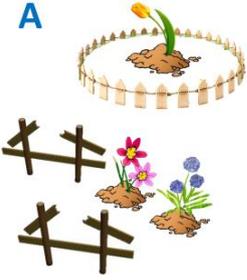
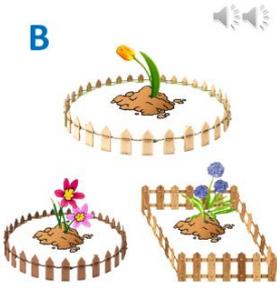
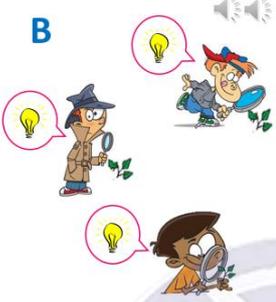
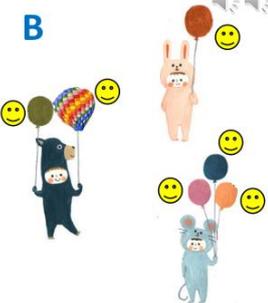


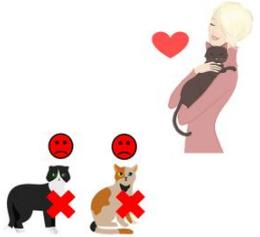
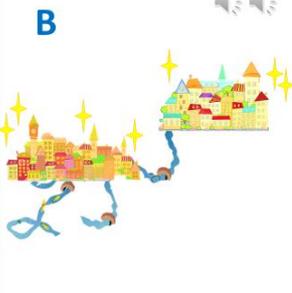
B

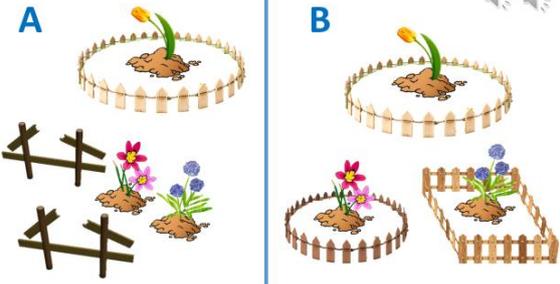
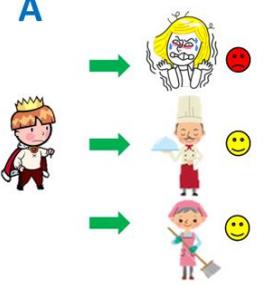
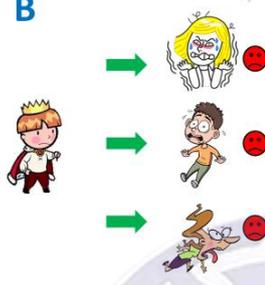
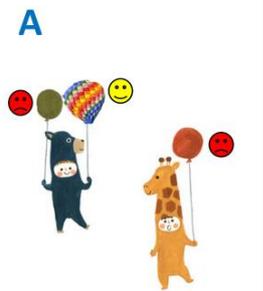
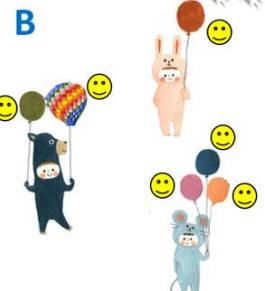


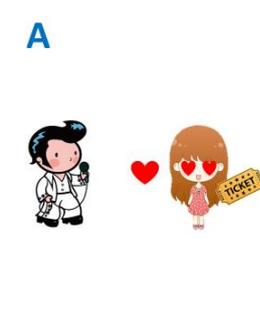
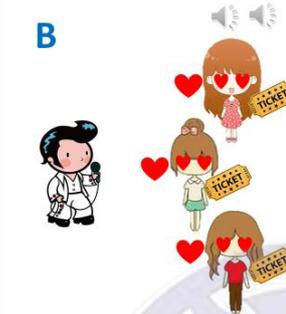
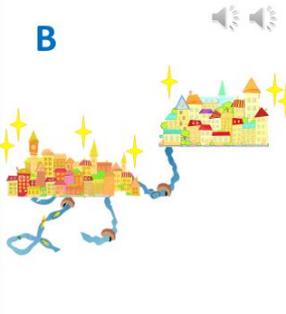
每個有氣球的小朋友都喜歡氣球。  
請問是圖片A還是圖片B是這句話的意思呢？

