J. Child Lang. **27** (2000), 421–435. Printed in the United Kingdom
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NOTE

Temporal reference in Chinese mother–child conversation: morphosyntactic, semantic and discourse-pragmatic resources*

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(*Received* 14 *December* 1998. *Revised* 15 *November* 1999)

ABSTRACT

This paper explores two Mandarin-speaking children's (3;2 and 3;3) ability to refer to the past in mother–child conversation. The approach encompasses morphosyntactic, semantic and discourse-pragmatic perspectives. The results show that the children tend to refer to immediate past spontaneously, but rely heavily on elicitation when referring to earlier past. It is suggested that maternal scaffolding functions as a discourse support for children to participate in conversation involving earlier past. When establishing past reference with overt temporal markers, the children resort mainly to aspect markers. In addition, they also rely on semantic and discourse-pragmatic resources for temporal inferencing, such as inherent semantic aspect, shared background knowledge and situational context.

INTRODUCTION

Research on child language acquisition has shown that children's speech at the early stage of development is restricted to the 'here-and-now' (Brown, 1973; Sachs, 1983; Eisenberg, 1985; Weist, 1989). The development of the capacity to refer to objects and events temporally displaced from the present represents a crucial conceptual and linguistic breakthrough for young children. Thus, how children learn to talk about the there-and-then has been of much interest to researchers in linguistics and psychology.

[*] I would like to express my appreciation to the participating families for their kindly support. I would also like to thank Roger Andersen, Terry Au, John Schumann, Noriko Akatsuka and the two anonymous reviewers for insightful comments. An earlier version of this paper has been presented in November 1998 at the 23rd Annual Boston University Conference on Language Development and has appeared in the proceedings. Address for correspondence: Chiung-chih Huang, Department of Foreign Languages and Literature, Tunghai University, Taichung, Taiwan 40704. e-mail: chiung@mail.thu.edu.tw.

https://doi.org/10.1017/S0305000900004189 Published online by Cambridge University Press

Many previous studies on the acquisition of temporality have focused on the emergence of morphosyntactic marking in child language, particularly tense-aspect marking. These studies investigated the relation between the initial tense-aspect marking and children's conceptual development of temporal/aspectual distinctions. One central issue in these acquisition studies of tense and aspect is whether children's early tensed utterances express aspectual or deictic relations, and whether children's tense-aspect marking is influenced by the inherent semantic aspect of verbs/predicates. (Bronckart & Sinclair, 1973; Antinucci & Miller, 1976; Bloom, Lifter & Hafitz, 1980; Weist, Wysocka, Witkowska-Stadnik, Buczowska & Konieczna, 1984; Li, 1990; Shirai, 1991; Shirai & Andersen, 1995; Li & Bowerman, 1998).

Since Mandarin Chinese is tenseless but aspect-prominent, previous studies on Chinese children's acquisition of temporality have concentrated on the emergence and development of aspect markers. It has been reported that the perfective marker *le* emerges before the imperfective markers *zai* (progressive) and *zhe* (durative), which in turn appear before the experiential marker *guo* (Erbaugh, 1978, 1992; Lin, 1986). The perfective marker *le* has been found to be particularly relevant to past time reference. Erbaugh (1985) studied two children of two years and reported that 85% of early *le* referred to the past. In addition, among all the occurrences of *le* referring to the past, 96% referred to the immediate past. Erbaugh investigated the features which were correlated with the occurrence of *le* perfective, and suggested that five contextual factors trigger the perfective in child Mandarin. From most to least important, these are : (1) pastness of event; (2) clear end point; (3) re-enactment potential; (4) transitivity, and (5) agentivity.

Li (1990) and Li & Bowerman (1998) investigated the association between inherent semantic aspect and aspect markers in Mandarin-speaking children's (3;0–6;0) speech. The results show a strong association between perfective aspect and resultative/telic verbs and between imperfective aspect and atelic verbs. The authors suggested that the results confirm Slobin's (1985) Basic Child Grammar, which claims that Result and Process are the semantic notions with which children associate tense-aspect markers.

