

The Acquisition of Mandarin Aspects and Modals: Evidence from the Acquisition of Negation^{*}

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This paper investigates three Mandarin-speaking children's corpora (1;9 through 2;1) to study their acquisition of aspects and modals. Their perfect distinction and use of the aspectual and modal negators, *mei* and *bu*, suggest the existence of AspectP and ModalP, which supports the Strong Continuity Hypothesis (Lust 1999). I argue that the lack of overt aspect markers and modals in their affirmative sentences is due to their aspect- and modal- marking mechanisms that are different from the adults', i.e. movement vs. licensing and overt operator vs. covert operator, which, however, are possible dialectal and cross-linguistic variations. The findings are consistent with the Principles-and-Parameters approach to child language development (Hyams 1986).

Key words: language acquisition, Mandarin, aspect, modal, negation

1. Introduction

In her well-known earlier work, Hyams (1992) motivates the existence of the IP projection on the basis of negation in child English. In the spirit of Pollock's (1989) split IP analysis, it is interesting to see if children acquire aspects and modals at the same time. Mandarin would be an ideal language for this study, because it has different negators for modals and aspects. Furthermore, from a comparative point of view, I am interested in learning what negation tells us about aspects and modals in child Mandarin.

Erbaugh (1982) reports early occurrence of the perfective aspect suffix *le* and the later emergence of modals. O. Lin (1986) points out the sequence of aspect acquisition: after *le*, progressive *zai*, and durative *zhe*, comes the experiential *guo*. Li (1990) shows that children have better perception when *le* is used with telic verbs and *zai* with activity and punctual verbs. Not too much work, however, has been done regarding younger children, for example, between one and two, and especially regarding their acquisition

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of Mandarin negation and modals.

In this paper, I examine three children's CHILDES (MacWhinney 2000) data (1;9.10 – 2;2.7) to study when and how they acquire Mandarin aspects and modals within the generative framework. Despite the paucity of aspect markings and modal verbs in affirmative sentences, these children show perfect distinction of *mei* and *bu*, the two negators for aspects and modals respectively. Also, children do better in the acquisition of aspects than that of modals. I argue that Mandarin-speaking children have aspect and modal projections from very early on, as predicted by the Strong Continuity Hypothesis (cf. Lust 1999). I then resort to the Principles-and-Parameters approach (Hyams 1986) to explain the optionality in children's affirmative aspect marking and modal use, i.e. movement vs. licensing and the employment of overt vs. covert operators. I attribute the imbalance between aspect and modal acquisition to the lexical complexity of the latter.

Sections 2 and 3 introduce Mandarin aspects and modals. Section 4 introduces Mandarin negation. Section 5 presents the CHILDES data and Section 6 discusses the data.

2. Aspects in Mandarin

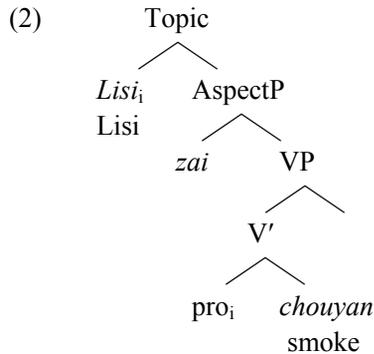
2.1 Progressive, durative and experiential aspects

Like other Chinese dialects, Mandarin has no tenses but four aspects (Li & Shirai 2000, Comrie 1976): two imperfectives: progressive and durative, and two perfectives: culminative and experiential. Aspect markers may either be pre-verbal or post-verbal, due to various grammaticalization processes (Chao 1968, Li & Thompson 1981, Li 1990, Wu 2004); therefore Li (1990) proposes not to treat Chinese aspect markers as a coherent class. This suggests that there are different mechanisms in Mandarin aspect marking and the children might employ different techniques to acquire different aspects, an idea that is to be supported in this paper.

The progressive aspect marker *zai*, for example, is preverbal as shown in (1):

- (1) *Lisi zai chouyan.*
Lisi ZAI smoke
'Lisi is/was smoking.'

H. Lin (1999) and Cheng (1995) generate *zai* in Asp(ect), marking the progressive aspect through verb-licensing. Also, as illustrated in (2), the external argument *Lisi* is base-generated in [Spec, TopicP], controlling a pro in [Spec, VP], since all Chinese subjects are topics in the left periphery (Li & Thompson 1981, Huang 1982):



The other imperfective aspect is durative, marked with *zhe* suffixed to the verb as shown in (3):¹

- (3) Lisi zhan zhe chifan.
 Lisi stand ZHE eat
 ‘Lisi stands while eating.’

The experiential aspect is marked with *guo* suffixed to the verb:

- (4) Wo qu guo Luoshanji.
 I go GUO Los Angeles
 ‘I have been to Los Angeles (before).’

2.2 The culminative perfective marker *le*

I shall discuss the culminative perfective marker *le* in greater detail.² As we shall see in §5, culminative perfective aspect is the first and the only aspect that can be identified in children’s speech at 1;9.10 through 2;2.7. This finding is in accordance with Li (1990) and Erbaugh (1982), though their subjects are much older than mine, Li’s being 3;11 to 6;4 and Erbaugh’s 2 to 3.³

¹ I shall not provide structures for *zhe*- and *guo*- suffixations, since they are not of interest in this paper.

