ACQUIRING SCOPE: A LONGITUDINAL STUDY[*]

Miao-Ling Hsieh

ABSTRACT

Based on the spontaneous data of a Chinese-speaking child collected from 1 year old up to 4+ years old, this study focuses on the development of his scope by examining the scope interaction between negation and quantified NPs that occur in preverbal positions. It is found that the child is sensitive to scope at 3;2, an age much earlier than the age reported in other studies (e.g., age of 6 in Lee 1991). Further evidence shows that the child has mastered scope of negation and scope in general at the age of 4. First, starting from age 4;3, the child has managed to mark universal quantifiers and *wh*-phrases as well as duration phrases occurring in the preverbal position with scope markers such as *dou* 'all' and *you* 'have'. Second, by the age of 4;5, the child has placed duration phrases in target positions in relation to negation.

Key words: acquisition of scope, negation, quantified NPs, duration phrase

1. INTRODUCTION

This paper studies the development of a child's scope, focusing on the interaction between negation and quantified NPs (QNP) that occur in preverbal positions. QNPs such as *every boy* and *two boys* interact with each other and with other quantificational elements such as negation,

---

exhibiting scope relations (e.g., Quine 1960, Keenan 1971, among others). A good number of studies in QNPs have contributed greatly to our outstanding of their interaction and the acquisition of scope possibilities in both Chinese and English, some of which will be reviewed in Section 2. However, the vast majority of studies on the acquisition of scope take the form of experiments designed to test children's comprehension of ambiguous sentences and most studies on children's comprehension of quantified expressions, as pointed out in Brooks and Braine (1996), have focused exclusively on children's comprehension of the universal quantifier *every*. Moreover, according to Musolino (to appear), relatively few have examined interactions involving QNPs and negation. Three studies available, i.e., Musolino (2000) and Su (2001, to appear), will be reviewed in Section 3.

The fact that comprehension dominates this area of study is also evident in a review by Thomas Lee of the literature on language acquisition (C.-T. Huang and Li 1996). No studies on production are discussed. The preference for comprehension as compared to production, however, should not be surprising as it is difficult to design experiments that elicit more than one quantifier in one sentence.

Even the experiments specifically designed for production such as Kwak (2006) are problematic for the reason that the child subjects and the control adult group produce only few negative sentences containing numeral NPs, preferring instead to use the corresponding affirmative sentences.

Presumably, it is also hard to find two quantifiers occurring in a sentence in the spontaneous data because the frequency of such occurrence may be very low and it may be still difficult to have a whole picture of the interaction of quantifiers, if, indeed, any is found at all.[1] This difficulty is also even greater if the spontaneous data are collected within a short period of time, e.g., under less than one year, and in a fixed context, e.g., the child subject is interviewed by the experimenter

---

[1] The appearance of a QNP in a sentence is, nevertheless, quite early.

(i) a. I drank *all grape juice.* (Eve, 1;10)
    b. *Two knife* out the box. (Eve, 1;11)
    c. Then Eve have *some milk.* (Eve, 1;11)
    d. Because there *no pictures.* (Eve, 2;1)
       (*Eve, Brown Corpus, CHILDES database*, cited in Musolino (to appear))

either at the child's home or in a lab. Under such a design, it is conceivable that no or few sentences with more than one quantifier are found because such contexts do not usually call for such usage.

Last but not least, child subjects in the studies related to the interaction of QNPs are usually older than 4 years of age due to the complexity of the experiments. For example, the Truth Judgment Task (Crain and Thornton 1998), which is often used for the test of scope, requires a child to judge a statement made by a puppet about what happens in the story presented to him/her. The child has to decide whether the statement is true or false based on the information in the story. This may not be an easy task for children younger than 4, as suggested in Su's (to appear) study.

In contrast, the study presented in this paper uses spontaneous data and is free from the above problems. First, the data used are part of an ongoing study that has so far lasted more than three years. The child, born on October 31st, 2003, is my son and he has been video-taped every other week from one year old up to 4+ years old for about 50 minutes for each session. Second and more importantly, the majority of the data quoted in this study are taken from my diaries about the child, which include detailed notes of how sentences were used in context. As it will be clear later, the context is crucial for the understanding of how a QNP is interpreted in the child's speech.

It is noticeable from the data collected that quite a few of the sentences involve a QNP and a negative marker, marking different stages of development in scope. The examples can be divided into two types, as shown in (1). The first one involves an indefinite subject introduced by the auxiliary *you* 'have' (C.-T. Huang 1990)[2] and a negative marker, while the second one involves a numeral object and a negative marker.

---

[2] An indefinite NP in Chinese cannot occur as the subject of a stative verb such as *shanchang* 'good at' if it is not introduced by *you* 'have,' as shown in (i).

(i)　　a.　*You yi ge ren* hen shanchang dalie. (Chen 2004:1169)
　　　　　　have one CL person very good:at hunt
　　　　　　'Someone is a good hunter.'
　　　b.　**Yi ge ren* hen shanchang dalie. (Chen 2004:1169)
　　　　　　one CL person very good:at hunt

This contrast is discussed in Cheng (1997) and Tsai (1994), where they, following the lines of Heim (1982) and Diesing (1992), claim that indefinites in Chinese lack inherent

(1) a. *You ren bu* zai. (2;11)
         have person not in
         'No one is in.'
     b. *Liang ge bu* yao. (2;10)
         two CL not want
         'I don't want two.'

In both examples, the negative marker *bu* is the target form for negating a state. The example in (1a) was uttered by the child in his play tent when his sister asked him whether anyone was in the tent:[3]

(2) Sister: *You ren* zai jia ma?
              have person in home PART
              'Is anyone home?'
     Child: *You ren* bu zai. (2;11) (cf. *Mei you ren* zai.)
              have person not in   not have person in
              'No one is in.'

In (2), the combination of the auxiliary *you* and *ren* in the sister's speech has a non-specific interpretation. Instead of the adult answer as also given in (2) for the sake of comparison, where *mei you ren* yields the 'no one' interpretation, the child responded with *you ren bu zai*. The use of *you ren* in the child's speech is non-specific, the interpretation available under the scope of negation, question or an intensional context. It is unlikely that the child would use *you ren* in this case to specifically refer to anyone. A similar situation took place as follows:

---

quantificational force, and are thus variables that need to be bound, rather than quantifiers. The binding requirement is satisfied by *you* in (ia), but not in (ib).

On the other hand, *you* is not required when a numeral subject is quantity-denoting (cf. Li 1998):

(ii) Yi zhang chuang keyi shui liang ge ren.
      one CL bed can sleep two CL person
      'A bed can accommodate two people.'

[3] The abbreviations used in the glosses are as follows:
ASP: aspect marker, BA: the object maker *ba*, CL: classifier, DE: the modificational marker *de*, PART: particle.

(3)   Child: *You ren bu* zai. (3;0)
                  have person not in
                  'No one is in.'
      Mother: Shei bu zai?
                  who not in
                  'Who is not in?'
      Child: *You ren bu* zai.
                  have person not in
                  'No one is in.'

The child used *you ren bu zai* in (3) to mean no one was in his sister's room. Curious about to whom he referred, if to anyone at all, I asked him who was not in, but he just repeated the same utterance emphasizing the fact that no one was in the room. Thus it is again clear that he was not referring to anyone in particular. More similar examples will be discussed later.

On the other hand, the example in (1b) was used when the child returned one of the turners for cooking to me because he only wanted one. Given the same context, an adult would use the following sentence with the verb preceding the numeral object and a more specific classifier for turners, i.e., *zhi*:[4]

(4)   Wo *bu yao liang zhi*.
      I not want two CL
      'I don't want two.'

---

[4] In the context that is clear, a head noun can be omitted. Therefore, instead of *yi zhi guo chan* 'one turner for cooking', one can say *yi zhi* 'one'. Note that by the age of 2;10, the child has no problem using a numeral NP with an overt head noun, e.g., *ren* and *xie*, as shown in the following examples:

(i)   *Liang ge ren* qilai le. (2;9)
     two CL person get:up PART
     'Two people got up.' (*Liang ge ren* was used to refer to his father and sister.)

(ii) *Yi zhi xie* bujian le. (2;10)
     one CL shoe disappear PART
     'One shoe has disappeared.'

Note that the child didn't use the sentence to mean that he didn't want any of them. It is clear that *liang ge* in the child's speech is quantity-denoting.

In adult speech, a numeral object can occur in a preverbal position if it is marked by the adverb *dou* 'all' (e.g., Lee 1986) or the auxiliary *you* 'have', giving rise to the definite interpretation and indefinite reading, respectively.

(5) a. Wo *liang zhi (*dou) bu* yao.
         I two CL all not want
         'I don't want the two.'
     b. Wo (**you) liang zhi bu* yao.
         I have two CL not want
         'There are two that I don't want.'