As seen in the studies reviewed above, children's development of temporality was investigated through the analysis of tense-aspect marking. While tense and aspect markers constitute important elements in expressing temporality, several researchers (e.g. Schumann, 1987; Andersen, 1990; Klein, 1995) have pointed out the necessity of also examining various other means available to express temporality. As suggested by Klein (1995), the 'inflectional paradigm bias' yields only an incomplete picture of the developmental process of temporality.

Rather than focusing on temporal markers, other studies have focused on the emergence of children's intention to refer to temporal displaced reference.

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These studies examined children's reference to the past/future by investigating the content of the conversation, the role of an adult conversational partner, and the context in which such talk occurs (e.g. Sachs, 1983; Eisenberg, 1985; Lucariello & Nelson, 1987). Eisenberg (1985) examined conversations between two Spanish-speaking girls (1;9–2;7 and 2;0–3;2) and their families, focusing on the development of the children's ability to discuss past experiences. The author identified three phases of development. In the first phase, the most characteristic feature of the conversations was the dependency on adult participation. The children rarely introduced a past event as the topic and only produced two or more utterances about a topic when requested to do so. In the second phase, only half the children's descriptions of past events were elicited. Most of the events that the children described were highly familiar to the children. In the third phase, very few of the children's descriptions of the past had to be elicited. The children began to talk about unique occurrences, but had difficulty in planning a lengthy discourse.

Lucariello & Nelson (1987) examined temporal displaced talk between ten English-speaking children (2;0–2;5) and their mothers. The results show that talk involving temporal displacement occurred almost exclusively in the scripted (or routine) context and its topics were predominately based on other routine activities. The authors suggested that the dyad shared event knowledge for the scripted context and that such knowledge created a context for the occurrence of temporal displaced talk. Maternal talk was characterized by the use of adverbial temporal markers, hypothetical and conditional expressions, conversational routines, and wh-questions. The authors argued that these aspects of maternal speech indicate scaffolding and may facilitate the child's acquisition of temporal displaced talk.

Sachs (1983) studied the emergence of displaced reference in her daughter's utterances in English. She made tape recordings of parent–child interaction when her daughter was between 1;5 and 3;0, and found that the first reference to the past was produced at 1;10. In this particular utterance, the topic concerned an event that had just occurred. At 2;3, the topics broadened to include activities and events that had occurred within the current day. Future reference and more distant past reference did not begin to appear until about 2;8–3;0.

These previous studies have identified several characteristics of children's initial conversation about displaced reference: the predominance of the adult's scaffolding, the reference to routine events and the reference to the immediate past/future. However, little research has been done to further investigate how children initiate and establish temporal reference, and how children's linguistic and extralinguistic capabilities contribute to the accomplishment of referential communication. The purpose of this study is to address these issues. More specifically, this study investigates how two

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Mandarin-speaking children (3;2 and 3;3) refer to the past, focusing on how the children contribute to the conversation by initiating and establishing past time reference. The research questions of the study are as follows:

(1) What kinds of past reference are involved in the children's speech, immediate past reference or distant past reference?

(2) What is the children's interactive role in conversations which involve the different kinds of past reference? That is, do they tend to refer to the past spontaneously or do they tend to rely on the mothers' elicitation?

(3) How do the children initiate and establish past reference? What overt temporal markers do they use? What are the functions of these markers? When no temporal markers are used, how can the implicit temporal reference be inferred?

To go beyond the 'inflectional paradigm' mentioned above, this study adopted a broader approach, which encompasses morphosyntactic, semantic and discourse-pragmatic perspectives. This approach is especially suitable for studying Mandarin Chinese, which is a tenseless language. That is, in the temporal system of Mandarin Chinese, no grammatical morphemes are used to signal the time of a reported event relative to the time of speaking (Li & Thompson, 1981). Therefore, when interpreting Mandarin temporal reference, it is crucial to take into account the interplay of various linguistic and extralinguistic devices. In order to investigate these various devices, we need to examine children's speech in discourse, where temporality can be analysed in terms of its communicative and interactive functions. Therefore, in this study the children's speech was examined within the dynamic course of mother–child conversation. Reference to the past was analysed in terms of how the child and the mother accomplished the communicative intent interactively. By adopting this broader approach, this study attempts to provide a more complete picture of how temporal reference is manifested in a tenseless language like Mandarin, and how it is conveyed in mother–child conversational interaction.

