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摘 要

兒童透過敘事表達自己並與他人建立關係。成功的敘事表達除須具備豐富的語彙，並仰賴敘事者將陳述的故事情節，做局部及整體兩層次的關聯。本研究旨在探討漢語兒童對局部情節與整體故事主軸的連結處理能力，以一窺其敘事連貫能力之發展。

我們以 60 位來自中產階級家庭的漢語兒童，以及 30 位成人為對象；其中五歲兒童有 3 位，九歲兒童 30 位，男女各半。我們以 *Frog, where are you?* 為題材，來引發研究對象的敘事表達。統計分析以年齡、性別與故事段落為獨立變項，以故事情節連結的方式為依變項，探討變項間的互動關係。

研究結果顯示出年齡主效應，但性別因素未達顯著效果。我們發現五歲孩子於局部與整體連結兩方面均顯不足；成人則在兩方面均展現成熟的技巧。而九歲的整體連貫能力趨近於成人，然其局部情節的連結能力則未臻理想。

本研究之結果，讓我們針對漢語兒童其故事的局部與整體的連結能力發展有進一步認識，同時，亦為台灣的孩童在 *Frog story* 的敘事研究上，留下珍貴的漢語語料。

關鍵詞：敘事連貫、漢語兒童、青蛙故事、局部、整體

ABSTRACT

To elaborately interpret a narrative, a narrator needs to attend to both local and global aspects of the narrative. At the local level, the narrator must verbalize relevant components of a single event and should be able to infer the interrelatedness of a complex chain of events; at the global level, the narrator should attend to the gist of the narrative. The present work focuses on children's developmental progression in relating narrative events in terms of global and local structures.

Thirty Mandarin-speaking 5-year-olds, thirty 9-year-olds and thirty adults were included as subjects. The narrative data were elicited on the basis of *Frog, where are you?* Three core components of the story were considered as criteria to assess subjects' ability in maintaining global coherence; one complex and one chain of events were chosen to examine subjects' ability in interpreting local chains of events.

Age main effect is yielded through our analysis, but no gender effect is detected. Our 5-year-olds are inadequate in maintaining coherence in both global and local levels. The 9-year-olds, however, are more advanced in enhancing global coherence, yet, perform below chance level for local coherence. Nearly two-thirds of them can coherently present gist of the story but only one-third of them can appropriately interpret events at the local level. The adults, as the standard of comparison, can maintain narrative coherence at both levels; they not only successfully interpret the overarching thematic structure but also provide appropriate connections between events.

Berman and Slobin's four-phased developmental framework, Karmiloff-Smith's three-phased model, and related explanations in cognitive psychology are considered in our discussion. The outcome of this work not only advances our understanding of children's ability in maintaining narrative coherence, but also unveils the complex of linguistic and cognitive capacities that underlie children's narrative ability.

Keyword: Mandarin-speaking children, narrative coherence, frog story, local, global

1. INTRODUCTION

Children express themselves and build up connections with others through narratives which consist of not only individual events but also a network of associated events. The proper cognitive and linguistic abilities are required to make a successful interpretation of the interconnections among events. Hence, an investigation of how young children relate narrative events may lead us to explore the nature of the relationship between language and cognition.

When thinking about narrative development, we concern with the ways in which children describe situations, and, in particular, with the development of children's capacity to relate individual events to each other, for which is crucial for the production of an elaborate narrative. Much recent research in this area has focused on data collected from children's renderings of the content of the story book *Frog, where are you?* by Mercer Mayer (1969). The book allows for different interpretations of events in the story and is a very reliable tool for tapping children's budding narrative abilities (Bamberg and Marchman 1994, Berman and Slobin 1994, Trabasso and Rodkin 1994). Thus, an analysis of the frog stories produced by narrators of different ages and from different languages may further our understanding of the abilities needed to capture and relate events in words.

Among various research based on the frog story, Berman and Slobin's (1994) decade-long project merits special attention for which conducted not only cross-sectional but also cross-linguistic analyses. Regarding cross-sectional analyses, this work included subjects of 3-year-olds, 5-year-olds, 9-year-olds, and adults. In terms of cross-linguistic analyses, the study compared narratives in English, German, Spanish, Hebrew, and Turkish. Berman and Slobin detected that the 3-year-olds already have the ability to make inferences about what is not overtly represented in the pictures in the story; that is, the 3-year-olds begin to treat the pictures in the story as events rather than just as a list of items. However, the ability to make inferences is not sufficient to provide a mature interpretation of a story. To this end, young children still need to process local and global information to provide links between the events in a story and thus to achieve thematic coherence in terms of the network of local situation and of the global story plotline.

The distinction between abilities for local and global processing can be found in the research of various cognitive domains, ranging from visual perception, drawing to autism (Brosnan et al. 2004, Karmiloff-Smith 1990, 1992, Mottron 2000, Navon 1977, Picard and Vinter 2006, Porporino et al. 2004, Spensley and Taylor 1999, Thomas and Forde 2006, Trick and Enns 1997). A similar distinction also applies to narrative ability. To elaborately interpret a story, a narrator needs to attend to both local and global aspects of the story. At the local level, the narrator must verbalize relevant components of a single event and should be able to infer the interrelatedness of a complex chain of events; at the global level, the narrator

should attend to the overall, hierarchical structure of the story plotline. In Berman and Slobin's (1994) work, they noted an age-related increase in explicit reference to the global story plotline. In particular, the proportion of the 9-year-olds whose texts manifest global narrative structure is nearly twice as that of the 5-year-olds. Regarding the local structure, only 10% of their 5-year-olds appropriately interpret locally connected events, and nearly 50% of the 9-year-olds fail to make connections among these events. They thus concluded that the 5-year-olds generally had difficulty in making causal connections between the events in the story. As Berman and Slobin (1994) explain, due to the advance in cognitive ability for making inferences about situations that are not overtly represented in pictures, the 5-year-olds begin to consider individual pictures as dynamic events; however, they can not embed individual events within a network of associated circumstances.¹ Their stories, therefore, tend to be inadequate at both global and local levels.

In the investigation of the changing functions of frames of mind (FOM) expressions² in children's narratives based on the frog story, researchers suggest a local-to-global distinction in preschoolers' use of such expressions. According to Bamberg and Damrad-Frye (1991), differentiation is made between a locally-triggered FOM expression and a globally-triggered one. The former refers to an expression motivated by an immediate situation in individual pictures, while the latter type is triggered by the overall story plotline. Bamberg and Damrad-Frye (1991) noted that all of their 5-year-olds' FOM references were motivated by the facial expressions which were in agreement with the immediately precipitating event, i.e., the local condition. For 9-year-olds, however, the importance of such facial expressions declined; instead, the overall story plotline becomes a better predictor for FOM expressions. Accordingly, with increasing age, children seemed to be able to use FOM expressions more flexibly and rely more on the global plotline, i.e., the hierarchical relationships among the events in a story.

Regarding the ways in which Mandarin-speaking preschoolers use FOM expressions, Sah's study (2006) provided significant data regarding the interaction between narrative focus and use of FOM expressions. She stated that nearly all the 5-year-olds and most of the 9-year-olds employ locally motivated FOM expressions, while all adult subjects tend to use globally triggered ones. Accordingly, the use of FOM expressions not only discloses narrators' evaluative stance on the reported actions but also unveils narrators' knowledge of the overall structure. This study also noted that the focus in the narratives of the subject children changed from a static picture-description to a dynamic event-narration. To be more specific, at the beginning of the fifth year, some of her preschool subjects merely interpreted the contents of the story picture as a list of static objects, while, at the end of their fifth year, all of the subject children conceived of the pictures as events, in terms of being predications

¹ Similarly, Nelson and Gruendel's (1986) claimed that children around age 5 may generate individual events well; yet, they still have difficulties in producing complete episodes in fictional narratives, especially complicated episodes.

² FOM expressions consist of references to emotional states, mental states or activities, which is crucial for a good narrative.

of activities or happenings. Though the study demonstrated that the 5-year-olds tended to interpret story pictures as events, it did not further analyze how the young children related the events in the story and thus unable to provide information on the developmental path for the way in which Mandarin-speaking children relate story events.

The above mentioned studies underline the distinction between the abilities for local and global processes. More interestingly, the work on narrative development not only demonstrates the dissociation between local and global processing but also delineates the preference of children at different ages. That is, there are different developmental paths for children's abilities in interpreting locally-connected events and globally-motivated story plotline. In Sah's (2007) longitudinal work on Mandarin-speaking children's narrative development, she focused on children's ability in interpreting locally-connected events. The results support Nelson and Gruendel's (1986) observation that children around age 5 can generate individual events well; yet, they still have difficulties in producing complete episodes in fictional narratives, especially the complicated episodes. In other words, most preschoolers fail to address the connection between events. The data inform us that the ability for relating events in narratives unfolds gradually and that narrator's progression from treating only one event to related event complex, implicitly or explicitly, requires linguistic as well as cognitive capacities. Due to the limited scope, however, Sah's research followed children's narrative development for merely about seven months which was not sufficient to yield any significant developmental change. Furthermore, her study only addressed the way in which young children interpret locally-connected events but failed to discuss the global aspect of event connection.