Crucially, the overt marking for both interpretations is indispensable in adult speech.

A numeral object can also occur before a verb if it is quantity-denoting and contrastively focused, as shown in the following example given in Tsai (1994):

(6) Wo *yi pian lunwen* keyi yingfu, *liang pian* jiu bu xing le. (Tsai 1994:138)
     I one CL paper can handle two CL then not able PART
     'I can handle one paper, but not two.'

Several questions can be raised with respect to the two types of examples in (1):

(7) 1. Why does the child place negation in the non-target position as in (1a)?
    2. What do data such as (1a) tell us about the child's understanding of scope?
    3. When does the child's scope become adult-like?
    4. What do the data in (1b) tell us about the child's understanding of the scope of negation?

The above questions will be answered by the discussion of the data in (1) and other spontaneous examples. The rest of the paper proceeds as follows. Section 2 reviews the scope rule for Chinese. This is followed

by the discussion of the previous findings in the acquisition of scope in Section 3. Our explanations of the data are given in Sections 4 and 5. Finally, Section 6 concludes the paper.

2. THE SCOPE RULE FOR CHINESE QUANTIFIERS

Generally speaking, two factors determine the scope of quantifiers: the inherent characteristics of the individual quantifiers, and their grammatical functions within a clause (e.g., Ioup 1976, Musolino (to appear), among others). For the first factor, consider the following examples in English.

(8)   a.   *Every dog doesn't* distrust Fred.
        b.   *Some people do not* like John.

The sentence in (8a) is ambiguous. On one reading, also the preferred reading, (8a) can be paraphrased as *Not every dog distrusts Fred*. In this case *every dog* is interpreted within the scope of negation (abbreviated *not > every*).

The example (8a) can also be paraphrased as *Every dog is such that it doesn't distrust Fred*. This is when the universally quantified subject is interpreted outside the scope of negation (*every > not*). The latter reading is called 'isomorphic' since in this case, the scope relation between *every dog* and negation can be directly read off their surface position. The former reading is 'non-isomorphic' because the surface position of *every dog* and negation does not coincide with their semantic interpretation.

When *some people* replaces *every dog* in (8a) as in (8b), the ambiguity disappears. The only reading available in (8b) is the wide scope reading of *some people,* an isomorphic interpretation which can be paraphrased as *There are some people who do not like John*. The availability of a non-isomorphic interpretation in (8a), but not in (8b), depends in part on the lexical nature of the quantificational elements involved. The former involves a universal quantifier, while the latter an existential quantifier.

The second factor that figures prominently in determining scope possibilities is the grammatical functions of quantifiers. Compare the example in (8a) with (9).

(9) I *didn't* talk to *every student*.

As discussed above, the universally quantified NP in (8a) occurs in the subject position and the sentence is perceived to be ambiguous. In (9), with the universally quantified NP occupying the object position, the most natural interpretation is the isomorphic one. That is, *every student* is interpreted within the scope of negation (*not > every*), meaning the speaker talked to some of the students but not to others.

   The first factor again exerts its influence when *every student* is replaced by *some student* in the object position:

(10) I *didn't* talk to *some students*.

Now, the most natural interpretation of (10) becomes the non-isomorphic one, which means *There are some students to whom I didn't talk* (*some > not*). Finally, a numeral NP in the same position yields both readings:

(11) I *didn't* talk to *two students*.

Negation in (11) takes a wide scope interpretation (*not > two*), i.e., an isomorphic interpretation, meaning that it is not the case that the speaker talked to two students (perhaps the speaker only talked to one student). Or, it can have a wide scope interpretation of the numeral NP (*two > not*), a non-isomorphic interpretation, meaning that there are two particular students to whom I didn't talk.

   In sum, the above data show that two factors, that is, the inherent characteristics of quantifiers and the grammatical functions of QNPs, are crucial in determining the scope possibilities in English. Note that Ioup (1976) further claims that apart from these two factors surface word order plays no role in scope assignments.

   Now let us turn to Chinese. Arguing against Ioup (1976), S. Huang (1981) maintains that the scope rule for Chinese QNPs can be stated in purely surface terms, quite independently of the two factors discussed above. S. Huang compares the following English and Chinese examples.

(12) a. I *didn't* solve *many of the problems*.
     b. *Many of the problems* I *didn't* solve.

(13) a. Wo *meiyou* jiejue *henduo wenti*.
       I not solve many problem
       'I didn't solve many problems.'
    b. *(You) xuduo/henduo wenti* wo *meiyou* jiejue.
       have many/many problem I not solve
       'There were many problems that I didn't solve.'

While the English example in (12a) is ambiguous, its Chinese counterpart in (13a) is not. In addition to the narrow scope interpretation of *many of the problems* with respect to negation, (12a) also allows a wide scope reading of *many of the problems*, which is paraphraseable as (12b). This is, however, not possible for Chinese. Unlike its English counterpart in (12a), *xuduo/henduo wenti* 'many problems' in (13a) cannot have scope over negation. *Xuduo/henduo wenti* has to precede negation at the surface structure with the optional *you* 'have' in order to obtain a wide scope interpretation as shown in (13b). Note that in (13a) the negative marker *meiyou* is used instead of *bu* because what is negated is an event.

    With such examples and many others that involve other types of QNPs, S. Huang concludes that the scope of QNPs can be computed from their surface structure.

    The fact that Chinese quantifiers are more restricted in scope possibilities compared to English is further confirmed by C.-T. Huang (1982).

(14) a. *Everyone* bought *a book*.
    b. *Someone* bought *every book*.

(15) a. *Mei ge ren* dou mai-le *yi ben shu*.
       every CL person all buy-ASP one CL book
       'Everyone bought a book.'
    b. *(You) yi ge ren* mai-le *mei yi ben shu*.
       have one CL person buy-ASP every one CL book
       'Someone bought every book.'

Based on the fact that the English examples in (14) are ambiguous, but the Chinese counterparts in (15) are not, C.-T. Huang proposes a general Isomorphic Principle (IP) for Chinese requiring that the relative scope order of QNPs correspond to their c-command relationship in overt

syntactic structure. In other words, if QNP1 c-commands QNP2, then QNP1 has scope over QNP2. Ambiguities in English are derived from restructuring (or vacuous rightward movement of quantifiers).

The scope possibilities are later explored in Aoun and Li (1989, 1993) and in many others.[5] Following May (1985), Aoun and Li (1993) assume that QNPs are raised at LF by the role of quantifier raising (QR), and adjoined to an A'-position such as V', VP, or IP, but not CP. Their scope principle is given as follows:

(16) Scope principle
      An operator A may have scope over an operator B iff A c-commands B or an A'- element coindexed with B.

For our purpose in this study, it is sufficient to show that the relevant structural relation and level of scope representation are c-command and LF, respectively, and an A'-trace may play a role in the sense of Aoun and Li.

3. THE ACQUISITION OF SCOPE

In the literature of acquisition, it has been reported that in interpreting scopally ambiguous sentences containing a QNP and negation, children tend to have a strong preference for the interpretation which corresponds to the surface structural position of the two elements (Musolino et al. 2000).

Using the Truth Value Judgment methodology (Crain and Thornton 1998), Musolino et al. tested the comprehension of sentences as follows.

---

[5] After Aoun and Li (1993), there are a series of works debating the issue. They include Kuno, Takami and Wu (1999), which challenge Aoun and Li (1993), and the follow-up studies—Aoun and Li's (2000) responses to Kuno, Takami and Wu (1999) and Kuno, Takami and Wu's (2001) responses to Aoun and Li (2000). Overall speaking, on the one hand, Kuno, Takami and Wu claim that the quantifier scope interpretations of a given sentence result from the interactions of various principles, some syntactic, others nonsyntactic. On the other hand, Aoun and Li maintain that a structural approach to scope should not be abandoned.

(17) a.   *Every horse didn't* jump over the fence.
          (*every > not*; *not > every*)
      b.   The detective *didn't* find *someone*.
          (*someone > not*)

A story used to test (17a) involved three horses trying to jump over a fence. Two of the horses jumped over the fence but the third one didn't. At the end of the story, the subjects were asked to judge whether the statement made by a puppet about the situation in (17a) was true or false. Note that the statement is TRUE for the non-isomorphic (i.e., 'not all') interpretation of the sentence since it is true that not all of the horses jumped over the fence. In contrast, the puppet's statement is FALSE for the isomorphic (i.e., 'none') interpretation since two horses did jump over the fence. A YES response to the puppet's statement that every horse didn't jump over the fence (along with appropriate justification) therefore indicates that subjects are accessing the 'not all' (non-isomorphic) interpretation, while a NO response (along with appropriate justification) shows that they are accessing the 'none' (isomorphic) interpretation.