METHODS

Subjects and data

The subjects of this study were two Mandarin-speaking children, Weiwei and Tingting (pseudonyms), who live in Taiwan. At the time of data collection, Weiwei, a boy, was three years and three months old, and Tingting, a girl, was three years and two months old. Data collection was conducted in the subjects' homes. Natural interactions between the children and their mothers were audio- and video-taped. Sometimes other family members were also present during the data collection sessions and participated in the interaction. The researcher occasionally also took part in the interaction when it seemed natural and appropriate. The recording was conducted

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within a two-week period for each child. The data analysed in this study include six hours of Weiwei's recording and six hours of Tingting's recording.

The data were transcribed using the Pinyin system of romanization. The transcript follows the CHAT conventions (MacWhinney, 1994), and the quantitative analysis was conducted using CLAN (MacWhinney, 1994).

Coding procedures

Each of the children's past time utterances was identified and was coded with the following different past time frames: (1) Immediate past; (2) Recent past; (3) Same-day past; (4) Distant past and (5) Indeterminate past. Immediate past involves events that have just occurred, usually a few seconds before the speech. Recent past involves events that have occurred within about an hour before the speech. Same-day past refers to events which have occurred on the same day of the speech, and Distant past refers to events that are further removed in time, i.e. events that have occurred before the day of the speech.

Each of the children's past time utterances was also coded for its interactive role in conversation as either SPONTANEOUS or ELICITED. Each spontaneous utterance was then coded as either INITIATIVE OR NON-INITIATIVE, i.e. whether the spontaneous utterance initiates a new time frame. Each initiative utterance was further coded as either MARKED or UNMARKED, i.e. whether an overt temporal marker was used for the initiation. For each marked initiation, the type of temporal marker was identified as either aspect marker, adverb, or adverbial clause.

RESULTS

In the data, Weiwei produced 2491 utterances in total, among which 271 utterances (11%) referred to the past. Tingting produced 2423 utterances, among which 634 utterances (26%) referred to the past. The numbers of past time utterances indicate that both children demonstrated the ability to talk about events beyond the here-and-now.

As mentioned above, the children's past time utterances were further classified into different categories, according to the degree of pastness. In addition, for each category, the utterances were identified as being either spontaneously produced by the child or elicited by the mother. Table 1 displays the results.

As seen in the table, both children were able to refer to events of the various degrees of pastness. While Erbaugh's (1985) two subjects (both 2;0) and Sachs's (1983) subject (from 1;8–2;1) were reported to produce more immediate past references than other earlier references, our results show that Weiwei and Tingting referred to same-day past and distant past more frequently than immediate past. Since Weiwei and Tingting (3;3 and 3;2) were older than Erbaugh's and Sachs's subjects, the results may indicate that

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TABLE 1. *Children's past time utterances*

Degree of pastness	Weiwei			Tingtin		
	N	Elicited (%)	Spontaneous (%)	*N*	Elicited (%)	Spontaneous (%)
Immediate	25	8	92	26	31	69
Recent	8	63	37	51	59	41
Same-day	81	81	19	399	65	35
Distant	129	67	33	87	74	26
Indeterminate	28	68	32	71	54	46

TABLE 2. *Temporal markers used for establishing past references*

Temporal markers	Weiwei (%)	Mother (%)	Tingting (%)	Mother (%)
Aspect markers	31 (61)	29 (28)	29 (57)	26 (21)
Adverbs	3 (6)	54 (51)	5 (10)	65 (54)
Adverbial clauses	5 (10)	1 (1)	0 (0)	2 (2)
Unmarked	12 (23)	21 (20)	17 (33)	28 (23)
Total	51 (100)	105 (100)	51 (100)	121 (100)