<p><b>A</b></p>	<p><b>B</b></p>	<p><b>Q5:</b></p> <p>有些有養貓咪的人很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p>	<p><b>B</b></p>	<p><b>Q6:</b></p> <p>小偷遇到了誰，他就倒楣。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p>	<p><b>B</b></p>	<p><b>Q7:</b></p> <p>誰起床，那個人就寫封信。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p>	<p><b>B</b></p>	<p><b>Q8:</b></p> <p>每個經過城市的河流都美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q9:</b></p> <p>有些保護著花朵的木欄圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q10:</b></p> <p>誰有線索，誰就知道答案。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q11:</b></p> <p>誰做蛋糕，老師就幫誰。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q12:</b></p> <p>有些有氣球的小朋友喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q13:</b></p> <p>不是每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q14:</b></p> <p>組長喜歡誰，老闆就見他。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q15:</b></p> <p>爺爺尋找誰，記者就採訪那個人。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q16:</b></p> <p>有些經過城市的河流美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>Q17:</b></p> <p><b>A</b></p> 	<p>不是每個保護著花朵的木欄都圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q18:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>王子遇到了誰，誰就倒楣。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q19:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>誰起床，誰就寫封信。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>Q20:</b></p> <p><b>A</b></p>  <p><b>B</b></p> 	<p>不是每個有氣球的小朋友都喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q21:</b></p> <p>每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q22:</b></p> <p>誰愛慕歌手，演唱會的門票就給那個人。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q23:</b></p> <p>老師找誰，他就跑回家。 請問是圖片A還是圖片B是這句話的意思呢?</p>
<p><b>A</b></p> 	<p><b>B</b></p> 	<p><b>Q24:</b></p> <p>不是每個經過城市的河流都美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>

**Q25:**

**A**

**B**

每個保護著花朵的木欄都圍著花朵。  
請問是圖片A還是圖片B是這句話的意思呢?

**Q26:**

**A**

**B**

小花喜歡誰，我們就見誰。  
請問是圖片A還是圖片B是這句話的意思呢?

**Q27:**

**A**

**B**

誰有線索，那個人就知道答案。  
請問是圖片A還是圖片B是這句話的意思呢?

**Q28:**

**A**

**B**

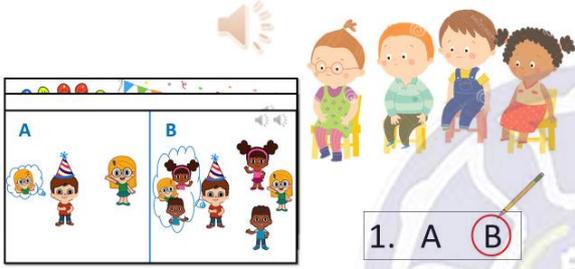
所以，老師說：誰做蛋糕，老師就幫他。  
請問是圖片A還是圖片B是這句話的意思呢?

第一大題結束！

第ㄅㄟ、一ㄟ大ㄅㄟ、題ㄅㄟ完ㄅㄟ成ㄅㄟ！◎  
下ㄟㄟ、次ㄟ、選ㄟ所ㄟ有ㄟㄟ  
第ㄅㄟ、二ㄟ、大ㄅㄟ、題ㄅㄟ、ㄟㄟ！  
加ㄟㄟ油ㄟㄟ！

## APPENDIX F

### Test Items Used in Sentences in Context

<p>第一題 二兒 大分 Y 題去一</p>  <p>Random (context)</p>	<p>第二大題</p>
 <p>1. A <input checked="" type="radio"/> B</p>	<p>小朋友，等一下每一題，你們會聽到一個小故事。聽完故事後，麻煩你們幫我選擇是圖片A還是圖片B最是最後一句話的意思哦！</p>
<p>Example 範例 例為一</p>	
	<p>媽媽幫小明邀請同學來參加小明的生日派對。</p>