To verify earlier findings on children's ability in processing locally-driven and globally-driven story structure, the present study provided data from a different language, i.e., Mandarin Chinese. Also, to confirm and amend Sah's (2007) findings about Mandarin-speaking children's ability in relating locally-connected events in a story, our work bases on a cross-sectional protocol. To make an appropriate link between the events in the story, a narrator needs to provide a causal connection between them.³ Hence, the present work is not only able to show the developmental progression in children's relating events in the story but also assess their ability to provide causal links between the events.

There are two research questions addressed by the present work:

- (1) Is there any difference in Mandarin-speaking 5-year-olds' and 9-year-olds' ability in interpreting overall story structure?
- (2) Do 5-year-olds and 9-year-olds tend to interpret a sequence of locally-connected events differently?

³ The causal connection here encodes local causality for the event sequence, while the causal structure relates to the overall goal of the story plotline, i.e., searching for the missing frog, is at the global level. In the present work, we focused on the causal connection at the local level of the story organization.

2. METHOD

2.1 Subject

Earlier studies showed that 5-year-olds and 9-year-olds display different abilities in constructing and connecting events in the story and in using FOM expressions (Bamberg and Damrad-Frye 1991, Berman and Slobin 1994, Sah 2006, 2007).⁴ Such difference in narrative ability gains support from research in developmental psychology. Among the prominent studies, Piaget's framework of cognitive development clearly state that 5-year-olds and 9-year-olds belong to different developmental stages, i.e., the former belong to the pre-operational phase, while the latter, operational stage. To further assess the narrative abilities of children of these two age groups and to make the comparisons with finding from earlier work viable, we also consider 5-year-olds and 9-year-olds as our subjects.

Sixty Mandarin-speaking children, thirty 5-year-olds and thirty 9-year-olds, and thirty adults participated in the present study. All subjects were from similar middle-class socio-economic backgrounds. All the children were normally developing children, with no learning disabilities, or speech or hearing problems.

2.2 Material

To control the content of the fictional narratives, we used a story book, containing 24 pictures, entitled *Frog, where are you ?* (Mayer 1969) as the material to elicit fictional narratives from subjects. This book was chosen not only because it has become a worldwide research tool which renders the cross-linguistic comparisons possible, but also because it is wordless and its structure has been extensively analyzed (Bamberg 1987, Bamberg and Marchman 1990).

The frog story is a typical children's story with a hero, a problem, a series of actions following the problem, and a happy ending. In addition, its content and context are age-appropriate to preschoolers. The book is suitable to our research goals since it depicts an elaborate series of events which allow the narrator to provide various links among events and to take different perspectives on events.

⁴ We decide to include 5-year-olds as our youngest group, since we assume Earlier studies have shown that preschoolers display a considerable growth in narrative skills from age 2 to 6 (Bamberg 1987, Chang 1998, 2000, Minami 1996, Peterson and McCabe 1983). Based on the developmental data from a variety of languages, investigators indicated that 5- and 6-year-olds can already produce well-ordered narratives (Bamberg and Damrad-Frye 1991, Minami 1996, Peterson and McCabe 1983). Peterson and McCabe (1983), in a study of 1124 personal narratives of children, found that, by 6 years of age, most children are able to produce well-organized stories. Thus, we included 5-year-olds as our youngest group with the assumption that they may begin to display ability in relating events in a story.

2.3 Data Collection

Rapport was first established in the observation periods. The interviews were carried out individually with each subject, and consisted of an initial warm-up conversation followed by a narrative task, which is based the wordless book, *Frog, where are you*. The subjects were first asked to look through the entire book and then asked to tell a story while looking at the pictures. The entire interviews were audio-taped and subsequently transcribed.

2.4 Data Analysis

In order to verify the accuracy of the transcription, nine transcripts were randomly selected and were fully transcribed and coded by another native Mandarin Chinese speaker. Cohen's kappa statistics were used to assess inter-rater reliability. The inter-rater agreement result was 90%.

After the transcriptions were done, qualitative analyses were performed to assess the ways in which the subjects interpreted the events in the story. Our analyses were twofold: global as well as local structure of the story. Regarding the global structure, we consider three components are crucial for interpreting contents of the story as a whole (Labov and Waletzky 1967, Shen 1988, Berman and Slobin 1994). The three components are: the initiating goal, the unfolding part, and the outcome. To make viable the comparison with earlier findings, we adopted Berman and Slobin's (1994) criteria to score the narrative production:

- (1) The initiating goal is considered if the narrator explicitly mentions the boy protagonist's noticing that the frog is missing.
- (2) The unfolding part is scored for explicit mention of searching or calling for the frog.
- (3) The outcome is considered is if the frog the boy takes home is explicitly described as the same or as the substitute for the lost pet frog.

Due to the limited scope of the present work, our analyses for the locally-connected events focused on Picture 3, Picture 14 and 15 of the frog story; the former is a complex event and the latter perhaps presents the most difficult challenge, both conceptually and linguistically. To successfully elaborate Picture 3, a narrator needs to include five components:

1. change of state event (the boy has woken up)
2. temporal location (in the morning, the next morning)
3. inferencing that the protagonist learns something (the boy sees, discovers, realizes): the plot-advancing elements
4. the state of affairs which is depicted (the jar is empty) or inferred (frog has gotten

lost, disappeared, run away)

5. the protagonist's response – either subsequent action (get out of bed to look for the frog) or affective reaction (feeling surprised, concerned, curious): attendant circumstances or motivation.

As for Pictures 14 and 15, they present a complex chain of events. Picture 14 functions as the background event for what happens in this sequence of events. To begin with, Picture 14 shows the boy-protagonist climbing up on a rock to call for his frog. While the boy is on the rock, he grabs something which he believes are the branches of a tree. In Pictures 15, the branches turn out to be a deer's antlers. Thus, these two pictures involve a misconception on the boy-protagonist's part and the consequence that results.⁵ Given the nature of the interrelatedness in this sequence of events, the narrator is required to provide causal links between the two events by pointing out the misconception of the boy-protagonist in order to show competent verbalization.

Based on the results of Berman and Slobin's (1994) work and the earlier work on Mandarin-speaking children (Sah 2007), the present study adopted Berman and Slobin's classification, with minor modifications, to render the cross-linguistic comparisons viable. Accordingly, subjects' interpretation of these two pictures may fall into one of four categories: (1) one event; (2) two unrelated events; (3) related events, with the boy's misconception implied; (4) related events, with the boy's misconception explicitly mentioned. Causal connection was considered provided if the boy's misconception was addressed explicitly or implicitly.

3. RESULTS AND DISCUSSION

3.1 Global Structure

Figure 1 displays an age-related increase in percentage of explicit reference to the cardinal elements of the plotline. To be more specific, less than one-third of the 5-year-olds explicitly mention these main elements in the story, over sixty percent of the 9-year-olds explicitly refer to these components, while the adults demonstrate the ceiling effect for the first two components.

⁵ Picture 15 also works as the precursor of Pictures 16 and 17 which reveal the consequences of the boy's misconception: the deer runs to a cliff with the boy; the dog runs alongside and barks at the deer; the deer throws the boy off the edge of the cliff and the dog also falls off. In other words, the boy's unintentional act in the initial event of Picture 15 leads to a series of consequences later in Pictures 16 and 17. The inter-connection among these three pictures, though very intriguing, is beyond the scope of the present work. To better focus our discussion, we analyzed only Pictures 14 and 15.

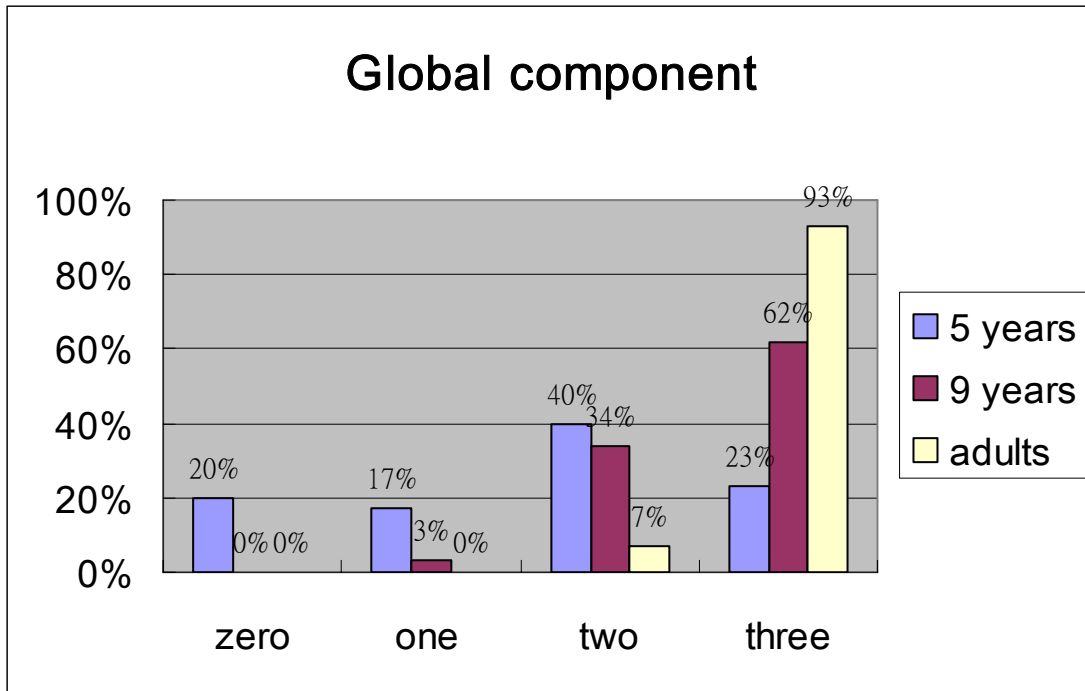


Fig 1. Explicit References to Global Story Components, by Component

Table 1 shows an increase in difficulty for each of the three core components. Subjects across all age groups can appropriately interpret the first core component of the story. For Component II, the 9-year-olds and adults can still successfully present the connection; only half of the 5-year-olds, however, can achieve this. Among the three components, the third component is the most challenging one for all three groups of subjects. Moreover, age difference is clearly shown in subjects' interpretation of this component. 90% of the adults and 50% of the 9-year-olds can explicitly mention this component is their narrative production, while less than 30% of the 5-year-olds can achieve this.