² Chinese linguists (Chao 1968, Li & Thompson 1981, among many others) have been discussing the distinction between a sentence-final *le* and a verb-final *le*, the former a discourse marker and the latter a perfective marker; sometimes, the two *le*’s merge, for example when there is no object after the verb at the end of a sentence. No post-verbal object has been identified in the child data surveyed in this paper that involves aspect-marking; therefore, I shall not analyze the two *le*’s separately.

³ The earliness of *le* might be that conceptually the child associates *le* with the end-state or result

The interpretation and use of *le* are related to the Aktionsart of the verb it is suffixed to. When used with activity verbs, *le* indicates the completion of an action (Smith 1991), i.e. the apple-eating event in (5):

- (5) Wo chi pingguo le.
 I eat apple LE
 'I ate the apple(s).'

When *le* is used with stative verbs, which include adjectives in Mandarin (Li & Thompson 1981), it yields an inchoative reading (Comrie 1976) as in (6):

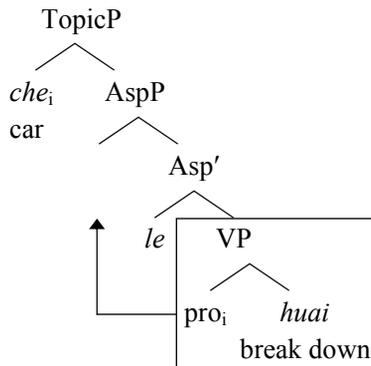
- (6) Wo zhidao le.
 I know LE
 'I know it now.'

Achievement verbs like *dapo* 'to break' must be marked for culminative perfective:

- (7) a. Beizi dapo le. b. *Beizi dapo.
 glass break LE glass break
 'The glass broke.'

I follow Wu (2004) in proposing the following structure for *le*:

- (8) Che huai le.
 car break-down LE
 'The car broke down.'



of the event expressed by the verb, which perceptually and cognitively constitute the most salient elements of the event structure, cf. Schulz & Wittek (2003).

In (8), the perfective marker *le* is base-generated in AspP°. V adjoins to AspP° to have its perfective feature checked against *le*, which is different from the derivation in (2), where the progressive marker *zai* licenses the verb, without triggering movement.

The difference between the perfective and progressive structures may be due to the fact that progressive aspect is unmarked, since it describes an action going on at the same time as the reference time; while there is a gap between the perfective action and the reference time. Consequently, perfective aspect has to resort to movement to have its marked feature checked. Or alternatively, *zai*, being a preposition ‘in or in the process of’ by nature is not a full-fledged aspect marker and therefore does not trigger movement (Nina Hyams, personal communication).

3. Modal verbs in Mandarin

The most commonly used modal verbs in Mandarin are shown in Table 1 (Li & Thompson 1981).

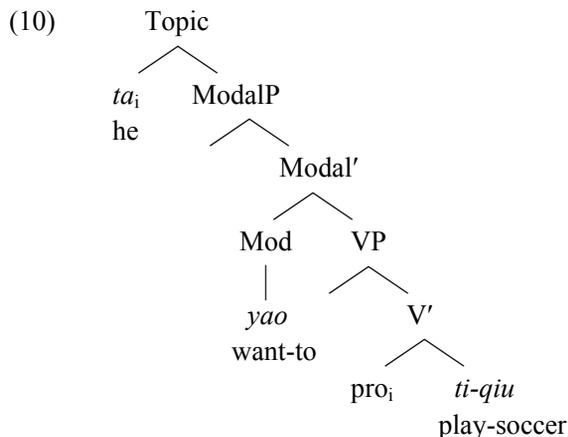
Table 1: Most common modal verbs in Mandarin

<i>yao</i>	<i>xiang</i>	<i>yuanyi</i>	<i>neng</i>	<i>keyi</i>	<i>hui</i>	<i>yinggai</i>	<i>bixu</i>	<i>dei</i>	<i>xuyao</i>
want to, need	want to, wanna	be willing to	can	can, be allowed to	can, might	should, must	must	got to, ought to	need

As shown in (9), the modal verb *yao* precedes the verb:

- (9) Ta yao tiqiu.
 he want-to kick-ball
 ‘He wants to play soccer.’

(10) is the structure for (9), which is parallel to that of *zai* in (2). In (10), it is the head of ModalP that licenses the verb; in (2) it is *zai*:



4. Negation in Mandarin

4.1 Negation of progressive, durative, and experiential aspects

There are three negators in Mandarin: *bu*, *mei-you*, and *bie* (Li & Thompson 1981, J. Lin 2003, H. Liu 2008).

To negate a sentence with aspect-marking, the negator *mei-you*, literally ‘not have’ or its more colloquial short form *mei* ‘not’ is used. (11a-c) illustrate the negation of progressive, durative, and experiential aspects. *Mei-you* or *mei* occurs before the aspectual marker *zai* or the verb suffixed with *zhe* or *guo*;⁴ in other words, Mandarin NegP is higher than AspP as well as ModalP, which I shall show in §4.3.

- (11) a. Lisi mei(-you) zai chouyan. (progressive aspect)
 Lisi MEI(-YOU) ZAI smoke
 ‘Lisi is/was not smoking.’
- b. Lisi mei(-you) zai wu li zhan zhe. (durative aspect)
 Lisi MEI(-YOU) in room inside stand ZHE
 ‘Lisi is/was not standing in the room.’
- c. Wo mei(-you) qu guo Luoshanji. (experiential aspect)
 I MEI(-YOU) go GUO Los Angeles
 ‘I have never been to Los Angeles.’