	<p>但其實小明只想要小花來參加。</p>
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<div style="display: flex; justify-content: space-around;"> <div data-bbox="199 571 478 862"> <p><b>A</b></p>  </div> <div data-bbox="486 571 774 862"> <p><b>B</b></p>  </div> </div>	<p>今天生日派對，小明一想到同學，他就出現了。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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Questions 題去一'目口义'

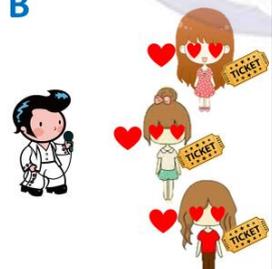
<p><b>Q1:</b></p> 	<p>小明跟小美都是記者，兩個互相合作。</p>
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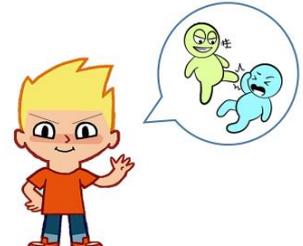
	<p>小明負責找的每一個人，小美就會負責採訪他們。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，小明尋找誰，小美就採訪誰。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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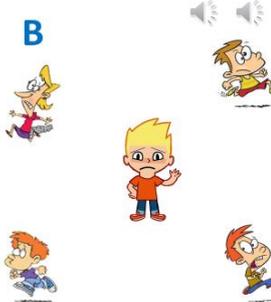
<p><b>Q2:</b></p> 	<p>有一位歌手很紅，很多人很喜歡他。</p>
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	<p>歌手的經紀人有很多他的演唱會門票。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>經紀人說：誰愛慕歌手，演唱會的門票就給誰。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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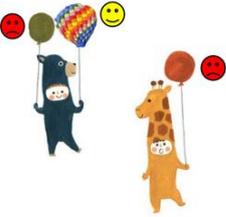
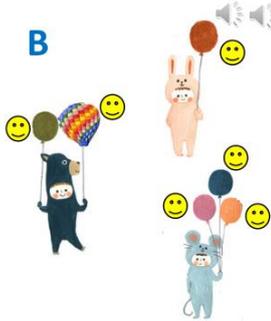
<p><b>Q3:</b></p> 	<p>大明很喜歡欺負同學，所以大家都不喜歡跟他說話。</p>
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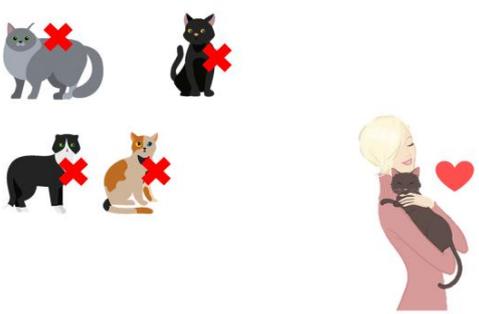
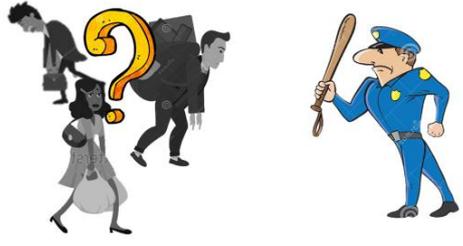
	<p>下課了，他去找任何一位同學，他們都趕快跑回家。</p>
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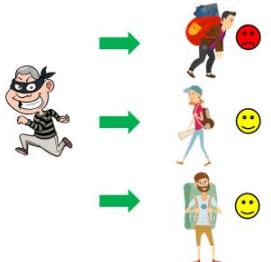
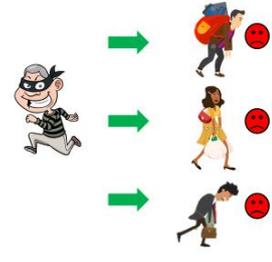
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，大明找誰，誰就跑回家。 請問是圖片A還是圖片B是這句話的意思呢?</p>
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<p><b>Q4:</b></p> 	<p>遊樂場的小丑很會做氣球，今天他做了一個特殊造型的氣球。</p>
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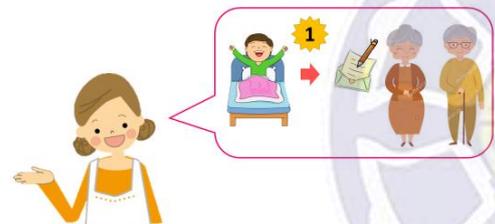
	<p>小朋友都很想要那一個氣球。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，每個有氣球的小朋友都喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢?</p>
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<p>Q5:</p> 	<p>最近有很多人養貓咪當寵物，有一兩位只喜歡自己養的貓咪。</p>
	<p>但大多數的人不管是不是自己養的貓咪，他們每一隻都很喜歡。</p>
<p>A</p>  <p>B</p> 	<p>所以，有些有養貓咪的人很寵愛貓咪。請問是圖片A還是圖片B是這句話的意思呢？</p>
<p>Q6:</p> 	<p>小偷為了要躲警察，把偷來的錢放在小偷遇到的每一個人的包包裡。</p>
	<p>警察正在找那些人。</p>