	5-year-old (N=30)	9-year-old (N=30)	Adult (N=30)
Component I	20	27	30
Component II	15	29	30
Component III	15	19	28

Table 1: Distribution of explicit reference to three story components by different subject group

3.2 Local Structure

As mentioned earlier, to elaborately interpret a story, a narrator needs to attend to not only the overall, hierarchical structure of the story plotline but also the local aspect of the story. At the local level, the narrator must verbalize relevant components of a single event and should be able to infer the interrelatedness of a complex chain of events.

Berman and Slobin (1994) considered Pictures 14 and 15 in the frog story to be the most complex network of events in the frog story, for even 9-year-olds may not display fully mature abilities in interpreting this sequence of events. According to them, a proficient narrator can be expected to treat the scenes in Pictures 14 and 15 as related events. Hence, a child providing a mature interpretation of these events should explain the causal connections between them by pointing out the boy's misconception.

Figure 2 demonstrates the four different ways in which our subjects interpreted the events in Pictures 14 and 15 across three age groups. Merely 10% of the 5-year-olds can successfully relate these two pictures by pointing to the boy's misconception. Though the 9-year-olds did better than the younger group, there is only 21% of them can successfully elaborate the series of events. Compared with children, adults perform exceedingly well. There are over two-thirds of the adults relate these two pictures successfully.

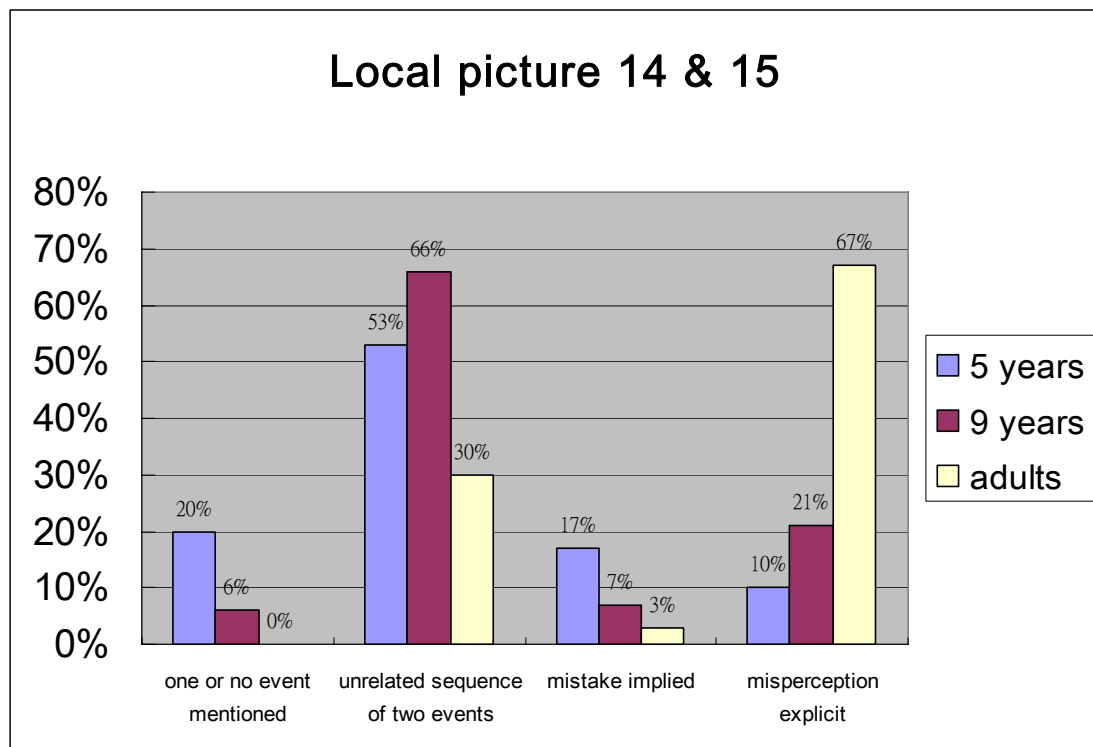


Fig. 2. Relation between Two Events in Pictures 14 and 15, by Relation

Each case is illustrated by one specific excerpt given below. To begin with, in Excerpt 1, the child, CRS, mentioned only one event in which he showed that he, CRS, was trying to make sure whether the animal in the picture was a lamb, a deer, or a moose: 又有一隻羊... 那是什麼鹿呀? 那個是梅花鹿啊...麋鹿哦麋鹿 ‘There is a sheep... What kind of deer is it? That is a spotted deer.... Moose! Oh, a moose’.

Excerpt 1: CRS

然後呢 - 又有一隻羊 - 又有一隻 - 那個 那個 - 那是什麼鹿呀 - 那個是梅花鹿啊 - 不是在下雪的那邊有的 - 麋鹿 - 哦 麋鹿

ran2hou4 ne1 – you4 you3 yi4 zhi1 yang2 – you4 you3 yi4 zhi1 – na4ge na4ge – na4shi4 she2mo lu4 ya1 – na4ge shi4 mei2hua1lu4 a1 – bu2shi4 zai4 xia4xue3 de na4bian1 you3de – mi2lu4 – o2 mi2lu4

And then... there is a sheep... another one. that. that. What kind of deer is that? That is a spotted deer. It does not belong in the snow. Moose! Oh, a moose.

In Excerpt 2, LCF made an implicit connection between the two events by saying 他抓住一枝樹枝是一隻麋鹿 ‘He grabs onto a tree branch and it is a reindeer’. However, while LCF included the transition from tree branches to antlers in their narration, at the same time she failed to present the transition in a more explicit way, i.e., by pointing out that the boy grabbed the antlers as a consequence of his misconception of what was in front of him.

Excerpt 2: LCF

他抓住一枝樹枝是一隻麋鹿 - 然後呢他就說說說:「小蛙你在哪裡啊?」 - 然後呢 - 嗯小鹿就那隻麋鹿就把小男孩這樣叨起來 - 然後呢那隻那個小男孩就說那個小文就說說:「你叫什麼名字?」 - 「我叫小鹿」 - 然後呢「你有沒有看到我的青蛙?」 - 「沒有可是我知道有很多青蛙的地方喔。」 - 然後呢小男孩就騎在那個麋鹿的背上

ta1 zhua1zhu4 yi4 zhi1 shu4zhi1 shi4 yi4 zhi1 mi2lu4 – ran2hou4 ne ta1 jiu4 shuo1 shuo1 shuo1 :「xiao3wa1 ni3 zai4 na3li3 a1 ?」 - ran2hou4 ne1-en1 xiao3 lu4 jiu4 na4zhi1mi2lu4 jiu4 ba3 xiao3 nan2hai2 zhe4yang4 diao1 qi3lai2 – ran2hou4 ne1 na4zhi1 na4 ge xiao3 nan2hai2 jiu4 shuo1 na4 ge xiao3wen2 jiu4 shou1 shou1 :「ni3 jiao4 she2mo ming2zi4 ?」 -

「wo3 jiao4 xiao3lu4」- ran2hou4 ne1 「ni3 you3 mei2you3 kan4dao4 wo3de qing1wa1 ?」 - 「mei2you3 ke3shi4 wo3 zhi1dao4 you3 hen3 duo1 qing1wa1 de di4fang1 o1」- ran2hou4 ne1 xiao3 nan1hai1 jiu4 qi2 zai4 na4ge mi1lu4 de bei4 shang4

He grabs onto a tree branch and it is a reindeer. And then he asks, asks, asks, “Little frog, where are you?” And then the deer which turns out to be a moose picks up the boy with its mouth. And then the little boy says that, Little Wen asks, asks “What is your name?” “My name is Little Deer.” And then “Have you seen my frog?” “No, but I know a place with a lot of frogs.” And then the little boy rides on the back of the moose.