The experiments find that English-speaking preschoolers tend to rely on the surface c-command relations between negation and QNPs. Both the 5-year-olds and 6-year-olds, unlike adults, systematically access the isomorphic reading of sentences like (17a). Similarly, both the 4-year-olds and 5-year-olds tested, unlike adults, systematically access the isomorphic reading of sentences like (17b). This is the so-called Observation of Isomorphism in Musolino et al. (2000:14).

A question raised by the findings in Musolino et al. is whether isomorphism results from the linear order of the quantificational elements involved or from the hierarchical structure of c-command. This question arises because in English the object follows and falls within the c-command domain of sentential negation, while the subject position precedes and falls outside of the c-command negation. Lidz and Musolino (2002) explore this issue by studying how children and adult speakers of English and Kannada (Dravidian, an SOV language) interpret scopally ambiguous sentences as follows:

(18)   Donald *didn't* find *two guys*.

It is found that while adults can easily access either scope interpretation, 4-year-olds display a strong preference for the isomorphic interpretation. Crucially, however, they show children's interpretations are constrained by the surface hierarchical relations (i.e., the c-command relations) between these elements and not by their linear order.

Employing the same kind of methodology, Su (2001) finds Chinese-speaking children do not seem to prefer the isomorphic interpretation when it comes to the interaction between negation and numeral objects that involve one. According to Su, the following Chinese example and its English counterpart are ambiguous.

(19) a.   Milaoshu *meiyou* qi *yi-zhi gou*.[6]
           Mickey:mouse not ride one-CL dog
      b.   Mickey mouse didn't ride a dog.

They can mean either that there exists a dog that Mickey Mouse didn't ride (*a > not*), or that Mickey Mouse didn't ride any dog (*not > a*). In her experiment, the sentences in (19) were presented both in a context in which Mickey Mouse didn't ride one of the three dogs but rather rode two of them, and in a context in which he didn't ride any of the dogs. The results show that Chinese-speaking children predominately accepted

---

[6] It should be pointed out that C.-T. Huang (1987) does not take a sentence to be grammatical that contains negation and a following *yi* 'one' NP:

(i)   *Wo *meiyou* kanjian *yi ge ren*. (C.-T. Huang's judgment)
         I not see one CL person
         'I didn't see a certain person.'

In contrast, Shi (1992: 117) accepts this kind of sentence with verbs such as *jian* 'build' but not *queqi* 'rise':

(ii)   a.   Shan qian *mei* jian *yi dong da lou*.
              mountain front not build one CL big building
              'No big building was built in front of the mountain.'
         b.   *Shan qian *mei* jueqi *yi dong da lou*.
              mountain front not rise one CL big building
              'No big building stands before the mountain.'

According to Shi, the verb in (iib) requires a fixed quantity and thus cannot be negated by *mei(you)*.

the former reading, i.e., the existential wide scope reading, but English-speaking children preferred the latter reading, i.e., the negation wide scope reading. This seemingly preference for a wide scope interpretation, as suggested in Su, is due to the fact that the young Chinese-speaking children took the *yi* 'one' NP in (19a) to mean 'exactly one' and accepted the test sentence in the context where Mickey Mouse didn't ride ONE of them and rejected it in the context where no dogs were ridden because it was THREE not one that Mickey Mouse didn't ride. Unlike the Chinese children, the young English-speaking children were able to take *a* to mean something similar to *any*, giving rise to the wide scope of negation, rather than take it to mean 'exactly one' because *a* and *one* are lexically distinguished in English.

A follow-up study in Su (to appear) has a similar finding for the interaction between negation and a numeral NP that involves *liang* 'two', i.e., while Chinese-speaking adults prefer the narrow scope reading of the numeral NP, Chinese-speaking children prefer the wide scope reading of the numeral NP. Two of the situations designed for the test are given below.

(20) a. Xiao nanhai *meiyou* qi *liang tou niu*.
          little boy not ride two CL cow
          'The little boy didn't ride two cows.'
      b. Xiao nuhai *meiyou* wei *liang-zhi mao*.
          little girl not feed two-CL cat
          'The little girl didn't feed two cats.'

In the story presented for the test of (20a), the little boy rode one of the two cows, but not both. This makes a narrow scope reading of the numeral NP true, but a wide scope reading of the numeral NP false. In the story corresponding to (20b), the little girl didn't feed two of the four cats, but she did feed the other two. This gives the opposite truth condition, i.e., the wide scope reading of the numeral NP is true, but the narrow scope reading of the numeral NP is false.

Two important differences emerge between Su's recent study and the study in Lidz and Musolino (2002) discussed above. First, while English- and Kannada-speaking adults can easily access either scope interpretation, Chinese-speaking adults have a strong preference for a narrow scope reading of numeral NPs. Second, unlike English- and Kannada-speaking children who prefer the narrow scope reading of

numeral NPs, Chinese-speaking children display a strong preference for the wide scope reading of numeral NPs.

Just as in Su (2001), Su (to appear) suggests that such discrepancy between Chinese-speaking children and English-speaking children may be due to the fact that the Chinese-speaking children took the numeral NP as denoting quantity and thus assigned it a scope-independent reading. A crucial question in this kind of study is how the children understand an object numeral NP. Is it possible that the children took a numeral object as a definite NP in some cases? For example, in the context where two cats were fed but two others weren't, the children may have focused on the two cats that weren't fed and thus accepted the seemingly wide scope reading of the test sentence.

Before we leave this section, let me mention the study in Lee (1991) for the sake of comparison with our study later. Though Lee's study focuses on the scope interaction of two QNPs, it clearly establishes that Chinese children distinguish quantifier scope at age 6. His scope principles, however, are different from those in C.-T Huang (1983) and Aoun and Li (1989, 1993), as illustrated below.

(21)   Suppose A and B are QNPs, then:
    a. If A asymmetrically commands B at S-structure, A has scope over B at Logical Form (LF). (A *commands* B if neither dominates the other and the first S node dominating A also dominates B).
    c. If A and B command each other and A precedes B at S-structure, A has scope over B at LF.

4. THE DEVELOPMENT OF NEGATION AND SCOPE

4.1 Placement of Negation

Now let us consider the first question raised in Section 1, repeated here:

(22) Why does the child place negation in the non-target position as in (1a)?

In the 1970s, it was found that three kinds of negation appear early in development: rejection, nonexistence and denial, as exemplified in (23) (Bloom 1970).

(23)   a. No! (used to refuse an offered piece of food)
       b. No juice. (used to comment on an empty bottle)
       c. No. (used to answer a question)

A fourth type of negation was added in Vaidyanathan (1991), where the four types were claimed to occur in the following order:

(24)   rejection > nonexistence > prohibition > denial

In the spontaneous speech collected in this study, a similar order is found.[7] But before we discuss such point further, it should be noted that the child is a bloomer in terms of the development of his language. He didn't produce an utterance that would accord with the definition of a sentence until he was 1;10:

(25)   Yaya bɔ bɔ . (1;10)
       duck swim
       'The duck swims.'

In this paper I focus on the use of his negative markers after his first sentence.

Rejection
(26)   Guozi *bu yao* (2;0)
       pot not want
       'I don't want the pot.'

Nonexistence
(27)   Zi *mei you*, *mei you* zi. (2;2)
       seed not have not have seed
       'No seed.'

---

[7] This is only intended to give a rough idea of how different functions of negation are developed in the child, as the focus of this paper is the position of negation, not the functions of negation. To better understand how different functions are developed, however, tokens should be counted. I will leave this for future research.

(28) *Meiyou* tangtang. (2;2)
      not hot
      'Not hot.'

Prohibition
(29) Mother: Keyi zai limian zhuzhu.
               can in inside cook
               'You can cook inside.'
      Child: Limian *bu yao* zhuzhu. (2;3)
               inside not want cook
               'Don't cook inside.'

Denial
(30) Mother: Gougou yaozou le.
               dog bite-away PART
               'A dog took it (the pacifier) away by biting on it.'
      Child: *Meiyou* gougou yaozou le. (2;3)
               not dog bite-away PART
               'No dog took it away by biting on it.'

The child's sentence in (30) involves an instance of sentence-initial negation. It was used to deny a previous utterance.[8] There are different analyses for such occurrence of negation in other languages. I will not go into the details of the different analyses (cf. Bellugi 1967, Bloom 1970, 1991, McNeill 1971, Drozd 1995, among others).[9] For our purpose here, it is sufficient to point out that this use of negation is quite distinct from the sentence-internal negation to be discussed below in terms of its position and function.

   As mentioned in Section 1, the child places negation in a non-target position. An example of this is given in (1a), repeated here with other similar examples.

(31) *You ren bu* zai. (2;11)
      have person not in
      'No one is in.'