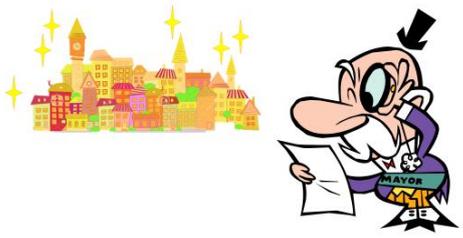
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，小偷遇到了誰，他就倒楣。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q7:</b></p> 	<p>大家都很想念爺爺奶奶，媽媽要一位小朋友當代表，寫信給爺爺奶奶。</p>
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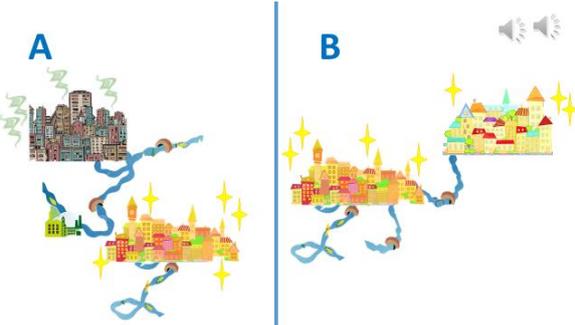
	<p>媽媽說第一個起床的人可以幫大家寫信給爺爺奶奶。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>媽媽說：誰起床，那個人就寫封信。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q8:</b></p> 	<p>寶島國有三條河流流經過很多城市。</p>
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只有一位市長有好好規劃，讓他的城市因為河流流過，變的很漂亮。



所以，每個經過城市的河流都美化了城市。請問是圖片A還是圖片B是這句話的意思呢？

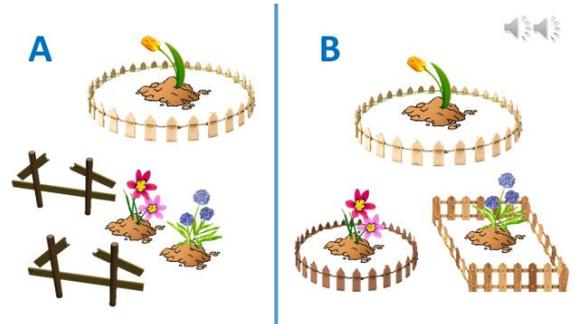
Q9:



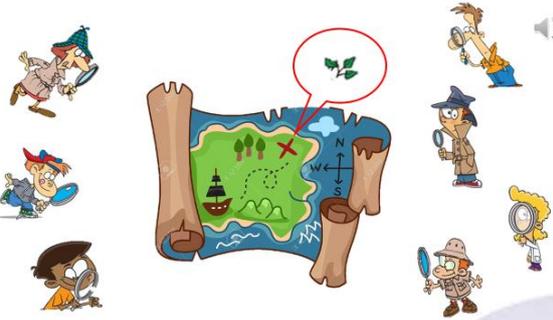
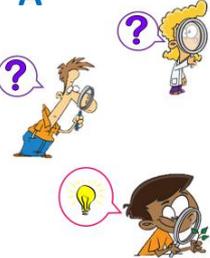
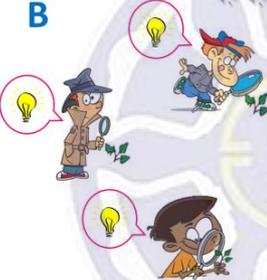
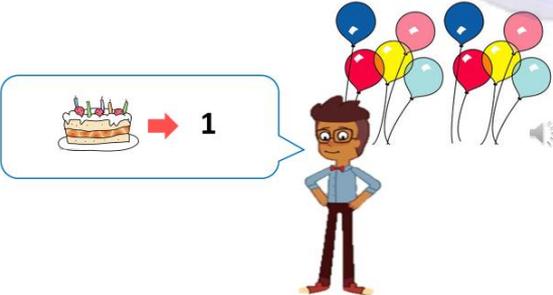
媽媽有好多木欄，但是有一兩個壞掉了。