⁴ I propose in §4.2 that *you* is an NPI culminative perfective aspect marker. When *mei-you* is used to negate the progressive, durative, and experiential aspects, I argue that this is a result of reanalysis. Some speakers have taken *mei-you* as a generic aspect negator like *mei*.

4.2 Negation of the culminative perfect aspect

Negation of the culminative perfective aspect marked by *le*, however, is a little different from the above three examples: *mei-you/mei* and *le* are in complementary distribution as shown in (12):

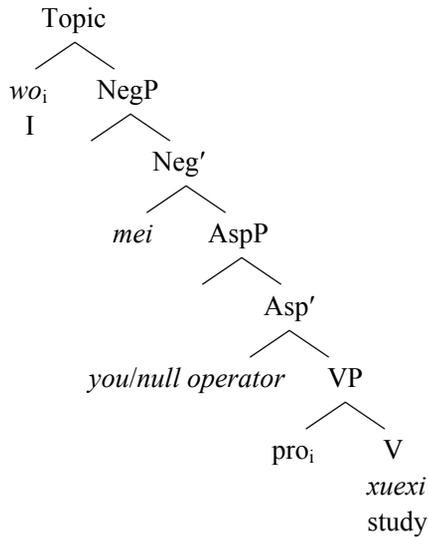
- (12) Wo mei(-you) xuexi (*le).
 I MEI(-YOU) study *LE
 ‘I haven’t/didn’t study.’

I argue that the short form *mei* ‘didn’t or haven’t’ is analytical, consisting of two morphemes: the negator *mei*, head of NegP, and the culminative aspect marker *you*, head of AspP. To be more specific, the post-verbal *le* marks the affirmative perfect aspect, while the pre-verbal *you* marks the negative perfective aspect. In fact, Cantonese, Min, and some Mandarin dialects use *you*, instead of *le*, to mark perfective:

- (13) Wo you xuexi. = wo xuexi le.
 I have study I study LE
 ‘I have studied.’

I argue that culminative perfective negation shares the same licensing structure as the progressive aspect marker *zai* and modals, cf. (2) and (10). As shown in (14), *mei* is in NegP and *you* in AspP; and the VP does not undergo movement. For the short-form *mei*, the NegP licenses a covert operator in AspP that functions as the overt *you* for aspect marking:

- (14) Wo mei(-you) xuexi.
 I MEI(-YOU) study
 ‘I didn’t study.’



Now, we can see that there are actually two mechanisms in Mandarin culminative perfective aspect-marking. In affirmative sentences, *le* triggers the VP to undergo movement for perfective interpretation; in negative sentences, *you* or a null operator selected by the aspectual negator *mei* licenses the verb.

4.3 *Bu-* and *bie-* negation

Unlike *mei*, *bu* is used to negate elements not marked for aspects. *Bu*-negation has different interpretations depending on the Aktionsart of the verb following it (F. Liu 2001). (15a) and (15b) show how stative verbs and modals are negated:

- (15) a. Ta bu congming. b. Ta bu xiang changge.
 he BU smart he BU want-to sing
 ‘He is not smart.’ ‘He doesn’t want to sing.’

When *bu* is used with activity verbs, the sentence becomes ambiguous between a habitual and a desirative reading (F. Liu 2001, Huang 1988, J. Lin 2003):

- (16) Ta bu kan dianshi. (F. Liu 2001:ex.(12a))
 he not watch TV
 ‘He does not watch TV.’ or ‘He does not want to watch TV.’

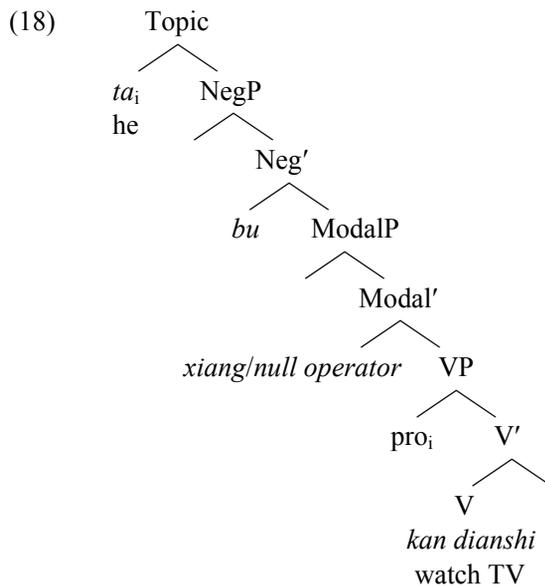
The person in (16) is either a habitual non-TV-watcher or is declining the offer to watch a TV program, if we go for the modal reading.

Similar to the treatment of the null operator in *mei* negation, J. Lin (2003) and Huang (1988) propose that there is a covert desirative modal operator under the negator *bu*, giving the verb the modal interpretation. Actually, the null operator in modal negation can only be recovered as *xiang* ‘to want to’ or its dialectal synonym *yao*, but not any other modal verb.⁵ (16), for example, can be paraphrased with the overt modal *xiang* ‘to want to’ inserted:

- (17) Ta bu kan dianshi. = Ta bu xiang kan dianshi.
 he BU watch TV he BU want-to watch TV
 ‘He is not willing/does not want to watch TV.’ (F. Liu 2001:ex.(12a))

This observation is sufficient for me to analyze the child data in §5.4, since I shall show that *xiang* ‘to want to’ is the only intended modal for the three children.