---

[8] This is one of the four classes of denial defined by Geurts (1998).

[9] According to Bellugi (1967) and McNeill (1971), early negative sentences are formed by adding a negative element outside an affirmative nucleus or proposition.

(32)   a.   *You ren* bu hui cai-dao. (3;0) (cf. *Mei you ren* hui cai-dao.)
             have person not will step-arrive   not have person will step-arrive
             'No one will step on it.'
       b.   *You ren bu* bang wo nian. (3;1) (cf. *Mei you ren* bang wo nian.)
             have person not help I read   not have person help I read
             'No one read for me.'

(33)   You ren *zai bu zai*? (3;1) (cf. *You mei you* ren zai?)
       have person in not in   have not have person in
       'Is anyone in?'

Note that *you ren* in both examples of (32), just like that in (31), does not refer to any specific person. The child used (32a) as a response to my complaint that someone would step on the toys that he had left on the floor. I hadn't meant that there was a specific person that would step on the toys. More clearly, the example in (32b) was not used as a response. It was used to complain to me that no one would read for him. He didn't specifically mean someone hadn't read for him. Moreover, it is interesting to point out that in (33) the child forms an A-not-A question with the main predicate *zai* instead of using the auxiliary *you* 'have'.

   A question that one may raise is why the child places the negation in a lower position. A possible semantic explanation is that the child's non-adult concept of the possibility of the scope comes from a representation in which the child equals the quantification of an event to a quantification of individual objects.[10]

   This, however, is not a viable analysis because the placement of negation appears to be systematic and rule-governed, targeting not just a verbal head but also a nominal head. Consider the following examples.

---

[10] This is an idea similar to Philip's (1995) semantic explanation for the non-adult responses of children to sentences with QNPs. In a typical class-inclusion task (Inhelder and Piaget, 1958, 1964), subjects are asked whether all the circles in an array composed of blue squares and blue circles. While adults answer affirmatively (all the circles are indeed blue!), children as old as 7 or 8 often answer negatively. When asked to justify their answers, they point to the fact that there are also blue squares in the array. Philip (1995) argues that children's non-adult interpretation of sentences containing a universal quantifier corresponds to a linguistic representation in which the child overgeneralizes a tendency to quantify over individual events rather than individual objects.

(34) Mother: Zhunbei hao le mei?
     prepare fine PART PART
     'Are you ready?"
  Child: [Zhunbei hai *mei* hao]. (cf. Hai *mei* zhunbei hao.) (2;11)
     prepare yet not fine yet not prepare fine
     'I'm not ready yet.'

(35) Mother: Mommy pa ni hui tiedao.
     Mommy fear you will fall
     'I'm afraid that you will fall.'
  Child: Wo pa *bu* hui tiedao. (3;0) (cf. Wo *bu* hui tiedao/wo bu pa.)
     I fear not will fall   I not will fall/I not fear
     'I'm afraid that I won't fall.'

(36) Mother: Wo pa ni hui tu a!
     I fear you will vomit PART
     'I'm afraid that you will throw up.'
  Child: Wo pa bu hui tu. (3;0) (cf. Wo *bu* hui tu/wo bu pa.)
     I fear not will vomit I not will vomit I not fear
     'I'm afraid that I won't throw up.'

(37) Mother: Wo ba ta [he-*bu*-wan]. (3;1) (cf. Wo *meiyou* ba ta he-wan.)
     I BA it drink-not-finish I not BA it drink-finish
     'I hadn't finished drinking it.'

(38) [Jia *bu shi* da] de. (3;1) (cf. Ni *bu shi* jia da de.)
  fake not be hit DE you not be fake hit DE
  'You're not faking it in hitting me.' ('You really hit me hard.')

(39) Liang zhi *mei you* shou. (3;1) (cf. *Mei you* liang zhi shou.)
  two CL not have hand   not have two CL hand
  'No two hands.'

  What is being negated in (39) is a nominal head, unlike the verbal heads in the previous examples. Another important observation about the above data is that different negative forms are used. In fact, they are the target forms *mei*, *bu*, and *bu shi*. As we mentioned earlier, *mei(you)* negates an event and *bu* a state. The combination *bu shi*, on the other hand, negates a focused element with *shi* as a focus marker. The only

problem with this combination is that they are placed in a non-target position. For example, *bu shi* in (38) negates the focused adverb *jia* and should precede it in adult speech, but the child places it a position immediately preceding the main predicate *da* 'hit'. The example in (37) is interesting because the target form for negating the resultative state is *bu*, but given the fact that the object maker *ba* is present, the negative marker should be *mei(you)* and should be placed in a position higher than *ba* in adult speech to be relevant.

Based on the data, what seems to the relevant is the notion of head and it is the lowest head that counts: be it the resultative complement of a compound as in (34) and (37), the main predicate in (38), the predicate of the lower clause as in (35) and (36), or the head noun as in (39).

A simple rule for the above data can be given as follows:

(40)   Placement of Negation
       Place negation in a position immediately preceding the lowest head available.

4.2 Scope Sensitivity

The placement of negation in a position only immediately preceding the lowest head available causes the problem of scope with respect to an indefinite subject. This brings us to the second question raised in Section 1:

(41) What do data such as (1a) tell us about the child's understanding of scope?

Before we answer this question, it should be pointed out that in a preverbal position an indefinite NP is not c-commanded by the negative marker that occurs after it. This can be clearly seen from the licensing of a negative polarity item.

(42)   a.   *Mei you shenme ren* xihuan zhe yang de yinyue.
             not have what person like this kind DE music
             'No one likes this kind of music.'
        b.   *(You) *shenme ren bu* xihuan zhe yang de yinyue.
             have what person not like this kind DE music

As a negative polarity item, the *wh*-phrase in the above sentences has to be licensed by a c-commanding negative marker, as in (42a). The licensing is not possible when the negation follows the negative polarity item, as in (42b).

Then, the question arises as to what data such as (1a) can tell us about scope. There are two possibilities—The child is either too good at it or too poor at it. The child may have perfect LF representations where negation c-commands the QNP by raising to some higher position or c-commands a trace of it.[11] Or, it may be the case that the child is insensitive to scope at this stage.

Here I would like to suggest that the child at this age is insensitive to scope rather than too good at it. A crucial argument supporting this is that cross-linguistic data show that the scope possibilities allowed by young children are quite restricted. As we mentioned above, while Su's studies (2001, to appear) are not conclusive, the study in Musolino et al. (2000) shows that even in a language that allows scope ambiguities such as English, children will take the isomorphism interpretation as the default value. It is then safe to argue that children will start at a stage where isomorphism is the norm and later allow the non-isomorphic interpretation, rather than claim that the child either starts with ambiguity or a non-isomorphic interpretation. This would then mean that the child is not sensitive to scope.[12,13]

---

[11] This is different from Aoun and Li (1989, 1993), where it is argued that what is relevant for scope is an A'-trace. Moreover, for Aoun and Li, Chinese does not allow subject raising.

[12] The dispute between c-command and isomorphism becomes a non-issue in the sense of Kayne (1994), where it is argued that the relation between hierarchical and linear order is rigidly fixed with linear order corresponding to asymmetric c-command relations (the Linear Correspondence Axiom).

[13] This does not mean that the child would always take negation marked at the post-subject position to have scope over an indefinite subject. Consider the following from an early age.

(i)   Yi ge ren bu guai. (2;10)
        one CL person not good
        'Someone/one does not behave himself.'

The child uttered (i) when one of his two cousins did not help to put away the toys that they had been playing with. In this case, *yi ge ren* may refer to a specific person or may

If it is indeed the case that the child at the age of 2 is not sensitive to scope, this would bring us to the third question:

(43)　When does the child's scope become adult-like?

As for the answer to this question, the following example shows that this may start at the age of 3;2 when two instances of negation are found as follows:

(44)　*Mei you* ren bi ta *bu* yiyang. (3;2) (cf. *Mei you* ren gen ta yiyang.)
　　　　not have person compare he not same not have person with he same
　　　　　'No one is the same with it.'

This sentence was used when the child pointed out that one of the buttons on a picture was different from others in terms of colors. The double negations in the above example do not cancel each other out. What the child intended was the negation of the indefinite subject. This doubling can be taken to be a crucial piece of evidence that the child starts to make sense of scope and places the negative marker in the target scope position, but somehow still hasn't dropped the negation in the lower position.

After the appearance of examples like (44), the child shows no sign of producing non-adult sentences like (1a). A sentence with negation clearly having scope over the indefinite NP that involves *ji* 'several' is found at 4;4.

(45)　Shenpo jia *mei you ji jia dian* zai pangbian. (4;4)
　　　　Great:Auntie home not have several store in side
　　　　　'Great Auntie's home does not have several stores by its side.'