Weiwei and Tingting had developed the ability to participate more readily in conversations involving earlier past. However, as also shown in the table, both Weiwei and Tingting referred to immediate past spontaneously most of the time, but they relied heavily on their mothers' elicitations when referring to non-immediate past. It appears that the children's abilities to refer to the non-immediate past had not yet fully developed. In Table 1, we also observed that Weiwei referred to distant past most frequently, but Tingting referred to same-day past most frequently. This discrepancy can be largely attributed to the fact that Weiwei's mother engaged Weiwei in conversation about distant past more frequently, whereas Tingting's mother tended to engage Tingting in conversation about same-day past. In other words, in the mother–child conversation about earlier past, the mother played an important role in determining what to talk about in conversation.

Because of the unbalanced roles the mother and the child played in the conversational interaction, the burden of establishing the time frames fell mostly on the mother. However, the analysis also reveals that the children were able to establish some of the past references. Table 2 demonstrates the temporal markers used by the children and the mothers for establishing past references.

The results show that when the children established past references, they resorted mostly to aspect markers. In contrast, when the mothers established

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past references, they tended to use temporal adverbs. It appears that Weiwei and Tingting were not proficient at using temporal adverbs yet. This finding is consistent with the findings in Eisenberg (1985), Erbaugh (1985) and Weist (1989), which also report that temporal adverbs are more difficult than tense-aspect markers for children to acquire. Table 2 also shows a noticeable number of unmarked initiations in the children's and the mothers' speech. That is, these past references were established without any overt temporal markers.

Further analysis was conducted to investigate what kinds of aspect markers were used by the children. The analysis shows that the children used the perfective marker *le* most frequently to establish past references. They tended to use *le* with resultative verbs (Weiwei 68%, Tingting 72%) and for establishing immediate past reference (Weiwei 88%, Tingting 66%). The events described often involved the children themselves as the agent, or they may used *le* to describe the change of state of a visible object. Example 1 is an example of the use of *le* from Weiwei's data. In this example, Weiwei was holding a toy lion. He was kissing the toy lion when the mother noticed that there was saliva on the toy.

Example 1 (MOT: mother; WEI: Weiwei)
1 *MOT: ni kan dou shi koushui.
you see all be saliva
'You see, it's all saliva.'
2 *WEI: ca-diao [% said while wiping the toy lion].
wipe-off
'(I am) wiping (it) off.'
3 *WEI: ca-diao le [% said after finishing the wiping]. ←
wipe-off PFV
'(I) wiped (it) off.'

In example 1, we note that utterance 2 and utterance 3 are identical except that there is a *le* at the end of utterance 3. While utterance 2 was said when the action 'wiping' was going on, utterance 3 was said after the action had finished. In other words, *le* here was used to indicate that the action denoted by the resultative verb *ca-diao* ('wipe out') had just been completed in the immediate past. In this example, the child was the agent of the event.

Another example is shown in Example 2, which is from Tingting's data. In Example 2, Tingting was telling her mother that the tape recorder, which was used for the data collection, had finished recording and had stopped.

Example 2 (MOT: mother; TIN: Tingting)
1 *TIN: mama zhe ge lu-wan le. ←
Mom this CL record-finish PFV
'Mom, this (= tape recorder) finished recording.'

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2 *MOT: ha?
PRT
'Hunh?'
3 *TIN: zhe ge la [% pointing at the recorder].
this CL PRT
'This.'
4 *MOT: na haiyou zhuan quanquan a.
that still turn circle PRT
'That is still turning.'
5 *TIN: meiyou.
not
'(It's) not (turning).'

Note that in utterance 1, Tingting used the perfective marker *le* with a resultative verb *lu-wan* ('finish recording'). The perfective marker *le* was also used here to indicate that the event of recording had been completed in the immediate past. In this case, Tingting used *le* to describe the change of state of a visible object (the recorder).