(18) is the structure for (17), which shows the similarity between aspect negation and modal negation in terms of the use of covert operator, which functions either as the overt aspect-marker *you* or the overt modal *xiang* (cf. J. Lin 2003 and Huang 1988):



⁵ I would like to thank a reviewer who pointed out that the null desirative modal operator can be recovered as *yao* too, which is more like a modal verb than *xiang*. Actually, among the 17 appearing modals in the 15 files examined, 7 of them are *yao* and 2 are *xiang*. I consider *yao* and *xiang* more or less dialectal synonymous variations, the former used more often in the South and the latter in the North. For argument’s sake, I use *xiang* to illustrate my points and assume that it behaves the same as *yao*.

5.1 *Le*

5.1.1 Methods

In this section, I study the acquisition of *le*. As mentioned in §2.2, *le* shows up much more often than *zai*, *zhe*, and *guo* in the files I study. *Zai*, for example, has only 3 occurrences, 2 in HY2 and 1 in HY4. Furthermore, in cases of omission, *le* is almost always the aspectual marker that can be recovered from context.

My criteria for an obligatory use of *le* include the context and the Aktionsart of the verb. The context refers to spontaneous utterances about a completed event, as in (20a). On the other hand, (20b) is an example showing how the obligatory use of *le* is identified through the lexical property of the achievement verb *dao* ‘to fall down’ that must be marked with perfective aspect, as discussed in §2.2.

- (20) a. In HY4: HY is trying to tie two things together so that it would look as if the former was stuck in the latter; he shows his father what he has bound the thing to:

HY: Ka zher le.

stuck here LE

‘(it) got stuck in here.’

Father: A, ka zher le.

ah stuck here LE

‘I see, (it) got stuck in here.’

- b. In LC4: LC is building a block tower and it falls down again:

LC: You dao le.

again fall-down LE

‘(it) fell down again.’

There are three criteria that I use to identify the improper omission of *le* in an obligatory context. First, discrepancy in imitation, as in (21a), where HY drops *le* when repeating what his mother has said to him; second, the context, as in (21b); and third, from the Aktionsart of the verb; for example, the achievement verb *po* ‘to be torn, worn out’ in (21c) should have been marked with the perfective marker *le*:

- (21) a. In HY1:

Mom: Xie huir, lei le.

rest a-bit tired LE

‘Let’s rest a bit; you are tired.’

HY: Xie huir, lei.

- b. In BB3:
 BB: Nainai qu nar (le)?
 Grandma go where (LE)
 ‘Where does Grandma go?’ (intended ‘where did Grandma go?’
 when he sees Grandma come in.)
 Mom (to interviewer):
 Ta nainai qu Hangzhou le.
 his grandma go Hangzhou LE
 ‘His grandma has been to Hangzhou.’
- c. In LC3:
 LC: Po (le).
 wear-out
 ‘It’s worn out.’

5.1.2 Findings

Table 4, Table 5, and Table 6 show the percentage of *le* occurrences and omissions in obligatory contexts for the three children, as well as their average percentage over the 5 files. Each table has two columns: ‘% of *le* Occurrences’ shows the percentage of *le* occurrences in obligatory contexts. ‘% of *le* Omissions’ shows the percentage of *le* omissions in obligatory contexts. Besides percentage, the number of actual tokens over the number of obligatory contexts is also given. If there is no related data in the file, the corresponding box is left empty.

Table 4: Percentage use of *le* in obligatory contexts: BB

	% of <i>le</i> Occurrences	% of <i>le</i> Omissions
BB1		
BB2		
BB3	80% (8/10)	20% (2/10)
BB4	100% (6/6)	0% (0/6)
BB5	100% (51/51)	0% (0/51)
Ave.	97% (65/67)	3% (2/67)

Table 5: Percentage use of *le* in obligatory contexts: HY

	% of <i>le</i> Occurrences	% of <i>le</i> Omissions
HY1	0% (0/118)	100% (118/118)
HY2	44.4% (4/9)	55.6% (5/9)
HY3	0% (0/59)	100% (59/59)
HY4	6% (3/50)	94% (47/50)
HY5	100% (67/67)	0% (0/67)
Ave.	29% (74/244)	71% (170/244)

Table 6: Percentage use of *le* in obligatory contexts: LC

	% of <i>le</i> Occurrences	% of <i>le</i> Omissions
LC1	0% (0/10)	100% (10/10)
LC2	7.1% (1/14)	92.9% (13/14)
LC3	6.25% (1/16)	93.75% (15/16)
LC4	14.2% (1/7)	85.8% (6/7)
LC5	0% (0/5)	100% (5/5)
Ave.	7.1% (3/42)	92.9% (39/42)

5.1.3 Summary

To sum up, none of the children has a perfect average in obligatory *le*-occurrences; the three children's overall 5-file average is 44%. BB does better than the other two, who has an 80% in file 3 and improves to 100% in file 4 and file 5. HY shows great improvement in file 5 compared with the previous four files. LC's rates are very low consistently for all five files.

Overall, BB has a high average of 97% for *le* in obligatory contexts, as seen from Table 4. He has a 100% in the last two files. In BB5 that has the highest MLU of 2.64, for example, there are 51 contexts of 17 different verbs that require obligatory *le*-occurrence and BB marks all of them.