(45) was uttered when the child was looking at a picture with a bridge. The child took the bridge to be a crossover for trains. I asked him whether he thought that that was the crossover by his Great Auntie's house. In this example, negation clearly has scope over the numeral NP.

---

be simply quantity-denoting. Negation either has narrow scope with respect to the indefinite subject or does not interact with it.

5. SCOPE MARKING AND NEGATION

5.1 Lack of Contrastive Focus

As we mentioned above, after the stage of double negation, the child is able to mark the scope of negation correctly when a quantified subject is involved. What happens in the case where a numeral object occurs in the preverbal position in (1b) and what is the answer to the fourth question raised in Section 1? They are repeated as follows.

(46) *Liang ge bu* yao. (2;10)
       two CL not want
       'I don't want two.'

(47) What do the data in (1b) tell us about the child's understanding of the scope of negation?

Similar examples to (46) are found later and even as late as 4;3:

(48) Bu shi liang ge, *liang ge mei you*. (3;1) (cf....*mei you liang ge*.)
       not be two CL   two CL not have   not have two CL
       'This is not two. I don't have two.'

(49) Mother: Laoshi shuo ye keyi dai liang ge a!
                 Teacher say also may bring two CL PART
                 'Teacher said you can bring two.'
       Child: Wo mei ting-dao Laoshi shuo *liang ge* keyi dai. (3;8)
                 I not hear-arrive teacher say two CL may bring
                 'I didn't hear Teacher say that we can bring two.'
                 (cf....keyi dai *liang ge*.)
                     may bring two CL

(50) Mother: Ni yi ge zi ye bu rende o. (4;3)
                you one CL character also not know PART
                'You don't know a single character, right?'
      Child: Wo *yi ge zi* rende a!
                I one CL character know PART
                'I do know one character.'
                (cf. Wo rende *yi ge zi* a!/Wo *you yi ge zi* rende a!)
                I know one CL character PART I have one CL character
                know PART
                'I do know one character/I know a character.'
      Mother: Ni rende shenme zi?
                you know what character
                'What character do you know?'
      Child: Wo rende 'yi' a!
                I know 'one' PART
                'I know 'one'.'

Let us examine the above three examples one by one. The example in
(48) was uttered when the child wanted to have two cookies and was
telling me that he had not gotten two. Just like the example in (46), what
is involved in the numeral object is quantity. In the situation for (49), the
child couldn't decide which one of two toys to bring to school for his toy
sharing day. To save time, I just made-up a story by telling him that the
teacher had said that two toys could be allowed. But the child challenged
what I said by saying that he had never heard the teacher say so. It is
clear that in this context, *liang ge* is meant to be quantity-denoting. As
for the situation for (50), I was making fun of the child by saying that he
didn't even know a single character. The child refuted what I said by
using the non-target form *wo yi ge zi rende a*. The use of *yi ge zi* may be
either quantity-denoting or specific. In this subsection, I will focus on the
quantity-denoting interpretation. The definite/indefinite interpretation
will be discussed in the next subsection.

Recall from the discussion in Section 1 that for a quantity
interpretation, a contrast is necessary for adult speakers. The relevant
example is repeated below.

(51) Wo *yi pian lunwen* keyi yingfu, *liang pian* jiu bu xing le (Tsai 1994:138)
     I one CL paper can handle   two CL then not able PART
     'I can handle one paper, but not two.'

A point not mentioned above, however, is that the modal context is another crucial factor for the licensing of the quantity interpretation.

(52) a. Ni *liang ge* bu yao, *san ge* ye bu yao, ni yao ji ge?
        you two CL not want three CL also not want you want how:many CL
        'You don't want two. Neither do you want three. How many do you want?'
  b. Ta *liang ge* bu yao, zhi yao *yi ge*.
       he two CL not want only want one CL
       'He doesn't want two. He only wants one.'

But note that the quantity interpretation is independent from negation as evidenced in Tsai's example and does not require the continuous conjunct to be negative or not as shown in (52).

Given the fact that the interpretation that the numeral object has is a quantity one, no scope is involved. The non-target data in (46) and (49)-(50), however, show that by 4;3 the numeral object in the child's speech is not contrastive focus oriented in the sense of having an overt contrastive part. On the other hand, (48) may be taken to involve contrastive focus, but it is non-target because no modal context is present. Similarly, (50) does not involve a modal context. The following example appearing at 4;5, however, shows that by this age the child is able to place the numeral object that refers to quantity back to the postverbal object position when no modal context is involved.

(53) Laoshi shuo bu yao dai *liang ge*, yi ge jiu keyi le. (4;5)
     Teacher say not need bring two CL one CL then may PART
     'Teacher said we don't need to bring two (pictures). One is enough.'

5.2 Overt Scope Marking

The licensing of the occurrence of a numeral object that occurs preverbally is more complicated than what we had just discussed in the previous section. As mentioned in Section 1, in addition to the quantity interpretation, a preverbal numeral NP can be marked as a definite one by the use of *dou* 'all', or as an indefinite one by *you* 'have':

(54) a.   Wo *liang zhi dou bu* yao.
           I two CL all not want
           'I don't want the two turners.'
     b.   Wo *you liang zhi bu* yao.
           I have two CL not want
           'There are two that I don't want.'

     The use of *dou* or *you* is also independent of negation, as shown by the following examples:

(55) a.   Wo *liang zhi* *(*dou*) hen xihuan.
           I two CL all very like
           'I like both of them very much.'
     b.   Wo *(*you*) *liang zhi* hen xihuan.
           I have two CL very like
           'I like two of them very much.'

On the other hand, the use of *dou* or *you* clearly marks scope unambiguously. In other words, *dou* or *you* should have scope over negation.[14] I will thus call them scope markers.

     A crucial difference between the child's early speech and an adult's is that marking is not always there when a numeral NP is either definite

---

[14] The case with an indefinite NP with *shenme* 'what', however, is less obvious because (ia) is logically equivalent with (ib).

(i)   a.   Ta shenme dongxi dou meiyou chi.
            he what thing all not eat
            'He didn't eat anything.'
      b.   Ta meiyou chi shenme dongxi.
            he not eat what thing
            'He didn't eat anything.'

Negation in (ia) may be argued to take wide scope with respect to the indefinite object, which is interpreted existentially when occurring in the scope of NEG (*not > any* = ~∃). Or, it may be argued to take narrow scope, which is then interpreted universally (*all > not* = ∀~).

     But noticeably, (ib) has an interpretation which is not available in (ia). That is, it can mean 'he didn't eat anything special'. Given this, it might be more plausible to argue that the negative marker does not have scope over *shenme dongxi* when it is marked by *dou* 'all'. Or, more precisely, *dou* takes scope over negation.

or indefinite. Recall that we have just seen in the case of (50) that a specific interpretation may be intended with no overt marking. Now consider more examples.

(56) Mother: Agong, Ama ni xihuan na yi ge?
               Grandpa Grandma you like which one CL
               'Who do you like better, Grandpa or Grandma?'
       Child: *Liang ge* yao. (2;11) (cf. *Liang ge dou* yao.)
               two CL want   two CL all want
               'I want both.'

(57) *Liang ge* yao dai hui jia. (3;0) (cf. *Liang ge dou* yao dai hui jia.)
       two CL want bring return home   two CL all want bring return home
       'I want to bring the two home.'

   In (56) and (57), *dou* is missing. But this does not mean that the child does not use *dou* at all at an early age. Consider the following examples.

(58) *Liang ge dou* zou le. (2;11)
       two CL all leave PART
       'Both are gone.'

The example in (58) is different from (56) and (57) because it involves a numeral subject. The child uttered (58) when trains on both of the tracks in a Mass Rapid Transit station left the station at around the same time.
   For the sake of comparison, let us consider the use of *dou* in the examples where it occurs with universally quantified NPs and *wh*-phrases for a universal reading:

(59) *Mei ge ren dou bu* keyi chuan xie, *mei yi ge ren dou meiyou* chuan xie. (3;3)
      every CL person all not may wear shoe every CL person all not wear shoe
      'No one may wear shoes. No one wore shoes.'

(60) Sister: Daddy dai ni qu shenme difang?
                Daddy take you what place
                'Where did Daddy take you?'
      Child: *Shenme difang dou* mei you ba! (4;0)
                what place all not have PART
                'Nowhere!'

(61) Wo *zenmeyang dou bu* yao, *xizao dou bu* yao. (4;0)
      I   how   all   not want bath all not want
      'I don't want (it) in any way. No bath at all.'

(62) Wo mei jian-dao shou, wo *mei yi ge shou meiyou* jian-dao. (4;1)
      I not cut-arrive hand I not one CL hand not cut-arrive
      'I didn't cut my hands. None of my hands were cut.'
      cf.
      (…wo *mei yi gen shouzhi dou* meiyou jian-dao.)
      I not one CL finger all not cut-arrive
      'None of my fingers were cut.'