The distinction between two distinct events and two related events is exemplified by Excerpts 3 and 4. In Excerpt 3, TYH related the two events in a straightforward temporal contiguity: 然後就爬到樹上...然後他就扶在鹿的角 ‘Then he climbs to the top of the tree... And then he is holding onto the deer’s horn’. This way of linking one event to the next by using *then*, *and*, and *then* is typical of most 5-year-olds across languages (Berman 1988). Shen (1990) further identified such a way to connect events as ‘local temporal’. In Excerpt 4, YEC, a 9-year-old seems to be conceptually and linguistically better equipped, so she started to provide causal links between the events by explicitly referring to the boy’s mistake in the nature of the object before him: 他以為那根是樹枝 - 就扶著那個東西 - 結果是一個一隻鹿 ‘he thinks that it is a branch so that he holds on to it. Yet, it turns out to be a deer’.

Excerpt 3: TYH

然後就爬到樹上-狗就在下面趴-然後他就扶在鹿的角-鹿-然後那個鹿就起來-然後把那個人撞到牠的眼睛上面

ran2hou4 jiu4 pa2dao4 shu4 shang4 -gou3 jiu4 zai4 xia4mian4 pa1 - ran2hou4 ta1 jiu4 fu2zai4 lu4 de jiao3 - lu4 -ran2hou4 na4ge lu4 jiu4 qi3lai2 - ran2hou4 ba3 na4ge ren2 zhuang4dao4 ta1de yan3jing1 shang4mian4

Then he climbs to the top of the tree. The dog is crawling around the bottom there. And then he holds onto the deer’s horn. The deer. And then the deer stands up. And then it hits the person on its eyes.

Excerpt 4: YEC

他躲牠他.他爬到小山丘上 - 發現了一個東西 - 他以為那根是樹枝就扶著那個東西 - 結果是一個一隻鹿

ta1 to3 ta1 ta1 ta1 pa2tao4 hsiao3 shan1chiu1 shang4 - fa1hsien4 le ilko tung1hsi1 – ta1 i3wei2 na4ken1 shih4 shu4chih1 chiu4 fu2che na4ko tung1hsi1 – chieh2kuo3 shih4 ilko ilchih lu4

He hides. He climbs a little hill and finds something. He thinks that it is a branch so that he holds on to that thing. Yet, it turns out to be a deer.

In Excerpt 4, the 9-year-old boy makes explicit mention of the protagonist's misconception by using the FOM term 'think' 以為 to provide transition. Excerpt 5, from an adult, provides another example for making explicit connection of events.

Excerpt 5: LCJ

他爬到樹 - 爬到石頭的頂端 - 抓著樹枝 - 然後大喊著小青蛙 - 卻在這個時候樹枝動了起來 - 他才發現那是一隻鹿

ta1 pa2 tao4 shu4 - pa2 tao4 shih2tou2 te ting3tuan1 – chua1 che shu4chih1 – jan2hou4 ta4 han3 che hsiao3 ching1wa1 – chueh4 tsai4 che4 ko shih2hou4 shu4chih1 tung4 le chi3lai2 – ta1 tsai2 fa1hsien4 na4 shih4 il chih1 lu4

He climbs the tree. (He) climbs to the top of the stone. He holds the tree branch. Then he calls for the little frog. But then the branch starts moving. He then realizes that it is a deer.

Taken together, the results lead us to speculate that the inference of the causal connection is beyond the capacities of the 5-year-olds in this study. Also, as Berman and Slobin (1994: 56) noted, mature rendering of this sequence of events requires “backtracking” in on-line linguistic production and also perceptual and conceptual processing.⁶ In other words, to successfully interpret this sequence of events, narrators need to be equipped with capacities at three levels: the prepackaging information of in on-line linguistic processing, perceptual attentiveness, and conceptual awareness. Having more advanced backtracking abilities, the adults perform a lot better than both groups of children, and the 9-year-olds also outperform the 5-year-olds in presenting appropriate links between events in the story.

The data in Excerpt 6 form another interesting contrast with that in Excerpt 7. As mentioned above, TY in Excerpt 6 made an explicit connection between Pictures 16 and 17 by referring to the boy-protagonist's misconception. Although TY yielded a proper rendering of

⁶ The hesitations and pauses detected by Berman and Slobin (1994) provide evidence for the narrator's on-line linguistic backtracking as he or she tries to link the two events.

the two events by encoding local causality, his text was highly condensed and contained impoverished linguistic and descriptive details. Excerpt 7, in contrast, failed to establish a causal connection between the two events, but manifested a richness of linguistic expressions which involved interpretative comments and an elaborate evaluative flavor: 他爬上去找也找不到...那個小男孩呢好像要被抓走一樣喔 ‘The boy climbs to the top but can not find it... That little boy looks as if he is being taken away’. The contrast between Excerpts 6 and 7 leads us to speculate a possible dissociation in the ability to provide linguistic expressions and that for inferring relations between events.

Excerpt 6: TY

小朋友就爬到那個石頭上 - 抓著鹿的角 - 以為是樹根 - 然後鹿把小朋友的屁股網到頭上面啦 - 腳在那個 - 手跟腳 - 手跟頭都在鹿的後面

xiao3 peng2you3 jiu4 pa1dao4 na4ge shi2tou2 shang4 – zhua1zhe lu4 de jiao3 – yi3wei2 shi4 shu4gen1 – ran2hou4 lu4 ba3 xiao3 peng2you3 de pi4gu3 wang3dao4 tou2 shang4mian4 la – jiao3 zai4 na4ge – shou3 gen1 jiao3 – shou3 gen1 tou2 dou1 zai4 lu4 de hou4mian4

The kid climbs onto that rock and grabs the deer’s horn. He thinks that it is a branch. And then the deer gets the kid’s butt over its head. The leg is at that. The hand and the leg. The head and the hands are both behind the deer.

Excerpt 7: LTC

小男孩他爬上去找也找不到 - 突然呢旁邊有一個貓頭鷹 - 然後呢看到了一個馴鹿 - 馴鹿呢就揹著一個小男孩 - 那個小男孩呢好像要被抓走一樣喔

xiao3 nan2hai2 ta1 pa2 shang4qu4 zhao3 ye3 zhao3 bu2 dao4 – tu2ran2 ne1 pang2bian1 you3 yi2 ge4 mao1tou2ying1 – ran2hou4 ne1 kan4dao4 le yi2ge xun2lu4 – xun2lu4 ne1 jiu4 bei1 zhe yi2ge xiao3 nan2hai2 – na4ge xiao3 nan2hai2 ne1 hao3xiang4 yao4 bei4 zhua1 zou3 yi2yang4 o1

The little boy climbs to the top but can not find it. Suddenly there is an owl nearby. And then he sees a reindeer. The reindeer carries a little boy. That little boy looks as if he is being taken away.

The content of Excerpts 6 and 7 not only display the above-mentioned dissociation, but also imply that children's development in relating narrative events may be treated as a problem-solving process, as proposed by Karmiloff-Smith (1984). Through inspecting the development of a variety of cognitive abilities, including the use of principles in physics, the drawing of spatial circuits, the use of cohesive devices for storytelling and the reading of maps, Karmiloff-Smith (1984) proposed a Three Phase Model for children's problem-solving, which she believed might apply to many domains.⁷ In this process-oriented theoretical model, narrative development is regarded as a problem-solving process.

The first phase of the Three Phase Model is the "procedural phase," which is characterized as an external data-driven process. The generated representations at this phase are independently stored. The second phase is termed the "metaprocedural phase." The linguistic or behavioral output at this phase is predominantly the product of top-down control. Since the overall organization may dominate the generated representations, the output of Phase 2 tends to be less elaborate in detail. Also due to the precedence of overall organization, the previously isolated procedures may be integrated into a single representational framework. The third phase is called the "conceptual phase," in which neither the data-driven nor the top-down process predominates. At this phase, children are in control of both the external data and the internal representation, and there is a balance in the interaction between data-driven and top-down processes.

As the Three Phase Model predicts, the development of top-down organization may sometimes be at the expense of the bottom-up descriptive details and lexical richness. Such reasoning is exemplified by Excerpt 6, in which the boy, TY, was motivated by the top-down organization so he focused on links between events yet provided only impoverished descriptive details. In contrast, in Excerpt 7, LTC focused on data in the immediate situation by providing rich interpretative and evaluative comments but failed to elaborate connection for the sequence of events. In terms of Karmiloff-Smith's model, these two 5-year-olds, at Time 3, worked at different phases while trying to interpret this sequence of events. For instance, TY had already entered Phase 2, while LTC and most other children were still at Phase 1. Nevertheless, neither LTC nor TY can be regarded as a proficient storyteller, for, to tell a story successfully, the speaker must integrate the connection of events and linguistic production. In other words, to present a mature narrative, the narrator needs to create a balance in the interaction between the top-down, organization-driven process with the bottom-up, detail-driven process, which is the result of Phase 3.

To sum up, our data inform us that the ability to relate events in narratives unfolds gradually. Our subjects link the global story plotline better than elaborate the local connection.

⁷ Karmiloff-Smith (1983, 1984) made distinctions between developmental *stage* and *phase*. The former is attached to particular age ranges; the latter, however, is not age-related. In addition, phases are recurrent across different aspects of a domain.