In addition to the perfective marker *le*, the children also used the experiential marker *guo* to establish past reference. In contrast with *le*, the experiential *guo* was used for establishing distant past reference. The events mentioned usually involved the child himself as the agent or the experiencer.

Example 3 is an example of Weiwei's use of *guo*. In Example 3, the mother asked Weiwei whether he could sing the nursery rhyme 'Two Tigers'. Weiwei, however, responded that he had seen a tiger before.

Example 3
1 *MOT: ni hui bu hui chang liang zhi laohu nei?
you can not can sing two CL tiger PRT
'Can you sing ''Two Tigers''?'
2 *WEI: wo kan guo a. ←
I see EXP PRT
'I have seen (it).'
3 *MOT: kan guo shenme?
see EXP what
'What have (you) seen?'
4 *WEI: kan guo laohu gege a.
see EXP tiger brother PRT
'(I) have seen brother tiger.'

In this example, Weiwei established the distant past reference in utterance 2, where he used the experiential marker *guo* to describe his own past experience of having seen a tiger before. Since the child had to rely on his memory to describe distant past events, those events which involved the

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child himself as the agent or the experiencer appeared to provide more vivid memory for the child to describe.

As seen in the above examples, the children used the aspect markers *le* and *guo* to indicate deictic temporal relations. That is, they used the speech time as the reference time and used the aspect markers to indicate that the events mentioned happened and were completed right before or more remotely before the speech time.

As for temporal adverbs, the results show that the children's access to temporal adverbs appears to be rather limited. In fact, only three types of temporal adverbs were used by the children to establish past reference: Weiwei used *ganggang* ('just now') twice and its variant *gangcai* ('just now') once to establish recent past reference. Tingting used *ganggang* ('just now') four times to establish recent past reference and *zhongwu* ('noon') once to establish same-day past reference. Therefore, *ganggang* was the most often used temporal adverb for both of the children. The following is an example of Tingting's use of the adverb *ganggang*.

Example 4
(Tingting is imitating the way her sister made a funny face a while ago.)

1 *TIN: ganggang er jie bizi xiang zhe yang. ←
just now second older sister nose like this way
'Second Older Sister's nose was like this just now'

2 *MOT: zhe yangzi hao chou ou, hou?
this way so ugly PRT PRT
'(It looks) so ugly this way, right?'

3 *MOT: ni juede hui chou ma?
you think AUX ugly Q
'Do you think it's ugly?'

4 *TIN: bu hui.
not AUX
'No.'

In utterance 1, Tingting used the adverb *ganggang* to establish a recent past reference to describe the event of her sister's making a funny face.

As mentioned above, in addition to the adverb *ganggang*, Tingting also used the adverb *zhongwu* ('noon'). Note that this adverb is a referential adverb, which sets an external reference point. Interestingly, while Weiwei never provided a referential temporal adverb in the data, he used temporal adverbial clauses five times to establish external temporal reference. Example 5 represents an example of Weiwei's use of a temporal adverbial clause.

Example 5
(Weiwei and his mother are reading a storybook, and Weiwei is pointing at a picture of a boy in the book.)

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1 *WEI: ta lian hen chou.
3sg face very ugly
'His face is very ugly.'
2 *MOT: ta bu chou a.
3sg not ugly PRT
'He is not ugly.'
3 *MOT: ta hen piaoliang a.
3sg very good-looking PRT
'He is very good-looking.'
4 *WEI: ta xiao shihou hen chou ye. ←
3sg little when very ugly PRT
'He was very ugly when he was little.'
5 *MOT: ta xiao shihou mama meiyou kan guo a.
3sg little when mother not see EXP PRT
'I never saw him when he was little.'

In Example 5, Weiwei used a when-clause in utterance 4, which established an external reference point in the distant past.

As we have observed in Table 2, there was a noticeable number of unmarked initiations in the children's speech. The analysis shows that these implicit temporal references could be inferred from various semantic and discourse-pragmatic resources, such as inherent semantic aspect of verbs, situational context, and shared knowledge.