(63) *Shenme difang dou meiyou* zhao-dao….Wo zai *mei yi ge difang dou*
      what place all not find-arrive I in every one CL place all
      zhao-bu-dao. Wo zhao *mei ge difang dou meiyou* zhao-dao. (4;2)
      find-not-arrive I find every CL place all not find-arrive
      'I couldn't find it anywhere…I couldn't find it everywhere. I
      didn't find it everywhere.'

In all of the examples in (59)-(63), it seems to be the case that the child
has mastered *dou* marking for a universally quantified NP or *wh*-phrase
by 4;2. As far as the *you* marking is concerned, the use of *you* is seen at
4;3 as given in (82), which is to be discussed below. It is then safe to
claim that the child has mastered overt scope marking at 4;3.

   The conspicuous lack of a marker in the child's speech at an early
age may be correlated with the possibility that the child takes a preverbal
numeral NP to be definite as seen from the occurrence of such an NP in a
topic position:

(64) *Yi tiao yu* zhen haochi, *yi tiao yu* wo zui xihuan chi. (3;7)
        one CL fish really delicious one CL fish I most like eat
        'I like to eat the fish. I like fish the best.'
        (cf. *Zhe tiao yu/yu* zhen haochi, *yu* wo zui xihuan chi.)
          this CL fish fish really delicious fish I most like eat

While the first instance of the numeral *yi tiao yu* occurs in the subject position of a stative verb, its second occurrence clearly occupies the topic position. For either position, an adult speaker will either use an NP with a demonstrative such as *zhe tiao yu* 'this fish' or simply a bare NP *yu* referring to the type, rather than using a numeral NP.

   Note that the question of scope does not arise if the child takes the numeral NP to be definite. There will be no interaction between the numeral NP and negation if the former is interpreted to be definite.

   Now consider the following data that occur later.

(65) Zhao-bu-dao *liang ge*, zhao-bu-dao *na liang ge*. (4;4)
        find-not-arrive two CL find-not-arrive that two CL
        'I cannot find the two; I cannot find the two.'

(66) Child: Wo zhao-dao *yi zhang* le. (4;5)
                    I find-ASP one CL PART
                    'I found the one with the bridge.'
        Mother: Ni zhao-dao shenme?
                    you find-arrive what
                    'What did you find?'
        Child: Wo zhao-dao zhe zhang qiao de.
                    I find-arrive this CL bridge DE
                    'I found the one with the bridge on.'

   The child used (65) to tell me that he couldn't find the two missing tracks for his trains. Note that in adult speech a numeral object in the postverbal position can never be definite.[15] Interestingly, the child

---

[15] A numeral object can be definite only when it is marked by *dou* in a preverbal position. A numeral subject can be definite only when it anaphorically refers to a reference mentioned in the context, as shown in the following example taken from Chen (2004).

corrected himself right after his first sentence, showing that he was aware that a numeral object cannot be definite. In the case of (66), the conversation took place when the child was looking for a page of the manual that had instructions on how to make bridges. He knew of the existence of such a page and meant to look for that page. The two examples in (65) and (66) show that at about 4;4 the child starts to place the numeral object that is definite back to the postverbal position. Though for an adult speaker overt marking of definiteness is still required even in a postverbal position, this at least shows that numeral objects are no longer placed in a preverbal position without marking.

Before we leave this subsection, an example that is worth mentioning is the use of a numeral NP that involves *yi* 'one':

(67)   *Yi zhi dou mei* xi. (3;7) (cf. *You yi zhi dou mei* xi.)
        one CL all not wash   have one CL all not wash
        'One hand was not washed.'

For an adult, without knowing the reference of *yi zhi*, the most natural interpretation will take a numeral NP as denoting the lowest quantity. The '*all > not*' interpretation will be understood as meaning none of the hands were washed. If a specific hand is intended, it has to be first introduced by *you* 'have' to be salient in the context, giving rise to the meaning 'all of the hand was not washed', instead of 'none of the hands were washed'. When the child produced (67) at the age of 3;7, it is clear that the child had yet to distinguish different possible interpretations of a numeral object.

5.3 Mastery of Scope

So far we have seen that it takes a while for the child to place a numeral object back to the postverbal position. Strikingly similar examples are found with the use of duration phrases.

(i)   Zhangfu zhao-lai-le ji wei niwagong. *Ji wei niwagong* yong-le yi tian
       husband find-come-ASP several CL tiler several CL tiler use-ASP one day
       shijian ba fangding xiu-hao le. (Chen 2004:1171-1172)
       time BA roof fix-fine PART
       'The husband hired several tilers. The tilers took a day to fix the roof.'

Let us begin with the use of a duration phrase in adult grammar. In adult Chinese, the preposing of the duration phrase makes it possible to escape the scope of negation. For example,

(68) a. Ta *hen jiu mei* shui jiao le.
          he very long not sleep sleep PART
          'It has been a long time since he slept.'
      b. Ta *mei* shui *hen jiu* de jiao.[16]
          he not sleep very long DE sleep
          'He hasn't slept for a long time.'

The duration phrase *hen jiu* has scope over negation in (68a), but not in (68b). The only interpretation that (68a) has is that it has been a long time since he slept. In contrast, (68b) takes the wide scope of negation, which means that it is not the case that he slept for a long time (perhaps he slept for a short time).

There are several differences between a duration phrase and a numeral object. First, unlike a numeral object, no contrastive focus is required for a duration phrase to occur in a preverbal position. Second, unlike a numeral object, the occurrence of a duration phrase in the preverbal position depends on negation (cf. Li 1987). When negation is not present, a duration phrase cannot occur in the preverbal position:

(69) *Ta *hen jiu* shui jiao le.
       he very long sleep sleep PART

Third, while *dou* or *you* marking is required for a numeral object with no contrastive focus, it is optional for a duration phrase.

---

[16] The duration phrase *hen jiu* is a modifier for the noun due to the constraint of Chinese that only complements of a verb can occur in the postverbal position. (cf. C.-T. Huang 1982).

(70) a. Ta *hen jiu (dou) mei* shui jiao le.
　　　 he very long all not sleep sleep PART
　　　 'It has been a long time since he slept.'
　　 b. Ta *(you) hen chang yi duan shijian mei* shui jiao le.[17]
　　　 he have very long one CL time not sleep sleep PART
　　　 'It has been a long time since he slept.'

The optional *you* is reminiscent of the optional *you* that we have seen earlier in S. Huang's (1981) example in (13b), repeated here:

(71) *(You) xuduo/henduo* wenti wo *meiyou* jiejue.
　　　 have many/many problem I not solve
　　　 'I have many problems that I haven't solved yet.'

Note that though *xuduo/henduo wenti* is placed in the sentence-initial position, it can also be placed between the subject and the negative marker, optionally marked by *you* 'have' or *dou* 'all':

(72) Wo *(you) xuduo/henduo* wenti *(dou) hai* meiyou jiejue.
　　　 I have many/many problem all yet not solve
　　　 'There were many problems that I didn't solve.'

In either case, the QNP has scope over negation with or without the overt marking, just like a duration phrase. The use of *hai* 'yet' in (72) indicates that the problems were yet to be solved.

　　 Despite this, unlike a duration phrase but like other numeral objects, an NP quantified by *xuduo/henduo* 'many' occurring in the preverbal position does not have to be dependent on negation:

(73) Wo *(you) xuduo/henduo* wenti *(dou)* xuyao jiejue.
　　　 I have many/many problem all need solve
　　　 'There are many problems that I need to solve.'

Based on the scope possibilities and different interpretations, I would like to suggest that a quantity-denoting numeral object that is

---

[17] In this example, *hen chang yi duan shijian* 'a long period of time' is used instead of *hen jiu* 'a long time' because *hen jiu* only either occurs with *dou* or without *dou* as seen in the examples in the text.

contrastively focused occurs in a lower position compared to a duration phrase and a numeral object that is quantified by *dou* or *you*.[18]

Now consider the child's data. While no non-target forms related to an NP quantified by *xuduo/henduo* 'many' and negation are detected in the child's speech, quite a few non-target sentences with duration phrases are found. Consider the following examples.

(74) Women *hen jiu meiyou* paipai le. (3;6)
we very long not film PART
'We haven't been filming for a long time.'

(75) Wo *hao jiu* jiang zhe ge. (3;8) (cf. Wo yijing gen ni jiang *hao jiu* le.)
I quite long tell this CL   I already with you tell quite long PART
'I have been telling you about this for a long time.'