Regarding the local event, age effect does display. In particular, for the complex chain of events in Pictures 14 and 15, the narrator's progression in treating a sequence of events first as unrelated events then as related ones requires proper linguistic and cognitive capacities. On the one hand, we noted that most of our 5-year-olds and 9-year-olds could not appropriately link the sequence of events and thus tended to treat the events as single, unrelated ones. On the other hand, most adults provide causal links, implicitly or explicitly, for this sequence of events. However, though an advanced ability in making causal inferences fosters a successful interpretation of the interconnections among the network of events, rich linguistic expressions are also required to encode the situation. In the present work, we detected dissociation between the ability for making causal links and that for producing linguistic expressions. Such dissociation is explicable in terms of Karmiloff-Smith's problem-solving model, which suggests that children of the same age may work at different problem-solving phases and implies that there may be a trade-off between top-down coherence-motivated organization and bottom-up detail-oriented linguistic expressions during children's narrative development.

4. CONCLUSION

Narrative activities have long been of interest to psycholinguists, as they provide rich information about children's language as well as cognitive development. To elaborate a story, children need to infer about what is not visible in the printed pages, ranging from interpreting the inner states of mind of the characters in the story to making connections between events. In the present work, our children have better control over the global structure of the story than the local structure. Nearly one-third of the 5-year-olds and over 60% of the 9-year-olds can refer to the global plotline. For the local structure, however, merely 10% of the 5-year-olds and less than one-third of the 9-year-olds can coherently interpret the events. Our data suggests a developmental progression in interpreting the target sequence of events, first as unrelated events and then as related ones.

The rarity of reference to a connection between events in our data may be attributed to the precedence of an individual event over a sequence of events at this developmental period. According to Piaget (1962, 1969), children between ages 4 and 7 may be considered to be at an intuitive period.⁸ During this period, young children's understanding of objects or events mainly relies on the most salient perceptual feature of the target things, rather than on logical or rational thinking processes. The 9-year-olds' reasoning, however, belong to a different developmental stage, i.e., the concrete operational stage. Accordingly, they may perform better in providing logical or coherent links for story event(s). Such reasoning helps to explain why children of different ages tend to have different preference in relating events in the story.

⁸ The mean age of our preschoolers was 5;5 months at the first session of data collection and 5;11 months at the last session. Thus, they belong to the intuitive period.

In addition, as Berman and Slobin (1994) pointed out, in order to elaborate a network of events, a narrator should be equipped with complex backtracking abilities at perceptual, conceptual and on-line verbal production, which are beyond the capacities of the 5-year-olds. Such backtracking capacities take time to develop and thus our 5-year-olds were not able to master them well, while the 9-year-olds demonstrate marginally better skills in this aspect. Similarly, Hedberg and Fink (1985) and Roth and Spekman (1986) claimed that the ability to provide an elaborate interpretation of a complex chain of events might not fully unfold before children reach age 10.

Another plausible reason for the lack of causal connection in our data may lie in the 5-year-olds' limitations in theory of mind and linguistic encoding ability.⁹ Cognitively, the target sequence of events requires making a differentiation between the narrator's omniscient perspective and the boy's lack of knowledge about the situation. The ability to make such a distinction demands the work of theory of mind to make shifts between different stances. Linguistically, the narrator needs to encode each of the different stances involved (Berman and Slobin 1994, Chafe 1994). Our 5-year-olds seemed not to be well-equipped with abilities in these two aspects, and, therefore, most of them failed to interpret the causal connection clearly.

On inspecting the data, we note that cognitive and linguistic abilities may be dissociable in developmental paces. In particular, our data suggest dissociation between the ability to provide descriptive details and that for inferring causal relations between events.¹⁰ In terms of Karmiloff-Smith's (1984) model for problem-solving, most of our 5-year-olds were working at Phase 1, while the 9-year-olds evolved to work at Phase 2. In addition, there seemed to be a trade-off between top-down organization and the bottom-up descriptive details in the narratives produced by children. However, a narrator needs to enter Phase 3, as shown by adults, to integrate the top-down coherence-motivated organization with the bottom-up, data-driven descriptive details in order to present a mature narrative for this sequence of events.

With these analyses we hope that we have pointed out the nature of developmental progression in narrative coherence from children's story. Though this study unveiled the developmental progression in Mandarin-speaking children's interpretation of a sequence of events and the dissociation in abilities necessary to provide descriptive details and to infer relations between events, care should be taken when we try to generalize our findings to all children. The findings obtained here ought to be amended or augmented by studies using a larger amount of subjects, from which more credence will be gained.

⁹ Theory of mind refers to the realization that just as I have feelings, desires and beliefs so do other people. Researchers point out that children's knowledge about theory of mind takes several years to develop (Astington 1990, Chandler and Sokol 1999).

¹⁰ The ability for providing descriptive details is the linguistic capacity; the one for inferring connection between events is the cognitive capacity.

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6. SELF-EVALUATION OF THE PROJECT

The present work examines the development of Mandarin-speaking preschoolers' global- and local-connection in narratives. This study is significant for providing narrative data based on the frog story, the worldwide research tool. In the pool of samples from nearly 50 languages, our work contributes valuable data from Mandarin-speaking children in Taiwan. Hence, findings based on this study will be written out and submitted as journal paper.

Great care has been taken to minimize the potential flaws in the present work; there remain, nevertheless, several limitations. To begin with, our sample size is not large enough, and hence we yield only limited amount of information regarding the research topic. The second limitation is that our children are selected from a middle-class community. Actually, children from different socioeconomic conditions may experience different set of social interaction and related narrative genre practice (Michaels 1981). To better understand children's ability in achieving narrative coherence, future research should include a larger number of subjects of varied socioeconomic backgrounds.

行政院國家科學委員會補助國內專家學者出席國際學術會議報告

報告人姓名	薩文蕙	服務機構 及職稱	政治大學英語系副教授
會議時間	2009年6月10日至6月12日	會議地點	瑞典斯德哥爾摩
會議 名稱	(中文) 瑞典語言與認知學會第二屆學術研討會 (英文) The Second Conference of the Swedish Association for Language and Cognition		
發表 論文 題目	(中文) 由 Frog Story 看漢語兒童敘事連貫的表現 (英文) Narrative Coherence in Mandarin-speaking Children: Evidence from the Frog Story		
<p>筆者此次參加「瑞典語言與認知學會」所舉辦的國際學術研討會。會議自6月10日至6月12日，分三天進行。會議地點設於瑞典首府斯德哥爾摩的Stockholms University。會議以心理語言學為主要範疇，與會學者來自世界各地，實為心理語言學界一大盛事，亦讓筆者領受許多啟發。</p> <p>本屆學術研討會的會議涵蓋：語言習得、語言演化、心理語言學各研究取向、語言類型，並探討語言習得、語言結構、語言類型與認知間的關係。此外，大會精心規劃四場專題討論(theme session)，聚焦於「語言與視覺的界面」、「認知與第二語言的使用」、「語言、知覺與符號」以及「語言與外在世界」等不同面向，並請到許多重量級學者發表專題演說，如Stanford大學的Elizabeth Traugott，Max Planck研究所的Daniel Casasanto，斯德哥爾摩大學的Maria Koptjevskaja Tamm，以及Niclas Abrahamsson。筆者有幸於此次會議目睹到大師級人物的風采，大師們藉由深入簡出的演說，傳達出其研究心得與精闢見解，讓在研究路上摸索的筆者，領受到許多啟發與鼓舞。</p> <p>本屆大會針對心理語言學各領域，提供與會學者一相互交流切磋的機會，不僅讓來自世界各地的專家可交換研究心得，並藉此推動整體心理語言學界的前進。筆者認為國內可借鏡「瑞典語言與認知學會」的作法，廣邀心理語言學各相關領域的學者，進行跨領域的切磋，以交換研究心得，促進整個學門之發展。</p>			

Narrative Coherence in Mandarin-speaking Children: Evidence from the Frog Story

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Children express themselves and build up connections with others through narratives which consist of not only individual events but also a network of associated events. To elaborately interpret a narrative, a narrator needs to attend to both local and global aspects of the narrative. At the local level, the narrator must verbalize relevant components of a single event and should be able to infer the interrelatedness of a complex chain of events; at the global level, the narrator should attend to the gist of the narrative. The present work focuses on children's developmental progression in relating narrative events in terms of global and local structures, for the ability to make proper connections between events is crucial for constructing a coherent narrative.

Developmental psychologist endeavor to probe the local and global processing abilities in various cognitive domains. They believe that such abilities not only involve in visual perception and pattern recognition, but also motivate different levels of representations in drawing experiments. In explaining children's advances in relating narrative events, Berman and Slobin's four-phased developmental framework suggests a local-to-global progression. Karmiloff-Smith's and Sah's earlier works detects a trade-off between globally coherence-motivated organization and locally detail-motivated linguistic expressions during children's narrative development.