It is found that the children's unmarked initiations of past reference were mainly related to the immediate situational concern. Example 6, from Tingting's data, is an example of unmarked initiations in the children's speech.

Example 6

1 *MOT: zheli liu xie [% looking at her right hand].
here shed blood
'It's bleeding here.'
2 *TIN: zai nali diedao? ←
at where fall
'Where did (you) fall?'
3 *MOT: bu shi la.
not be PRT
'(I) didn't.'
4 *MOT: gei na ge you tang-dao.
PSV that CL oil burn-arrive
'(I) was burned by (some) oil.'
5 *TIN: ganma hui you tang-dao?
how come AUX oil burn-arrive
'How come (you) were burned by the oil?'

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6 *MOT: jian yu ya.
fry fish PRT
'(I) was frying fish.'

In utterance 1, the mother commented on an immediate concern about her bleeding. In utterance 2, Tingting switched the time frame from the present to the past by asking her mother where she had fallen. Note that no temporal marker was used here. However, from our world knowledge we know that there is a causal relation between falling and bleeding, and falling precedes bleeding. Since the mother's bleeding was observed at the time of speech, her falling must have occurred before the time of speech. In addition, the inherent semantic aspect of the verb *diedao* ('to fall') also contributed to the interpretation of pastness. *Diedao* is a punctual verb. That is, the event of falling occurs instantaneously. Once it occurs, it ends. Therefore, in utterance 2, Tingting was talking about an event that she thought had happened and ended in the past. Therefore, although without an overt marker, the past reference of the utterance could be inferred.

The children sometimes, however, initiated implicit past references which were not related to the situational context. In these cases, the mothers' background knowledge played an important role in interpreting the temporal reference, as shown in Example 7.

Example 7

1 *WEI: da da # da mayi. ←
big big big ant
'Big, big, big ants.'
2 *MOT: da mayi a.
big ant PRT
'Big ants.'
3 *MOT: ni jintian zai apo jia kan-dao shenme chong?
you today at grandma house see-arrive what insect
'What insects did you see at Grandma's house today?'
4 *WEI: kan-dao da mifong ou.
see-arrive big bee PRT
'(I) saw big bees.'
5 *MOT: da mifong haiyou ne?
big bee also PRT
'Big bees and what else?'
6 *WEI: haiyou mayi.
also ant
'And also ants.'

In Example 7, Weiwei initiated a new topic and mentioned 'big ants' in an excited tone. No temporal reference was explicitly indicated. However, the mother could infer the temporal reference from the background knowledge

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she shared with Weiwei. Since there was not any ant or anything related to ants in the conversational context, it appeared that Weiwei was not referring to the here-and-now. As the mother knew about Weiwei's excitement when he saw some insects at his grandmother's place earlier that day, she then interpreted the temporal reference of the utterance as past time. The mother thus continued the conversation by supplying a temporal marker *jintian* ('today') and a locative marker *apo jia* ('grandma's place') in utterance 3. In other words, the shared background knowledge provided the resource for the mother to infer the implicit temporal reference and to carry on the conversation.

DISCUSSION

This study has shown two Chinese three-year-old children's capabilities and limitations in referring to the past. As seen in the analysis, the children were able to spontaneously participate in conversation about immediate past, but they relied heavily on maternal scaffolding to talk about earlier past. Thus, the children's ability to participate in conversation about earlier past had not yet fully developed. Immediate past events usually occur within children's immediate visual context, with the referents and the resultant state still present in the context. Thus, the immediate context provides a support for children's linguistic production. However, events of earlier past often do not involve the immediate context. Without the contextual support, referring to earlier past appears to be more difficult for children; it requires a variety of cognitive, linguistic and conversational skills which the children may not have acquired.