(76) Wo shui hen jiu le, qian ji tian shui dao *ban tian*. (3;9)
I sleep very long PART before several day sleep to half day
'I slept for a long time. I slept for half a day several days ago.'

(77) Ta yao *hen jiu* qu cai hui hui lai. (3;9)
she will very long go then will return back
'She will be gone for a long time before she comes back.'
(cf. Ta hui qu *hen jiu* cai hui hui lai.)
she will go very long then will return back

---

[18] This is only meant to be a tentative suggestion. Note that as pointed out in Paul (2002), the contrastive function is not restricted to numeral NPs. For example, a bare NP can also be contrastively focused:

(i)   Wo *cai* chi le, *fan* hai mei chi.
I vegetable eat PART rice yet not eat
'I have already eaten the vegetables, but not the rice.' (Zhu and Fan 1999:113)

In the literature, many studies treat a preposed object with or without overt marking such as *lian…dou/ye* 'even…all/also' as a focus (e.g., Ernst and Wang 1995, Shyu 1995, and Tsai 2000, among others). Paul (2002), however, takes the preposed object without marking to be an internal topic which sits in a position that is not adjoined to *v*P, but in the specifier position of a functional projection FP below the subject and above *v*P. I suggest that different types of NPs should be distinguished. Perhaps only the quantity-denoting numeral object occurs in a position adjoined to *v*P, in contrast to other NPs that occur in a higher position. Of course, more research on the structure will be necessary.

(78) Wo *yixia* yong zhe ge da-bu-dao. (4;0)
      I a:little:while use this CL hit-not-arrive
      'I used this for just a while (but) I couldn't hit it (referring to a moth).'

(79) Mother: Weishenme meiyou ba watuji dai huilai?
               why   not BA excavator bring back
               'Why didn't you bring the excavator back?'
      Child: Yinwei wo *tai jiu* fang nabian, wo meiyou kandao. (4;1)
               because I too long put there I not see
               'I put it over there some time ago, so I didn't notice it later.'
               (cf .…wo fang nabian fang-le *hen jiu*…)
                    I put there put-ASP very long

The above examples show that the child places a duration phrase in a preverbal position independent of negation at an earlier age, as shown in (75), and (77)-(79), though he is correct in (74) and (76).

Recall from our discussion above that starting from the age of 4;2, the child is able to recognize that *dou* marking is required for numeral NPs and other quantified NPs and *wh*-phrases that occur as objects in preverbal positions. The examples with duration phrases show that by 4;3 the child has mastered not only the *dou* marking, but also the *you* marking. Consider the following examples.

(80) Wo *ji tian dou* zuo feiji qu Disney, wo *ji tian dou zai* zuo feiji. (4;3)
      I several day all take airplane go Disney I several day all in take airplane
      'I had taken the airplane to Disney for the past few days. I had been
       taking the airplane to Disney for the past few days.'

(81) *Hao jiu kai che chu qu wan dou meiyou* jingguo zheli. (4;3)
      quite long drive car go out play all not pass here
      'It has been a long time since we passed here while driving out.'

(82) Wo *you ji tian* ting-bu-dong beiren zai shuo shenme, ji tian le. (4;3)
      I have several day hear-not-understand others in say what several day PART
      'For a few days I couldn't understand what people were saying.
       Several days already.'

(83) Wo *hen jiu dou* gen Mami zuo le. (4;3)
     I very long all with Mommy sit PART
     'I have been always sitting with Mommy (on a bus).'

(84) Wangji le, *hen jiu mei* qu le. (4;4)
     forget PART very long not go PART
     'Don't remember. I haven't been there for a long time.'

(85) Wo *hao jiu dou meiyou* wan-guo zhe ge wanju le. (4;5)
     I quite long all not play-ASP this CL toy PART
     'I haven't played with this kind of toy for quite a while.'

(86) Zhe ge *hen jiu meiyou* si xialai le. (4;5) (cf. …*hen jiu hai meiyou* si xialai.)
     this CL very long not tear down PART   very long yet not tear down
     'This hasn't been torn off for a long time.'

(87) Child: Pei wo yidiandian shuijiao. (4;5)
              accompany I a:little sleep
              'Sleep with me for a little while.'
     Mother: 'Pei wo yidiandian shuijiao' shi shenme yisi?
              accompany I a:little sleep be what meaning
              'What do you mean by 'Sleep with me for a little while'?'
     Child: Ni xian qu xizao. Xizao wan le, pei wo shui *hen jiu*,
              you first go bathe bathe finish PART accompany sleep very long
              zaoshang cai qilai. (4;5)
              morning   then get:up
              'You go to take a bath first. Then sleep with me for a long
              time. Then get up in the morning.'

     In all the examples in (80)-(87), the preverbal duration phrase has
overt marking or is present with negation. On the other hand, a duration
phrase with no negation occurs in the postverbal position, as shown in
(87). This means that by the age of 4;5 the child is able to correlate the
position of a duration phrase with respect to the presence of negation.
Some of the situations for the use of these sentences are given as follows.
(81) was used when the child was in the car and was telling me that we
hadn't taken a special route for a long time. The child used (83) when we
had just got on the bus. He gave me the reason why he wanted to sit with
his sister when I complained to him about the fact that he didn't want to

sit with me. The child used (85) to mean that he had played with that kind of toy before but that he hadn't played with it for a long time. This sentence sounds a little bit odd because of the use of the classifier *ge*, which would be replaced by *zhong* 'kind' in adult speech. Except for that, there is nothing wrong with (85). On the other hand, the child used (86) to mean that a sticker on a new alarm clock had been there for a long time and had yet to have been torn off. For the reason that the action has yet to happen, rather than be repeated, *hai* is required in adult speech. This shows that the child is yet to understand the difference between the two. Other than this, it is clear from the above examples that the child is able to place the duration phrase in the preverbal position for it to escape the scope of negation when negation is present, and place it in the postverbal position when negation is not present.

Finally, the example in (88) is interesting because although negation is missing, it is still implied as this is clear from the context.

(88) Child: …*tai jiu* chi dongxi, jiu hui si-diao. (4;5)
            too long eat thing then will die-arrive
            '(If) it has (not) eaten for too long a time, it will die.'
     Mother: 'Tai jiu chi dongxi' shi shenme yisi?
            too long eat thing be what meaning
            'What do you mean by 'having eaten too long'?
     Child: *Tai jiu* chi dongxi, ta jiu hui juede hen e. (4;5)
            too long eat thing he then will feel very hungry
            '(If) he has (not) eaten for too long a time, it will die.'

This explains why *tai jiu* is placed in the preverbal position. Finally, it should be pointed out that after 4;5 no non-target word order with respect to the placement of duration phrases is found.

5.4 Summary

Major findings in this section can be summarized as follows and in the following table:

(89) 1. From age 2;10, the child places the numeral object that is quantity-denoting in the preverbal position without contrastive focus.
   2. From age 2;11, the child places the numeral object that is definite/indefinite in the preverbal position without either *dou* or *you* for marking the scope.
   3. From age 2;11, the child places the negative markers *bu*, *mei*, and *bu shi* in a position immediately preceding the lowest head available.
   4. At the age of 3;2, the child is able to place the negative marker in a position preceding (or c-commanding) a quantified subject, which is evidence that the child is sensitive to scope.
   5. Starting from the age of 4;3, the child is able to recognize that either *dou* or *you* marking is required for numeral NPs and other quantified NPs and *wh*-phrases that occur as objects in the preverbal position.
   6. By the age of 4;5, the child has finally placed the duration phrases in target positions in relation to negation.

Table 1: The Findings of This Study

	2;10	2;11	3;2	4;3	4;5
1. Placing a numeral object that is quantity-denoting in the preverbal position --Adult: Scope-independent/contrastive focus oriented --Child: Scope-independent/not contrastive focus oriented	v				
2. Placing a numeral object that is definite/indefinite in the preverbal position --Adult: Scope-dependent/a scope marker required --Child: Scope-independent/lack of a scope marker		v			
3. Non-adult placement of negation		v			
4. Correct placement of negation			v		
5. Recognizing that a scope marker is required				v	
6. Placing a duration phrase in the target position with respect to its relation with negation					v

6. CONCLUSIONS

The child's non-adult scope is evidenced from his placement of negation immediately preceding the lowest head before 3 years old. At the age of 3;2, he eventually places the negative marker in a preceding (or c-commanding) position to mark wide scope over a quantified subject, conforming to adult speech. Further evidence shows that the child has mastered scope of negation and scope in general at the age of 4. First, starting from age 4;3, the child has managed to mark universal quantifiers and *wh*-phrases as well as duration phrases occurring in the

preverbal position with scope markers such as *dou* 'all' and *you* 'have' for definite/indefinite interpretations, although he has yet to acquire contrastive focus for the licensing of the quantity interpretation (a scope-independent interpretation). Second, by the age of 4;5, the child has managed to correctly relate the placement of a duration phrase with respect to negation, showing that he has mastered scope of negation.