As shown in Table 5 HY's average of obligatory *le*-marking is a very low 29%, 74 out of 244 contexts. There are large fluctuations in his performance. HY1 starts with a 0% of obligatory *le*-occurrences, failing to mark any of the 118 obligatory contexts. Neither HY2 nor HY4 shows a number higher than 50% in obligatory *le*-occurrences. HY5, however, shows a great leap to 100% of obligatory *le*-marking, 67 out of the 67 contexts for 21 different verbs. Without the 0% in HY1 that has skewed the overall average, HY's average would be 58%.

Table 6 shows the percentage of obligatory *le*-occurrences in LC's files. He has a

very low average marking rate of 7.1%, 3 out 42 contexts. Unlike BB5 and HY5 who have both 100%, LC5 has 0%. LC 2, LC3, and LC4 have 7.1%, 6.25, and 14.2%. I relate this to his relative low MLU, 0.92 on average vs. BB's and HY's 1.60 and 1.31.

5.2 *Mei-you/Mei*

5.2.1 Methods

In this section, I study how the aspectual negator *mei-you* or *mei* is acquired by the three children. As mentioned in §2.2, the perfective *le* shows up in a predominant proportion of my data, consequently the *mei-you/mei* in this section refers mostly to the negation of *le*.

The judgment whether a *mei* is correctly used is based mainly on context, as shown in (22). The correct use of *mei-you/mei* refers to whether the child makes the correct choice of the aspectual negator *mei-you* from among the three candidates: *mei*, *bu*, and *bie*, and if he or she obeys the rule that *le* and *mei-you* be in complementary distribution, as discussed in §4.2.

(22) a. In BB5:

Father: Na ni mai piao le ma?
 then you buy ticket LE yes-no-question
 'Then, did you buy the ticket?'

BB: Mei mai.
 MEI buy
 '(I) didn't.'

b. In HY1, when his mother wants to take away the Lego car:

HY: Che mei cha.
 car MEI assemble
 'The car was not assembled.'

Mom: Zheige cha hao le; yige fangkuair.
 this assemble good LE; a square
 '(But) this one was assembled already; a square.'

5.2.2 Findings

Table 7 shows the percentage of appropriate *mei*-occurrences based on the context. Empty boxes indicate that there is no relevant data in this category.

Table 7: Percentage of the appropriate uses of *mei* based on context

	File 1	File 2	File 3	File 4	File 5
BB				100% (1/1)	100% (3/3)
HY	100% (15/15)	100% (1/1)		100% (2/2)	100% (2/2)
LC			100% (5/5)	100% (3/3)	100% (3/3)

Despite the children's low average of 44% in marking the perfective aspect, their use of the aspectual negator *mei* is 100% in all the related files. We have also seen significant differences among the three children in terms of *le*-marking, either due to low MLU or fluctuating optionality. This is, however, not the case when it comes to *mei-you* negation. Although HY1, for example, does not mark *le* in any of the 118 required contexts, he negates a total of 15 sentences with *mei*. Although LC does poorly in *le*-marking, he marks all the needed *mei-you*'s. The children are always able to choose the right negator among the three candidates: *bu*, *bie*, and *mei* and exclude *le* when using *mei*.

5.2.3 Summary

We have now seen the differences between the obligatory *le*-occurrence and the obligatory *mei*-occurrence. No child has perfect *le*-scores until file 4 or file 5; the use of *mei*, however, is uniformly 100% correct from file 1 to file 5 for all the three children.

5.3 Modals

For the acquisition of modals, I investigate how modal verbs, both affirmative and negative, show up in obligatory contexts.

5.3.1 Methods

Examples from HY4 illustrate how judgments on obligatory contexts for modals are made. There are 13 contexts in which modals should occur. HY uses 6 of them.

- (23) In HY4:
- a. Mom: Neng zou ma?
 can run yes-no-question
 ‘Can (the car) run?’
 - HY: Neng zou.
 can run
 ‘(the car) can still run,’

- b. Wo xiang wan.
I want-to play
'I want to play,' (when his parents didn't allow him to touch a toy,
afraid that he might break it.)
- c. Bu hui.
BU know-how
'(I) don't know how,' (when his parents asked him to recite a nursery
rhyme.)

7 of the 13 needed modals are omitted:

- (24) a. HY: Wo (xiang) hua di.
I want-to paint floor
'I (want to) paint the floor,' (apparently he is not talking about his
habit as a painter but only his desire.)
(Mother: Let me ask you how old you are now; you should stop
behaving like a little child who draws things on the floor.)
- b. Mother: Haoyu, ni neng zou ma?
HY you can walk yes-no-question
'Can you walk, Haoyu?'
- HY: (neng) zou.
can walk.
'(I can) walk.'

5.3.2 Findings

Tables 8, 9, and 10 show the percentages of the occurrences and the omissions of modals in obligatory contexts, as well as each child's average percentage for their 5 files. Each table has two columns. '% of Modal Occurrences' shows the percentage of the occurrences of modals in obligatory contexts and '% of Modal Omissions' shows the percentage of the omissions of modals in obligatory contexts. Besides percentages, the number of actual tokens over the number of obligatory contexts is also given. If there is no relevant data in the file, the corresponding box is left empty.