木欄都是要拿來保護媽媽種的每一朵花。



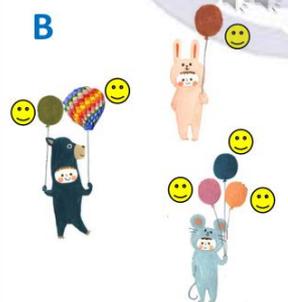
所以，有些保護著花朵的木欄圍著花朵。請問是圖片A還是圖片B是這句話的意思呢？

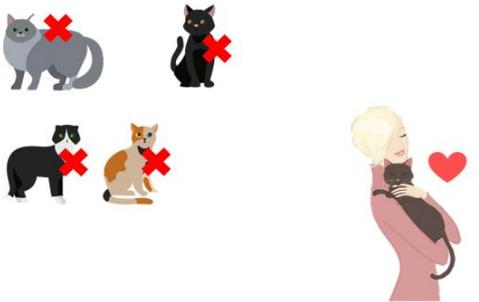
<p><b>Q10:</b></p> 	<p>老師準備了一個遊戲。</p>
	<p>但遊戲只有一個線索，要讓全班同學搶那個線索。</p>
<div style="display: flex; justify-content: space-around;"> <div data-bbox="204 958 475 1256"> <p><b>A</b></p>  </div> <div data-bbox="480 958 769 1256"> <p><b>B</b></p>  </div> </div>	<p>所以，誰有線索，誰就知道答案。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q11:</b></p> 	<p>一年一度的同樂會到了，老師只要一位同學做蛋糕來跟大家分享。</p>
	<p>但是蛋糕很難做。</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，老師說：誰做蛋糕，老師就幫誰。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q12:</b></p> 	<p>老師帶了很多不同的氣球來布置教室，但只有一顆是特別造型的氣球。</p>
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	<p>有拿到這顆特別造型氣球的小朋友就很開心。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，有些有氣球的小朋友喜歡氣球。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q13:</b></p> 	<p>最近有很多人養貓咪當寵物，有一兩位只喜歡自己養的貓咪。</p>
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	<p>但大多數的人不管是不是自己養的貓咪，他們每一隻都很喜歡。</p>
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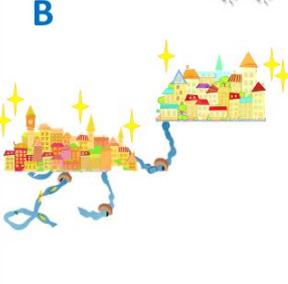
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，不是每個有養貓咪的人都很寵愛貓咪。請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q14:</b></p> 	<p>公司在招募新員工，但是只需要一位新員工。</p>
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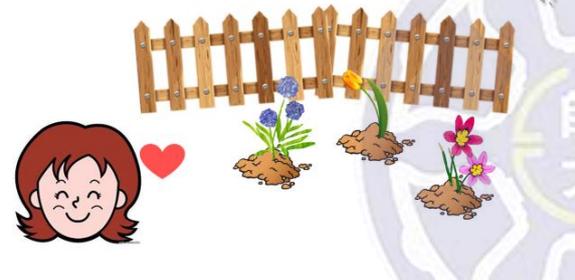
	<p>組長要趕快選一位，讓老闆認識這位新員工。</p>
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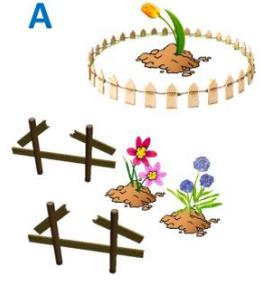
<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，組長喜歡誰，老闆就見他。請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q15:</b></p> 	<p>張爺爺想找以前的老師，記者想要幫他一起找。</p>
	<p>張爺爺想問每一位同學，知不知道老師的消息。</p>
<p><b>A</b></p>  <p><b>B</b></p> 	<p>所以，爺爺尋找誰，記者就採訪那個人。 請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q16:</b></p> 	<p>水晶國有很多城市，每一個城市都有河流經過。</p>
	<p>但只有亮亮城市有注重清潔，所以亮亮城市很乾淨漂亮。</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，有些經過城市的河流美化了城市。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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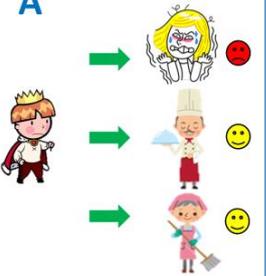
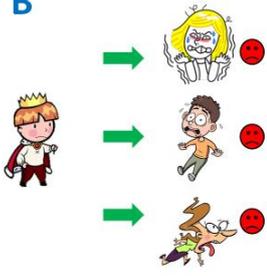
<p><b>Q17:</b></p> 	<p>媽媽有好多木欄，但是有一兩個壞掉了。</p>
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	<p>木欄都是要拿來保護媽媽種的每一朵花。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，不是每個保護著花朵的木欄都圍著花朵。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q18:</b></p> 	<p>王子被魔女下了魔咒。</p>
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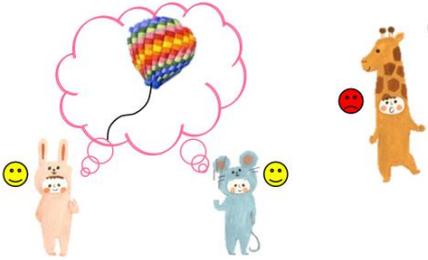
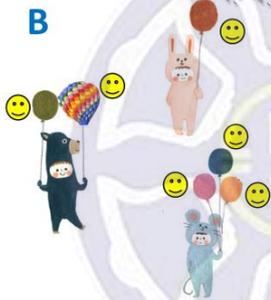
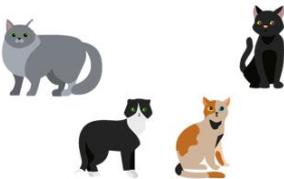
	<p>只要王子一出去自己的房間，遇到的每一個人都會倒大楣。</p>
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<p><b>A</b></p>  <p><b>B</b></p> 	<p>所以，王子遇到了誰，誰就倒楣。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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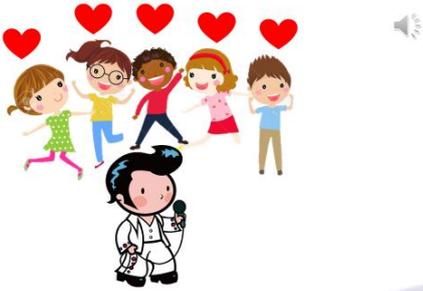
<p><b>Q19:</b></p> 	<p>聖誕節快到了，大家都搶著要寫信給聖誕老公公。</p>
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	<p>但媽媽說早上第一位起床的小朋友才能寫信。</p>
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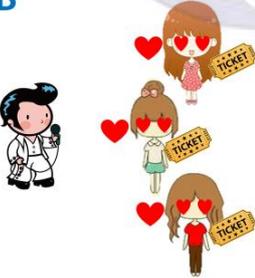
<p><b>A</b></p>  <p><b>B</b></p> 	<p>媽媽說：誰起床，誰就寫封信。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q20:</b></p> 	<p>遊樂場的小丑很會做氣球，今天他做了一個特別造型的氣球。</p>
	<p>有兩個小朋友很想要那個氣球。</p>
<p><b>A</b></p>  <p><b>B</b></p> 	<p>所以，不是每個有氣球的小朋友都喜歡氣球。請問是圖片A還是圖片B是這句話的意思呢？</p>
<p><b>Q21:</b></p> 	<p>最近有很多人領養貓咪當寵物。</p>
	<p>不管是不是自己養的貓咪，他們每一隻都很喜歡。</p>