The findings that the child is sensitive to scope around the age of 3;2 and has mastered scope by 4;5 are at variance with those in studies such as Lee (1991), where it is reported that Chinese-speaking children are not sensitive to quantifier order until the age of 6. A possible explanation for the discrepancy between the results in Lee's study and ours is that Lee focuses on the relative scope of two quantified NPs. Factors other than structure may play a role in determining scope ambiguities. However, the evidence put forth in this study shows that children may acquire the structure (/linear order) requirement, in as far as it is required for licensing quantifiers, at a much younger age.

REFERENCES

Aoun, Joseph and Yen-hui Audrey Li. 1989. Scope and constituency. *Linguistic Inquiry* 20.2:141-172.

Aoun, Joseph and Yen-hui Audrey Li. 1993. *Syntax of Scope*. Cambridge: MIT Press.

Aoun, Joseph and Yen-hui Audrey Li. 2000. Scope, structure, and expert systems: a reply to Kuno et al. *Language* 76.1:133-155.

Bellugi, U. 1967. *The Acquisition of the System of Negation in Children's Speech*. Cambridge: Harvard University dissertation.

Bloom, L. 1970. *Language Development: Form and Function in Emerging Grammars*. Cambridge: MIT Press.

Bloom, L. 1991. *Language Development from Two to Three*. Cambridge: Cambridge University Press.

Brooks, Patricia J. and Martin D. S. Braine. 1996. What do children know about the universal quantifiers *All* and *Each*? *Cognition* 60:235-268.

Chen, Ping. 2004. Identifiability and definiteness in Chinese. *Linguistics* 42.6:1129-84.

Cheng, L.-S. L. 1997. *On the Typology of Wh-Questions*. New York and London: Garland Publishing.

Crain, S. and R. Thornton. 1998. *Investigations in Universal Grammar: A Guide to Research on the Acquisition of Syntax and Semantics*. Cambidge: MIT Press.

Diesing, M. 1992. *Indefinites*. Cambridge: MIT Press.

Drozd, K. F. 1995. Child English pre-sentential negation as metalinguistic exclamatory sentence negation. *Journal of Child Language* 22:583-610.

Ernst, Thomas and Chengchi Wang. 1995. Object preposing in Mandarin Chinese. *Journal of East Asan Linguistics* 4.3:235-260.

Gieurts, Bart. 1998. The mechnisms of denial. *Language* 74.2:274-307.

Heim, I. 1982. *Semantics of Definite and Indefinite Noun Phrases.* Amherst: University of Massachusetts dissertation.

Huang, C.-T. James. 1982. *Logical Relations in Chinese and the Theory of Grammar.* Cambridge: MIT dissertation.

Huang, C.-T. James. 1987. Extential sentences in Chinese and (in)definiteness. In *The Representation of (In)definiteness*, ed. by E. J. Reuland and A. G. B. ter Meulen. Cambridge: MIT Press.

Huang, C.-T. James. 1990. Shuo Shi he You [On 'Be' and 'Have' in Chinese]. *Bulletin of the Institutue of History and Philogy* 59:43-64. Taipei: Academia Sinicia.

Huang, C.-T. James and Y.-H. Audrey Li. 1996 (eds.). *New Horizons in Chinese Linguistics*. Dordrecht: Kluwer Academic Publishers.

Huang, Shuanfan. 1981. On the scope phenomena of Chinese quantifiers. *Journal of Chinese Linguistics* 9:226-243.

Inhelder, B. and J. Piaget. 1958. *The Growth of Logical Thinking from Childhood to Adolescence*. New York: Basic Books.

Inhelder, B. and J. Piaget. 1964. *The Early Growth of Logic in the Child.* London: Routledge.

Ioup, Georgette. 1976. Some universals for quantifier scope. In *Syntax and Semantics 4*, ed. by John P. Kimball. New York: Academic Press.

Kayne, Richard S. 1994. *The Antisymmetry of Syntax.* Cambridge: MIT Press.

Keenan, E. 1971. Quantifier structures in English. *Foundations of Language* 7:255-284.

Kuno, Ssumu, Ken-Ichi Takami and Yuru Wu. 1999. Quantifier scope in English, Chinese and Japanese. *Language* 75.1:63-111.

Kuno, Ssumu, Ken-Ichi Takami and Yuru Wu. 2001. Response to Aoun and Li. *Language* 77.1:134-143.

Kwak, Hye-Young. 2006. Acquisition of the scope interaction between numeral quantifiers and negation in Korea: a descriptive study on production and comprehension. *Working Papers in Linguistics* 37.3:3-24. Honolulu: University of Hawaii at Manoa.

Lee, Thomas H.-T. 1986. *Studies on Quantification in Chinese.* Los Angeles: University of California at Los Angeles dissertation.

Lee, Thomas H.-T. 1991. Linearity as a scope principle for Chinese: the evidence from first language acquisition in Mandarin Chinese. In *Bridges Between Psychology and Linguistics,* ed. by D. Napoli and J. Kegl. Hillsdale: Lawrence Erlbaum.

Li, Y.-H. Audrey. 1987. Duration phrases: distributions and interpretations. *Journal of the Chinese Language Teachers Association* 3:27-65.

Li, Y.-H. Audrey. 1998. Argument determiner phrases and number phrases. *Linguistic Inquiry* 29.4:693-702.

Lidz, J. and J. Musolino. 2002. Children's command of quantification. *Cognition* 84:113-154.

McNeill, D. 1971. The capacity for ontogenesis of grammar. In *The Ontogenesis of Grammar*, ed. by D. I. Slobin. New York: Academic Press.

Musolino, J. (to appear) Structure and meaning in the acquisition of scope. In *Studies in Theoretical Psycholinguistics: Acquisition Meets Semantics*, ed. by L. Frazier, T. Roeper and K. Wexler. Kluwer Academic Press. Available at http://www.indiana.edu/~plp/chapter.pdf.

Musolino, J., S Crain and R. Thornton. 2000. Navigating negative quantificational space. *Linguistics* 38.1:1-32.

Paul, Waltraud. 2002. Sentence-internal topics in Mandarin Chinese: the case of object preposing. *Language and Linguistics* 3.4:695-714.

Philip, William. 1995. *Event Quantification in the Acquisition of Universal Quantification.* Amherst: University of Massachusetts dissertation.

Quine, W. 1960. *Word and Object*. Cambridge: MIT Press.

Shi, Yu-Zhi. 1992. Kending he Fouding de Duicheng yu Buduicheng [Symmetries and Asymmetries Beween Affirmation and Negation in Chinese]. Taipei: Student Book.

Shyu, Shu-ing. 1995. *The Syntax of Focus and Topic in Mandarin Chinese.* Los Angeles: University of Southern California dissertation.

Su, Yi-ching. (to appear) Structure and context effects in scope ambiguity resolution. *Language and Linguistics*.

Tsai, W.-T. Dylan. 1994. *On Economizing the Theory of A' Dependencies.* Cambridge: MIT dissertation.

Tsai, W.-T. Dylan. 2000. Object fronting and focus placement in Chinese. Paper presented at the International Symposium on Topic and Focus in Chinese. Hong Kong: Hong Kong Polytechnic University.

Vaidyanathan, R. 1991. Development of forms and functions of negation in the early stages of language acquisition: a study in Tamil. *Journal of Child Language* 18:51-66.

Zhu, Xiaoyu and Xiao Fan. 1999. Er-jia Dongzuo-dongci Xingcheng de Jigan Jumo [The Kernel Sentence Patterns with Two-Valence Action Verbs] *Yuyan Jiaoxue Yu Yanjiu* 1999.1:111-122.

Miao-Ling Hsieh
Department of English
National Taiwan Normal University
Taipei, Taiwan 106, ROC
mlhsieh@ntnu.edu.tw

範域的習得：一個以自然語料為基礎的個案研究

謝妙玲
國立台灣師範大學

本文以所收集的一個幼童由一歲到四歲多的自然語料為基礎，探討範域的習得。主要觀察的重點是否定詞與出現在動詞前的量化詞之間的範域關係。結果顯示此幼童在 3;2 對範域已有了初步的掌握，這個發現與其他的研究相比，在年齡上提前甚多（如：Lee 1991 推論幼童對範域的掌握需至 6 歲）。此外，根據此幼童從 4;3 開始，已能正確使用如：「都」和「有」的範域標記來標示出現在動詞前的全稱量詞、疑問詞和期間詞組，以及到了 4;5 以後便能根據否定詞的出現與否決定期間詞組應該出現在動詞前抑或動詞後來看，此幼童至此階段對於範距的掌握已臻成熟。