Table 8: Percentage use of modals vs. null modals: BB

	% of Modal Occurrences	% of Modal Omission
BB1		
BB2	33% (1/3)	67% (2/3)
BB3	0% (0/2)	100% (2/2)
BB4	0% (0/3)	100% (3/3)
BB5	45.5% (10/22)	54.5% (12/22)
Ave.	36% (11/30)	64% (19/30)

Table 9: Percentage use of modals vs. null modals: HY

	% of Modal Occurrences	% of Modal Omission
HY1	0% (0/6)	100% (6/6)
HY2	100% (3/3)	0% (0/3)
HY3	50% (1/2)	50% (1/2)
HY4	46% (6/13)	53% (7/13)
HY5	37.5% (3/8)	62.5% (5/8)
Ave.	40% (13/32)	60% (19/32)

Table 10: Percentage use of modals vs. null modals: LC

	% of Modal Occurrences	% of Modal Omission
LC1	0% (0/30)	100% (30/30)
LC2	0% (0/9)	100% (9/9)
LC3	0% (0/18)	100% (18/18)
LC4	33% (4/12)	66% (8/12)
LC5	12% (1/9)	88% (8/9)
Ave.	6.4% (5/78)	93.6% (73/78)

5.3.3 Summary

To sum up, the overall average of modal-marking for the three children is 27.46%,⁶ much lower than the 90% threshold for complete acquisition suggested by Brown (1973). In only 33% of the 15 files, i.e. HY2, HY3, HY4, LC4, and LC5, are modals marked more frequently than *le*. Thus, overall, the children do better in their aspect-marking than in their modal-marking.

⁶ 17 modals are identified in positive context in the child data across the 15 files. 7 are *yao* 'want to', 4 are *neng* 'can'; *hui* 'know how to', *keyi* 'can', and *xiang* 'want to' each have 2 tokens.

BB has an average of 36% for obligatory modals, much lower than his average 97% *le*-marking. He does perfectly in the last two files for *le* acquisition, but has only 0% and 45.5% for modals.

HY has an average of 40% for obligatory modals, higher than his 29% in *le*-marking. HY2, HY3, HY4's modal-markings are all higher than their corresponding *le*-marking, especially HY2 which is 100%. HY5's modal marking, however, is lower than HY5's *le*-marking, 37.5% vs. 100%. But overall, if we exclude HY1 whose 0% aspect-marking has skewed the data, HY's average 58% in *le*-marking, would be higher than his modal marking.

LC has a slightly lower average of modal-marking than *le*-marking: 7.1% vs. 6.4%. In LC1, the percentage of modal-marking and the percentage of *le*-marking are both 0%; in LC2 and LC3 modal-markings are lower than *le*-marking, 0% vs. 7.1% and 0% vs. 6.25%; in LC4 and LC5 modal-markings are higher than *le*-marking: 33% vs. 14.2% and 12% vs. 0%. LC's overall modal use is lower than BB's and HY's, which might be due to his much lower MLU.

5.4 Modal negation

5.4.1 Methods

In this section, I study the acquisition of modal negation. As discussed in §4.3, there are two types of modal negation, *bu* + overt modal and *bu* + null modal operator. (25) is another example to show how the proper use of *bu* + overt modal is determined from the context, cf. (23c):

- (25) In HY5: Bu neng kai le.
BU can drive LE
'The car can no longer run/be driven,' (when he moves away a toy car that was broken.)

The appropriateness of the use of *bu* + null operator is also based on context, as shown in (26a-c). The judgment of correctness also refers to choosing the right modal negator *bu* and placing it before the modal.

- (26) a. In HY4: Mother: Jiao shen xie li.
foot stretch shoe inside
'Put your foot into the shoe.'
HY: Bu!
'No, (I don't want to)!'

- b. Bu qu.
BU go
'I don't want to go,' (when his mother tells him it's time to go to the kindergarten.)
- c. Wo bu zuo.
I BU sit
'I do not want to ride (it),' (when his mother asks him if he wants to sit on the motorcycle.)

5.4.2 Findings

Tables 11, 12, and 13 show the percentages of correct modal negation. The first two columns: *Bu* + Modal and *Bu* + null Modal correspond to the two kinds of modal negation. They show the percentage of correct use and the number of actual tokens over the number of obligatory contexts. The third column: Overall Mod. Negation, gives the overall percentage of correct modal negation and the actual counting, i.e. a sum of the preceding two columns. If there is no relevant data, the corresponding box is left empty.

Table 11: Percentage of correct modal negation: BB

	<i>Bu</i> + Modal	<i>Bu</i> + null Modal	Overall Mod. Negation
BB1		9/9	100% (9/9)
BB2			
BB3		11/11	100% (11/11)
BB4		1/1	100% (1/1)
BB5		29/29	100% (29/29)
Ave.			100% (50/50)

Table 12: Percentage of correct modal negation: HY

	<i>Bu</i> + Modal	<i>Bu</i> + null Modal	Overall Mod. Negation
HY1		100% (1/1)	100% (1/1)
HY2	25% (1/4)	75% (3/4)	100% (4/4)
HY3			
HY4	60% (3/5)	40% (2/5)	100% (5/5)
HY5	100% (3/3)		100% (3/3)
Ave.			100% (13/13)

Table 13: Percentage of correct modal negation: LC

	<i>Bu</i> + Modal	<i>Bu</i> + null Modal	Overall Mod. Negation
LC1			
LC2		3/3	100% (3/3)
LC3		3/3	100% (3/3)
LC4		8/8	100% (8/8)
LC5		13/13	100% (13/13)
Ave.			100% (27/27)

5.4.3 Summary

Unlike the low rate of modal marking in §5.3, the rate of modal *bu*-negation for all the children is 100% in all the files, with either overt or covert modals.