To further explore the developmental progression in maintaining narrative coherence, the present study, based on a cross-sectional protocol, included thirty Mandarin-speaking 5-year-olds, thirty 9-year-olds and thirty adults as subjects. The narrative data were elicited on the basis of a well-known wordless pictured book *Frog, where are you?* Three core components of the story were considered as criteria to assess subjects' ability in maintaining global coherence; one complex and one chain of events were chosen to examine subjects' ability in interpreting local chains of events.

Age main effect is yielded through our analysis, but no gender effect is detected. Our 5-year-olds are inadequate in maintaining coherence in both global and local levels. The 9-year-olds, however, are more advanced in enhancing global coherence, yet, perform below chance level for local coherence. Nearly two-thirds of them can coherently present gist of the story but only one-third of them can appropriately interpret events at the local level. The adults, as the standard of comparison, can maintain narrative coherence at both levels; they not only successfully interpret the overarching thematic structure but also provide appropriate connections between events.

Berman and Slobin's four-phased developmental framework, Karmiloff-Smith's three-phased model, and related explanations in cognitive psychology are considered in our

discussion. The outcome of this work not only advances our understanding of children's ability in maintaining narrative coherence, but also unveils the complex of linguistic and cognitive capacities that underlie children's narrative ability. More significantly, this study contributes to the sample pool of studies on the frog story some valuable narrative data from Mandarin-speaking children.

1. INTRODUCTION

Children express themselves and build up connections with others through narratives which consist of not only individual events but also a network of associated events. The proper cognitive and linguistic abilities are required to make a successful interpretation of the interconnections among events. Hence, an investigation of how young children relate narrative events may lead us to explore the nature of the relationship between language and cognition.

When thinking about narrative development, we concern with the ways in which children describe situations, and, in particular, with the development of children's capacity to relate individual events to each other, for which is crucial for the production of an elaborate narrative. Much recent research in this area has focused on data collected from children's renderings of the content of the story book *Frog, where are you?* by Mercer Mayer (1969). The book allows for different interpretations of events in the story and is a very reliable tool for tapping children's budding narrative abilities (Bamberg and Marchman 1994, Berman and Slobin 1994, Trabasso and Rodkin 1994). Thus, an analysis of the frog stories produced by narrators of different ages and from different languages may further our understanding of the abilities needed to capture and relate events in words.

Among various research based on the frog story, Berman and Slobin's (1994) decade-long project merits special attention for which conducted not only cross-sectional but also cross-linguistic analyses. Regarding cross-sectional analyses, this work included subjects of

3-year-olds, 5-year-olds, 9-year-olds, and adults. In terms of cross-linguistic analyses, the study compared narratives in English, German, Spanish, Hebrew, and Turkish. Berman and Slobin detected that the 3-year-olds already have the ability to make inferences about what is not overtly represented in the pictures in the story; that is, the 3-year-olds begin to treat the pictures in the story as events rather than just as a list of items. However, the ability to make inferences is not sufficient to provide a mature interpretation of a story. To this end, young children still need to process local and global information to provide links between the events in a story and thus to achieve thematic coherence in terms of the network of local situation and of the global story plotline.

The distinction between abilities for local and global processing can be found in the research of various cognitive domains, ranging from visual perception, drawing to autism (Brosnan et al. 2004, Karmiloff-Smith 1990, 1992, Mottron 2000, Navon 1977, Picard and Vinter 2006, Porporino et al. 2004, Spensley and Taylor 1999, Thomas and Forde 2006, Trick and Enns 1997). A similar distinction also applies to narrative ability. To elaborately interpret a story, a narrator needs to attend to both local and global aspects of the story. At the local level, the narrator must verbalize relevant components of a single event and should be able to infer the interrelatedness of a complex chain of events; at the global level, the narrator should attend to the overall, hierarchical structure of the story plotline. In Berman and Slobin's (1994) work, they noted an age-related increase in explicit reference to the global story plotline. In particular, the proportion of the 9-year-olds whose texts manifest global narrative structure is nearly twice as that of the 5-year-olds. Regarding the local structure, only 10% of their 5-year-olds appropriately interpret locally connected events, and nearly 50% of the 9-year-olds fail to make connections among these events. They thus concluded that the 5-year-olds generally had difficulty in making causal connections between the events in the story. As Berman and Slobin (1994) explain, due to the advance in cognitive ability for making inferences about situations that are not overtly represented in pictures, the 5-year-olds

begin to consider individual pictures as dynamic events; however, they can not embed individual events within a network of associated circumstances.¹ Their stories, therefore, tend to be inadequate at both global and local levels.

In the investigation of the changing functions of frames of mind (FOM) expressions² in children's narratives based on the frog story, researchers suggest a local-to-global distinction in preschoolers' use of such expressions. According to Bamberg and Damrad-Frye (1991), differentiation is made between a locally-triggered FOM expression and a globally-triggered one. The former refers to an expression motivated by an immediate situation in individual pictures, while the latter type is triggered by the overall story plotline. Bamberg and Damrad-Frye (1991) noted that all of their 5-year-olds' FOM references were motivated by the facial expressions which were in agreement with the immediately precipitating event, i.e., the local condition. For 9-year-olds, however, the importance of such facial expressions declined; instead, the overall story plotline becomes a better predictor for FOM expressions. Accordingly, with increasing age, children seemed to be able to use FOM expressions more flexibly and rely more on the global plotline, i.e., the hierarchical relationships among the events in a story.

Regarding the ways in which Mandarin-speaking preschoolers use FOM expressions, Sah's study (2006) provided significant data regarding the interaction between narrative focus and use of FOM expressions. She stated that nearly all the 5-year-olds and most of the 9-year-olds employ locally motivated FOM expressions, while all adult subjects tend to use globally triggered ones. Accordingly, the use of FOM expressions not only discloses narrators' evaluative stance on the reported actions but also unveils narrators' knowledge of the overall structure. This study also noted that the focus in the narratives of the subject children changed from a static picture-description to a dynamic event-narration. To be more

¹ Similarly, Nelson and Gruendel's (1986) claimed that children around age 5 may generate individual events well; yet, they still have difficulties in producing complete episodes in fictional narratives, especially complicated episodes.

² FOM expressions consist of references to emotional states, mental states or activities, which is crucial for a good narrative.

specific, at the beginning of the fifth year, some of her preschool subjects merely interpreted the contents of the story picture as a list of static objects, while, at the end of their fifth year, all of the subject children conceived of the pictures as events, in terms of being predications of activities or happenings. Though the study demonstrated that the 5-year-olds tended to interpret story pictures as events, it did not further analyze how the young children related the events in the story and thus unable to provide information on the developmental path for the way in which Mandarin-speaking children relate story events.

The above mentioned studies underline the distinction between the abilities for local and global processes. More interestingly, the work on narrative development not only demonstrates the dissociation between local and global processing but also delineates the preference of children at different ages. That is, there are different developmental paths for children's abilities in interpreting locally-connected events and globally-motivated story plotline. In Sah's (2007) longitudinal work on Mandarin-speaking children's narrative development, she focused on children's ability in interpreting locally-connected events. The results support Nelson and Gruendel's (1986) observation that children around age 5 can generate individual events well; yet, they still have difficulties in producing complete episodes in fictional narratives, especially the complicated episodes. In other words, most preschoolers fail to address the connection between events. The data inform us that the ability for relating events in narratives unfolds gradually and that narrator's progression from treating only one event to related event complex, implicitly or explicitly, requires linguistic as well as cognitive capacities. Due to the limited scope, however, Sah's research followed children's narrative development for merely about seven months which was not sufficient to yield any significant developmental change. Furthermore, her study only addressed the way in which young children interpret locally-connected events but failed to discuss the global aspect of event connection.

To verify earlier findings on children's ability in processing locally-driven and

globally-driven story structure, the present study provided data from a different language, i.e., Mandarin Chinese. Also, to confirm and amend Sah's (2007) findings about Mandarin-speaking children's ability in relating locally-connected events in a story, our work bases on a cross-sectional protocol. To make an appropriate link between the events in the story, a narrator needs to provide a causal connection between them.³ Hence, the present work is not only able to show the developmental progression in children's relating events in the story but also assess their ability to provide causal links between the events.

There are two research questions addressed by the present work:

- (1) Is there any difference in Mandarin-speaking 5-year-olds' and 9-year-olds' ability in interpreting overall story structure?
- (2) Do 5-year-olds and 9-year-olds tend to interpret a sequence of locally-connected events differently?

2. METHOD

2.1 Subject

Earlier studies showed that 5-year-olds and 9-year-olds display different abilities in constructing and connecting events in the story and in using FOM expressions (Bamberg and Damrad-Frye 1991, Berman and Slobin 1994, Sah 2006, 2007).⁴ Such difference in narrative ability gains support from research in developmental psychology. Among the prominent studies, Piaget's framework of cognitive development clearly state that 5-year-olds and 9-year-olds belong to different developmental stages, i.e., the former belong to the

³ The causal connection here encodes local causality for the event sequence, while the causal structure relates to the overall goal of the story plotline, i.e., searching for the missing frog, is at the global level. In the present work, we focused on the causal connection at the local level of the story organization.