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，每個有養貓咪的人都很寵愛貓咪。 請問是圖片A還是圖片B是這句話的意思呢?</p>
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<p><b>Q22:</b></p> 	<p>有一位歌手很紅，很多人很喜歡他。</p>
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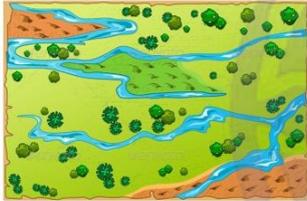
	<p>歌手的經紀人有很多他的演唱會門票。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>經紀人說：誰愛慕歌手，演唱會的門票就給那個人。 請問是圖片A還是圖片B是這句話的意思呢?</p>
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<p><b>Q23:</b></p> 	<p>每次放學，老師都很喜歡找同學留下來打掃。</p>
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	<p>同學們都不喜歡打掃，所以，大家一下課就跑回家。</p>
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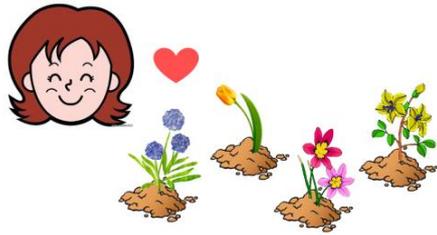
<div style="display: flex; justify-content: space-between;"> <div data-bbox="193 544 475 878"> <p><b>A</b></p>  </div> <div data-bbox="475 544 778 878"> <p><b>B</b></p>  </div> </div>	<p>所以，老師找誰，他就跑回家。 請問是圖片A還是圖片B是這句話的意思呢?</p>
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<p><b>Q24:</b></p> 	<p>寶島國有三條河流流經過很多城市。</p>
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	<p>只有一位市長有好好規劃，讓河流流過的地方很漂亮。</p>
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<div style="display: flex; justify-content: space-between;"> <div data-bbox="193 1619 475 1953"> <p><b>A</b></p>  </div> <div data-bbox="475 1619 778 1953"> <p><b>B</b></p>  </div> </div>	<p>所以，不是每個經過城市的河流都美化了城市。 請問是圖片A還是圖片B是這句話的意思呢?</p>
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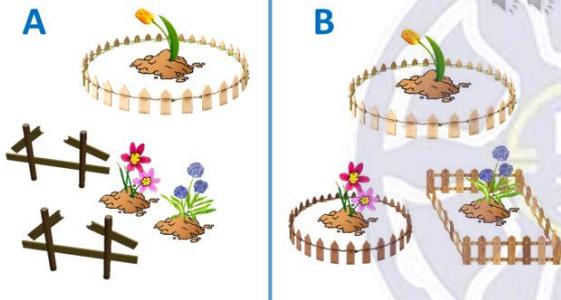
Q25:



媽媽很寶貝她種的花。



媽媽圍了木欄要保護他種的每一朵花。

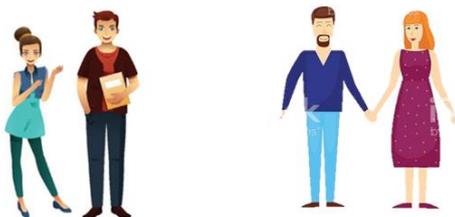


所以，每個保護著花朵的木欄都圍著花朵。  
請問是圖片A還是圖片B是這句話的意思呢？

Q26:



小花很喜歡他的男朋友。

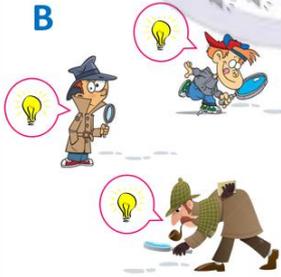


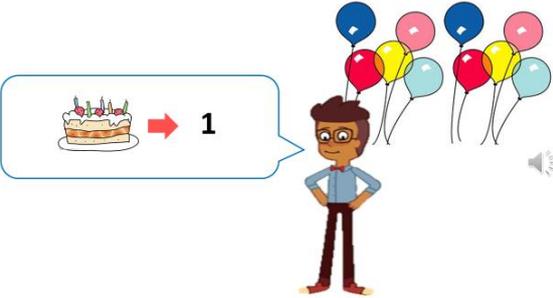
小花帶男朋友讓小花的父母認識。

<p><b>A</b></p> 	<p><b>B</b></p> 	<p>因為小花的父母說：小花喜歡誰，我們就見誰。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q27:</b></p> 		<p>偵探們在辦案，尋找線索。</p>
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	<p>第一位找到線索的偵探就能破解謎底。</p>
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<p><b>A</b></p> 	<p><b>B</b></p> 	<p>所以，誰有線索，那個人就知道答案。 請問是圖片A還是圖片B是這句話的意思呢？</p>
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<p><b>Q28:</b></p> 		<p>一年一度的同樂會到了，老師只要一位同學做蛋糕來跟大家分享。</p>
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但是蛋糕很難做。

**A**



**B**



所以，老師說：誰做蛋糕，老師就幫他。  
請問是圖片A還是圖片B是這句話的意思呢？

實驗結束！

Thank You 謝丁一せ、謝丁一せ、

The End

結リ一せ、束尸又、



## APPENDIX G

### Consent Form

親愛的家長，您好：

這是一份關於語言習得研究的同意書。本研究是國立臺灣師範大學英語系語言組的碩士論文。為了研究兒童的母語習得與發展，希望貴子弟協助回答問題。本研究目的在於了解兒童對「量詞相關句構」的理解，測驗地點將在兒童就讀的校園內進行，研究進行之優先原則為不影響學生上課權益。

測驗進行方式為在學校教室內讓小朋友看投影片回答問題。測驗分成兩階段，會分兩次完成。兩階段之題目均是選擇題，小朋友依照 PowerPoint 上之圖片作答。第一階段，小朋友會依據聽到的簡短句子，選擇哪張圖最是句子的意思。第二階段，小朋友會根據設計的故事情境回答問題。兩階段的實驗預計時間共約 80 分鐘。

為了感謝小朋友的參與，兩次測驗結束後，將贈送小朋友一份小禮物。本研究結果僅供學術研究使用，且參加測驗的小朋友個人資料絕不對外公開，所有答題資訊將謹守研究倫理嚴加保密。若 貴家長或老師想了解學生之測驗表現，亦可提供數據並加以說明，供教學參考。

衷心期盼 貴家長支持與協助本語言研究的進行，希望能夠獲得您的同意，在此獻上最誠摯的感謝。

敬祝

平安順心

學生姓名：\_\_\_\_\_

同意

不同意

家長簽名：\_\_\_\_\_

若您與小朋友同意參加此研究，敬請協助填寫以下問題：

小朋友生日：民國\_\_\_\_\_年\_\_\_\_\_月

國立臺灣師範大學英語研究所語言學組

研究生：林韋伶 敬上

指導教授：陳純音教授

日期：中華民國一〇六年十月