From the contexts provided in §5.4.2, we can tell that the majority of the modals the children use are *xiang*; for example except for HY2 who uses 1 *bu-hui* ‘cannot’ out of 4 negative cases, HY4 who uses 3 *bu-hui*’s ‘cannot’ out of 5 negative cases, and HY5 who uses 3 *bu-neng*’s ‘not allowed’ out of 3 negative cases, BB and LC do not use any modals other than *xiang* ‘to want to’. All their modal negations are in the form of *bu* + null-operator, with desiderative interpretation that can be justified through the context. I have shown in 3 that *xiang* ‘to want to’ is the only modal that can be omitted in *bu*-negation.

Compared with what we saw in §5.3, the children do a much better job in modal negation than in affirmative modal use.

Overall, all of the three children perform perfectly in aspect and modal negation. The affirmative aspect- and modal- markings are still not perfect, with the former being better than the latter.

6. Discussion

Overall, all of the three children perform perfectly in aspect and modal negation. The affirmative aspect- and modal- markings are still not perfect, with the former being better than the latter.

6.1 Evidence of AspP and ModP from negation

Judging from the data of affirmative aspects and modals alone, I would not argue that AspP and ModalP exist in child Mandarin. HY and LC, for example, show very low percentage of obligatory *le*-marking; and none of the children scores higher than

50% on average in their modal marking. On the other hand, no child ever makes a mistake in aspectual or modal negation: they always chose the right negator: *mei* for aspect negation and *bu* for modal negation and they put the negator before the verb or the modal.

A bare verb in child Mandarin may have either an aspectual interpretation or modal reference, but once it is attached to a negator, such ambiguity disappears, thanks to the fact that Mandarin has different negators for aspects and modals. I have discussed the fact that *mei-you/mei* + null-aspect-operator marks both negation and culminative perfective aspect and that a null desiderative modal operator can be identified in ModalP when it is licensed by *bu* (J. Lin 2003, Huang 1988).

The children's perfect use of the perfective and modal negators indicates that their grammar has aspectual and modal projections. Compared with the acquisition of English (Hyams 1992), learning how to negate is harder in Mandarin: the child must choose from the three negators *bu*, *meiyoun/mei* and *bie*. Although the imperative negator *bie* is frequently found in the caretaker's input (Tardif 1993, Lee 1996), none of the children uses *bie* as the default negator. Such a clear distinction shows that the children are aware of the substructure within IP, i.e. ModalP and AspectP (Pollock 1989). The perfect perfective and modal negation from the first files, as early as 1;9, suggest that the children have ModalP and AspP from the very beginning.

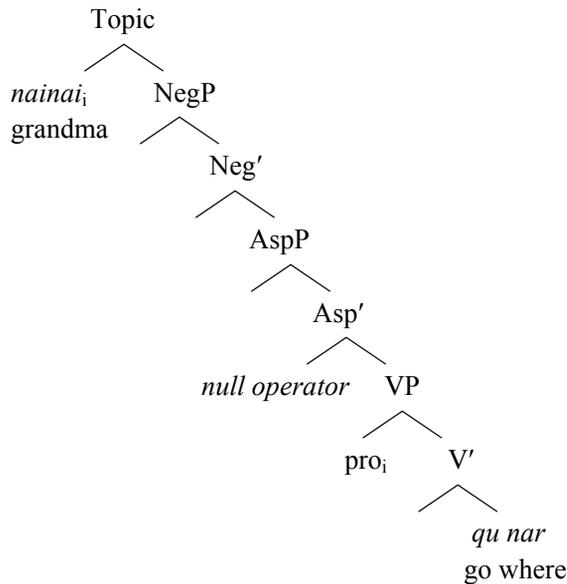
6.2 Why imperfect affirmative aspects and modals?

Given the fact that children have both ModalP and AspectP at an early age, why are their affirmative aspectual and modal markings far from perfect?

First, recall that we have talked about the two possible ways of marking aspects in Mandarin: adjoining of the VP to AspP^o in affirmative culminative aspect marking, as shown in (8), and *you* or the null-operator licensing the verb as shown in (14).

I argue that the children use the licensing mechanism for both affirmative and negative aspect markings, which adults would only use in negative cases. Furthermore, the children employ a null-operator licenser in affirmative cases, which the adult would use only in negative sentences. An example from BB3 illustrates the point: in (27), a null-aspect operator licenses the verb *qu* 'to go to' and gives it perfective marking. Note the similarity between (14) and (27), the former being the adult's formation of negative aspect, and the latter the children's formation of affirmative aspect:

- (27) BB3: Nainai qu nar (le).
 grandma go where
 intended: 'where did grandma go?'



The avoidance of movement is out of minimalist concerns, i.e. the simplicity of operator licensing over movement (cf. Chomsky 2001). Déprez & Pierce (1994) also use ‘economy’ to talk about the optionality observed in children’s speech.

It was also shown in (14) that the null operator is licensed by the head of negation. What then licenses the null operator in child Mandarin when there is no overt negation above it? I follow Laka (1994)’s proposal for a more abstract Σ P based on her study of Basque that licenses both NegP and Aff(irmation)P. For example, the optional emphatic *ba* and the negative *ez* are argued to be both licensed by Σ P. AffP is similar to English do-support as in ‘I do know him.’