⁴ We decide to include 5-year-olds as our youngest group, since we assume Earlier studies have shown that preschoolers display a considerable growth in narrative skills from age 2 to 6 (Bamberg 1987, Chang 1998, 2000, Minami 1996, Peterson and McCabe 1983). Based on the developmental data from a variety of languages, investigators indicated that 5- and 6-year-olds can already produce well-ordered narratives (Bamberg and Damrad-Frye 1991, Minami 1996, Peterson and McCabe 1983). Peterson and McCabe (1983), in a study of 1124 personal narratives of children, found that, by 6 years of age, most children are able to produce well-organized stories. Thus, we included 5-year-olds as our youngest group with the assumption that they may begin to display ability in relating events in a story.

pre-operational phase, while the latter, operational stage. To further assess the narrative abilities of children of these two age groups and to make the comparisons with finding from earlier work viable, we also consider 5-year-olds and 9-year-olds as our subjects.

Sixty Mandarin-speaking children, thirty 5-year-olds and thirty 9-year-olds, and thirty adults participated in the present study. All subjects were from similar middle-class socio-economic backgrounds. All the children were normally developing children, with no learning disabilities, or speech or hearing problems.

2.2 Material

To control the content of the fictional narratives, we used a story book, containing 24 pictures, entitled *Frog, where are you ?* (Mayer 1969) as the material to elicit fictional narratives from subjects. This book was chosen not only because it has become a worldwide research tool which renders the cross-linguistic comparisons possible, but also because it is wordless and its structure has been extensively analyzed (Bamberg 1987, Bamberg and Marchman 1990).

The frog story is a typical children's story with a hero, a problem, a series of actions following the problem, and a happy ending. In addition, its content and context are age-appropriate to preschoolers. The book is suitable to our research goals since it depicts an elaborate series of events which allow the narrator to provide various links among events and to take different perspectives on events.

2.3 Data Collection

Rapport was first established in the observation periods. The interviews were carried out individually with each subject, and consisted of an initial warm-up conversation followed by a narrative task, which is based the wordless book, *Frog, where are you*. The subjects were first asked to look through the entire book and then asked to tell a story while looking at the

pictures. The entire interviews were audio-taped and subsequently transcribed.

2.4 Data Analysis

In order to verify the accuracy of the transcription, nine transcripts were randomly selected and were fully transcribed and coded by another native Mandarin Chinese speaker. Cohen's kappa statistics were used to assess inter-rater reliability. The inter-rater agreement result was 90%.

After the transcriptions were done, qualitative analyses were performed to assess the ways in which the subjects interpreted the events in the story. Our analyses were twofold: global as well as local structure of the story. Regarding the global structure, we consider three components are crucial for interpreting contents of the story as a whole (Labov and Waletzky 1967, Shen 1988, Berman and Slobin 1994). The three components are: the initiating goal, the unfolding part, and the outcome. To make viable the comparison with earlier findings, we adopted Berman and Slobin's (1994) criteria to score the narrative production:

- (1) The initiating goal is considered if the narrator explicitly mentions the boy protagonist's noticing that the frog is missing.
- (2) The unfolding part is scored for explicit mention of searching or calling for the frog.
- (3) The outcome is considered is if the frog the boy takes home is explicitly described as the same or as the substitute for the lost pet frog.

Due to the limited scope of the present work, our analyses for the locally-connected events focused on Picture 3, Picture 14 and 15 of the frog story; the former is a complex event and the latter perhaps presents the most difficult challenge, both conceptually and linguistically. To successfully elaborate Picture 3, a narrator needs to include five components:

1. change of state event (the boy has woken up)
2. temporal location (in the morning, the next morning)
3. inferencing that the protagonist learns something (the boy sees, discovers, realizes):
the plot-advancing elements
4. the state of affairs which is depicted (the jar is empty) or inferred (frog has gotten lost, disappeared, run away)
5. the protagonist's response – either subsequent action (get out of bed to look for the frog) or affective reaction (feeling surprised, concerned, curious): attendant circumstances or motivation.

As for Pictures 14 and 15, they present a complex chain of events. Picture 14 functions as the background event for what happens in this sequence of events. To begin with, Picture 14 shows the boy-protagonist climbing up on a rock to call for his frog. While the boy is on the rock, he grabs something which he believes are the branches of a tree. In Pictures 15, the branches turn out to be a deer's antlers. Thus, these two pictures involve a misconception on the boy-protagonist's part and the consequence that results.⁵ Given the nature of the interrelatedness in this sequence of events, the narrator is required to provide causal links between the two events by pointing out the misconception of the boy-protagonist in order to show competent verbalization.

Based on the results of Berman and Slobin's (1994) work and the earlier work on Mandarin-speaking children (Sah 2007), the present study adopted Berman and Slobin's classification, with minor modifications, to render the cross-linguistic comparisons viable. Accordingly, subjects' interpretation of these two pictures may fall into one of four categories:

⁵ Picture 15 also works as the precursor of Pictures 16 and 17 which reveal the consequences of the boy's misconception: the deer runs to a cliff with the boy; the dog runs alongside and barks at the deer; the deer throws the boy off the edge of the cliff and the dog also falls off. In other words, the boy's unintentional act in the initial event of Picture 15 leads to a series of consequences later in Pictures 16 and 17. The inter-connection among these three pictures, though very intriguing, is beyond the scope of the present work. To better focus our discussion, we analyzed only Pictures 14 and 15.

(1) one event; (2) two unrelated events; (3) related events, with the boy’s misconception implied; (4) related events, with the boy’s misconception explicitly mentioned. Causal connection was considered provided if the boy’s misconception was addressed explicitly or implicitly.

3. RESULTS AND DISCUSSION

3.1 Global Structure

Figure 1 displays an age-related increase in percentage of explicit reference to the cardinal elements of the plotline. To be more specific, less than one-third of the 5-year-olds explicitly mention these main elements in the story, over sixty percent of the 9-year-olds explicitly refer to these components, while the adults demonstrate the ceiling effect for the first two components.

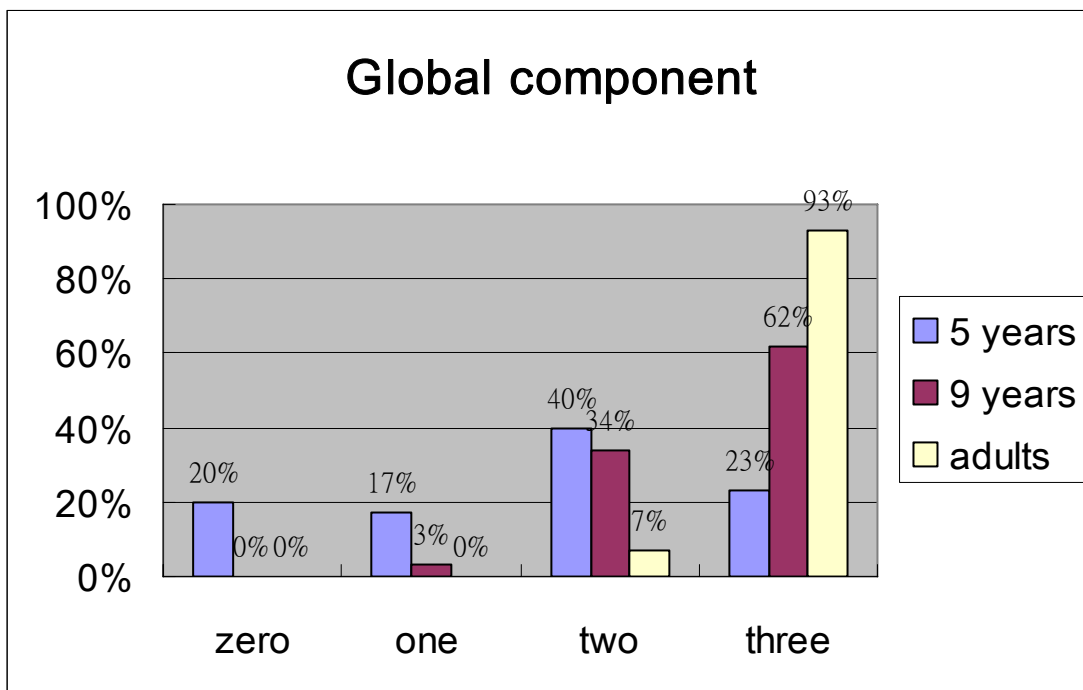


Fig 1. Explicit References to Global Story Components, by Component

Table 1 shows an increase in difficulty for each of the three core components. Subjects

across all age groups can appropriately interpret the first core component of the story. For Component II, the 9-year-olds and adults can still successfully present the connection; only half of the 5-year-olds, however, can achieve this. Among the three components, the third component is the most challenging one for all three groups of subjects. Moreover, age difference is clearly shown in subjects' interpretation of this component. 90% of the adults and 50% of the 9-year-olds can explicitly mention this component is their narrative production, while less than 30% of the 5-year-olds can achieve this.

	5-year-old (N=30)	9-year-old (N=30)	Adult (N=30)
Component I	20	27	30
Component II	15	29	30
Component III	15	19	28

Table 1: Distribution of explicit reference to three story components by different subject group

3.2 Local Structure

As mentioned earlier, to elaborately interpret a story, a narrator needs to attend to not only the overall, hierarchical structure of the story plotline but also the local aspect of the story. At the local level, the narrator must verbalize relevant components of a single event and should be able to infer the interrelatedness of a complex chain of events.