However, the analysis demonstrates that the mother's elicitation was rather effective in guiding the child to participate in conversation about earlier past. We may posit that in the absence of contextual support, the mother's elicitation functions as a discourse support for the child to participate in conversation involving more remote past. As pointed out by Eisenberg (1985), the reliance on the visible context for linguistic support is replaced by support from the discourse frame itself. With the mother's elicitation, the child often merely has to provide simple responses to participate in the conversation. In maternal scaffolding, the mother reduces the degree of freedom with which the child has to cope. As a result, the child can concentrate his/her attention into a manageable domain and interact with the mother in conversation (Bruner, 1983). The importance of adult guidance in child cognitive development has been pointed out by Vygotsky (1978) in his 'zone of proximal development', which he defines as the difference between what a child is able to do independently and what he/she can achieve under adult guidance. According to Vygotsky, a child develops his/her capabilities by participating in guided interactions in the zone of proximal development. Thus, it has been suggested that scaffolding may

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facilitate the child's acquisition of the appropriate form, content, and organization of temporal displaced speech (Lucariello & Nelson, 1987).

The findings also indicate that the two children mainly established deictic past reference, with the speech time as the reference time. They established deictic past reference by using the aspect markers *le* and *guo* and deictic temporal adverbs. It appears that referential temporal relations (e.g. the use of the referential adverb 'Sunday'), which require a self-determined external reference, are cognitively and linguistically more difficult. Erbaugh (1992) also noted that Chinese children at age 2;4 to 2;9 used almost exclusively deictic time adverbs. Since both children in this study were already three years old, they demonstrated the relatively early use of referential adverbs and adverbial clauses to establish referential temporal relations.

As shown in the results, the children used the perfective marker *le* predominantly with resultative verbs. Therefore, it appears that the children's use of the perfective marker was associated with the inherent semantic aspect of verbs. The findings are consistent with the results of Li's (1990) experimental study, which also demonstrates the association between the perfective marker *le* and resultative verbs. Erbaugh (1992) suggests that 'pastness of event' and 'clear end point' are the two most important contextual factors that are correlated with the occurrence of *le* perfective. The results of this study thus provide another piece of evidence for the strong association between the two factors and the use of *le* in child Mandarin. Although the perfective marker *le* is not a past marker, there is a strong association between the sense of perfectivity and the sense of pastness. Perfectivity usually focuses on the end point or the completion of a situation. When a speaker mentions a completed or ended situation, the situation often occurs before the time of speech. Therefore, when no other explicit markers are present to overrule such interpretation, the perfective marker *le* often contributes to the establishment of past reference. Shirai & Andersen (1995) argued for a prototype-based account for first language acquisition of tense-aspect morphology. This proposed account nicely explains the results we observe in this study. According to the prototype account, children acquire a linguistic category starting with the prototype of the category, and later expand its application to less prototypical cases. Therefore, when Chinese children acquire the perfective marker *le*, they also start with the prototype perfective. According to Andersen & Shirai (1994), the features of the prototype perfective include [+unitary], [+result state], [+punctual] and [+past], which also overlap with the prototype past. While the authors suggest that the convergence of the prototype past and the prototype perfective is the reason why early past marking is taken to be perfective marking in tensed languages, the convergence can also explain why in a tenseless language such as Mandarin, early perfective marking is strongly associated with the sense of pastness.

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Furthermore, the analysis has demonstrated how implicit temporal reference was inferred in the children's speech when no explicit temporal marker was supplied. It is observed that the mothers could infer the implicit temporal reference by resorting to semantic and discourse-pragmatic resources, such as inherent semantic aspect, situational contexts, and shared background knowledge. As suggested by Klein (1995), the functioning of temporality is always based on a subtle balance of what is explicitly expressed and what is left to be recovered through other contextual information. For future research, longitudinal studies are needed in order to further discover how the balance between explicit marking and implicit inferencing is reorganized in the developmental process of temporality.

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APPENDIX

Abbreviations in the examples:

AUX	Auxiliary
CL	Classifier
EXP	Experiential aspect
PFV	Perfective aspect
PRT	Particle
PSV	Passive
Q	Question marker
3sg	Third person singular

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