- (28) Arantza (ba) du Jonek maite!
 Arantza indeed have Jonek maite
 ‘Arantza (is who) Jon indeed has loved’
- (29) Miren ez du Jonek maite!
 Miren not have Jonek love
 ‘Miren (is who) Jon hasn’t loved’

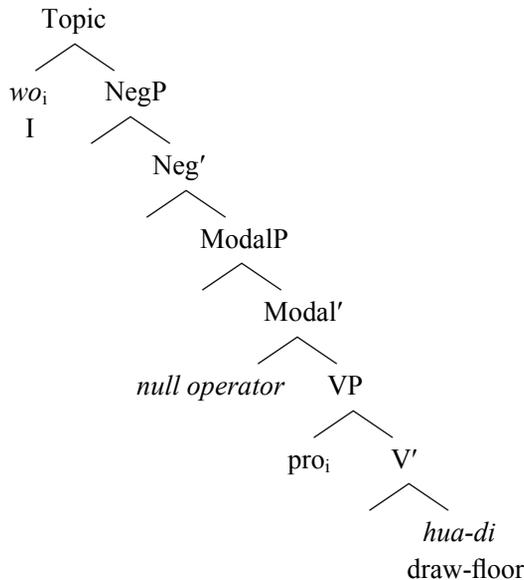
So, Mandarin-speaking children resort to Σ P for null-operator licensing in affirmative sentences and to NegP for null-operator licensing in negative sentences, a point I shall revisit when discussing null-operator in modals, i.e. example (30).

The children’s use of licensing in affirmative perfective marking, however, would

not be a wild card, considering that some dialects of Mandarin do use *you*-licensing for affirmative aspect, as shown in (13).

I can extend my analysis to why the children drop modals in their affirmative sentences: they make use of null-modal-licensing to realize modality in affirmative sentences, the mechanism restricted to negative sentences in adult grammar. Let us compare (18), the adult's formation of modal negation and the structure of (30), a sentence from HY4.

- (30) Wo (xiang) huadi.
 I want-to draw-floor
 'I (want to) draw the floor.'



Although in adult grammar, the null-operator option exists only in negative sentences, it shows up in both affirmative and negative sentences in children's speech. Again, I follow Laka (1994) arguing that the null-operator in affirmative sentences is licensed by Σ P.

The findings in this paper are in line with the Strong Continuity Hypothesis (Lust 1999, Poeppel & Wexler 1993), which asserts that children have full clause structure and functional categories in the very beginning. Phillips (1995) also argues that children do not have deficits in their syntactic structures, and the differences between their grammar and that of the adults' are caused by the implementation of certain aspects of grammar.

Though he emphasizes a processing explanation, this paper offers an explanation from the point of view of the Principles-and-Parameters approach (Hyams 1986). Children do not move the VP but rather choose a more unmarked licensing structure with a covert operator in [Head, AspP]; this operator is available in adult grammar, but with a different distribution. By the same token, children choose to have a covert operator in [Head, ModalP] in both negative and affirmative sentences.

6.3 Why earlier acquisition of aspects than modals?

What, then, prevents the children from using an overt modal verb in affirmative sentences, when there is no complex movement? And why do they do better in marking an aspect than using a modal, given the fact that they have acquired both projections? Erbaugh (1982), for example, notes that up to 2;4, modals remain rare, except in answers to adult questions.

The lexical complexity of modals might be a reason for the delayed acquisition. While there are only four aspect markers in Mandarin; there are, however, at least ten modal verbs in Mandarin. It would be difficult for children to choose the right modal verb from all these candidates; as a result, the children uniformly use only the mechanism of a null-operator. The abstractness of modals may also address to the imbalance between aspect and modal markings.

Interestingly, the phenomenon of modals first being associated with negation is also found in child Dutch and child English. Klima & Bellugi (1973) notice that in their Period 1, English auxiliary verbs always emerge first in negative contexts. They argue that this is due to the absence of positive counterparts; the child construes the negative + modal as an analytical negative element, instead of negator + modal. Hoekstra & Jordens (1994) report that Dutch children, around age 1;7 to 1;11, use *kan* 'can' and *mag* 'may' only in negative sentences, in the form of *kannie* 'cannot' and *magnie* 'may not', respectively. They argue that modal negations are treated by children as adjuncts on a verbal projection. The tendency of children using more *bu* + Null operator than *bu* + Modal might also be related to children's analysis of the former as an analytical constituent.

6.4 Concluding remarks

Now, let me address the questions raised in §5. First, judging from BB, HY, and LC's perfect use of both the aspectual and modal negators as early as 1;9, I conclude they have the corresponding projections from the very beginning, which supports the Strong Continuity Hypothesis. Second, data from Mandarin progressive aspect-marking

and from other Chinese dialects indicate that the lack of overt aspectual and modal marking in their affirmative sentences is due to children's utilization of mechanisms different from those of the adults: movement vs. licensing, and overt operator vs. covert operator in ModalP and AspectP. Third, the abstractness of modality and its lexical complexity shed light on why children have better aspect marking than modals.

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從否定獲得來看中文兒童的體與情態獲得

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本文通過調查三名兒童的語料 (1;9-2;1)，研究他們如何習得中文的體和情態動詞。他們對中文兩個否定詞「不」和「沒」的成功區分反映了他們的語法已經擁有體和情態動詞的相應結構，從而印證了強連續性假說 (Lust 1999)。我分析兒童體和情態動詞在肯定句中的缺失是由於他們所運用的標誌方法不同於成人語法，例如，他們使用隱性運符的准許結構，成人使用顯性詞彙移位結構。而兒童的所運用的規則在其他語言或方言中並不罕見，這也符合原則參數語法關於兒童語言發展的預測 (Hyams 1986)。

關鍵詞：語言習得，中文，體，情態動詞，否定式