Figure 2 displays the number of components mentioned by our subjects. Less than 10% of the 5-year-olds include up to five components for this picture. Nearly one-third of the 9-year-olds elaborate this event by relating five components. More than 70% of the adults can

successfully interpret Picture 3.

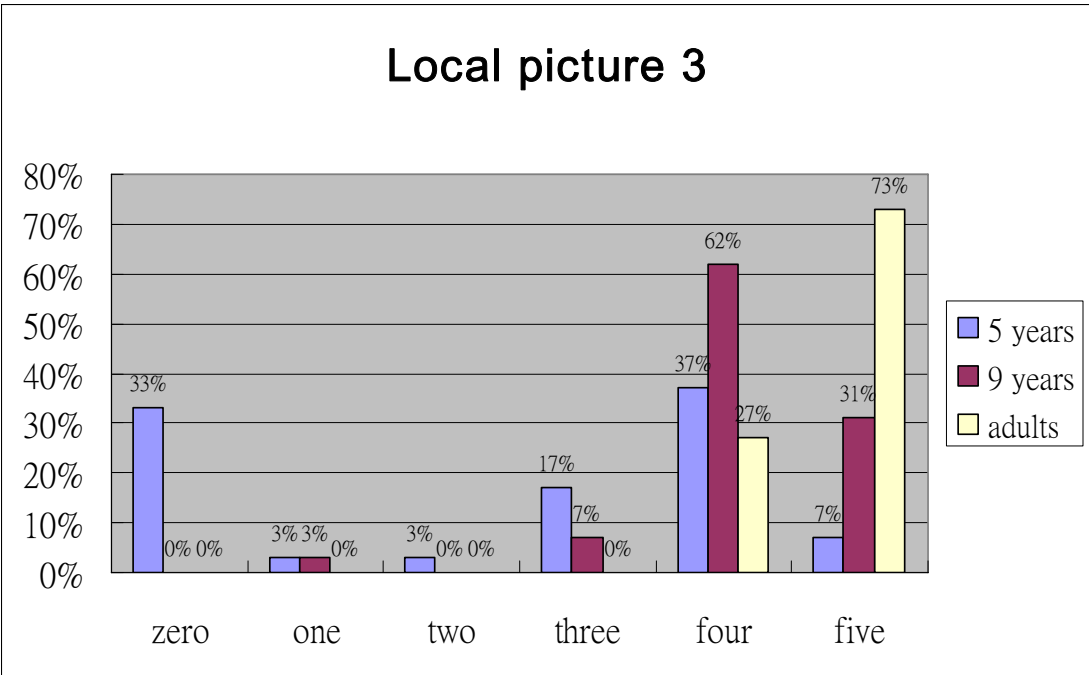


Fig. 2. Number of Component Parts in Pictures 3 Referred to, by Component Parts

Berman and Slobin (1994) considered Pictures 14 and 15 in the frog story to be the most complex network of events in the frog story, for even 9-year-olds may not display fully mature abilities in interpreting this sequence of events. According to them, a proficient narrator can be expected to treat the scenes in Pictures 14 and 15 as related events. Hence, a child providing a mature interpretation of these events should explain the causal connections between them by pointing out the boy’s misconception.

Figure 3 demonstrates the four different ways in which our subjects interpreted the events in Pictures 14 and 15 across three age groups. Merely 10% of the 5-year-olds can successfully relate these two pictures by pointing to the boy’s misconception. Though the 9-year-olds did better than the younger group, there is only 21% of them can successfully elaborate the series of events. Compared with children, adults perform exceedingly well. There are over two-thirds of the adults relate these two pictures successfully.

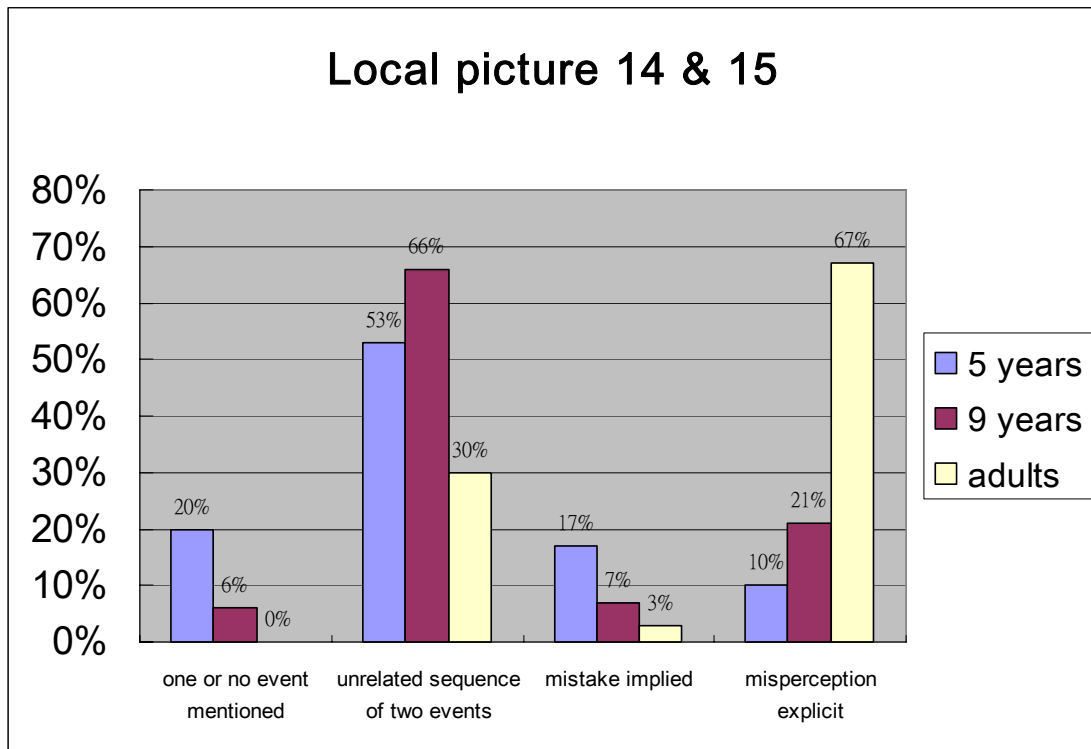


Fig. 3. Relation between Two Events in Pictures 14 and 15, by Relation

Each case is illustrated by one specific excerpt given below. To begin with, in Excerpt 1, the child, CRS, mentioned only one event in which he showed that he, CRS, was trying to make sure whether the animal in the picture was a lamb, a deer, or a moose: 又有一隻羊... 那是什麼鹿呀? 那個是梅花鹿啊... 麋鹿哦麋鹿 ‘There is a sheep... What kind of deer is it? That is a spotted deer.... Moose! Oh, a moose’.

Excerpt 1: CRS

然後呢 - 又有一隻羊 - 又有一隻 - 那個 那個 - 那是什麼鹿呀 - 那個是梅花鹿啊 - 不是在下雪的那邊有的 - 麋鹿 - 哦 麋鹿

ran2hou4 ne1 - you4 you3 yi4 zhi1 yang2 - you4 you3 yi4 zhi1 - na4ge na4ge - na4shi4 she2mo lu4 ya1 - na4ge shi4 mei2hua1lu4 a1 - bu2shi4 zai4 xia4xue3 de na4bian1 you3de - mi2lu4 - o2 mi2lu4

And then... there is a sheep... another one. that. that. What kind of deer is that? That is a spotted deer. It does not belong in the snow. Moose! Oh, a moose.

In Excerpt 2, LCF made an implicit connection between the two events by saying 他抓住一枝樹枝是一隻麋鹿 ‘He grabs onto a tree branch and it is a reindeer’. However, while LCF included the transition from tree branches to antlers in their narration, at the same time she failed to present the transition in a more explicit way, i.e., by pointing out that the boy grabbed the antlers as a consequence of his misconception of what was in front of him.

Excerpt 2: LCF

他抓住一枝樹枝是一隻麋鹿 - 然後呢他就說說說：「小蛙你在哪裡啊？」 - 然後呢 - 嗯小鹿就那隻麋鹿就把小男孩這樣叨起來 - 然後呢那隻那個小男孩就說那個小文就說說：「你叫什麼名字？」 - 「我叫小鹿」 - 然後呢「你有沒有看到我的青蛙？」 - 「沒有可是我知道有很多青蛙的地方喔。」 - 然後呢小男孩就騎在那個麋鹿的背上

tal zhua1zhu4 yi4 zhi1 shu4zhi1 shi4 yi4 zhi1 mi2lu4 – ran2hou4 ne tal jiu4 shuo1 shuo1 shuo1 : 「xiao3wa1 ni3 zai4 na3li3 a1 ? 」 - ran2hou4 ne1-en1 xiao3 lu4 jiu4 na4zhi1mi2lu4 jiu4 ba3 xiao3 nan2hai2 zhe4yang4 diao1 qi3lai2 – ran2hou4 ne1 na4zhi1 na4 ge xiao3 nan2hai2 jiu4 shuo1 na4 ge xiao3wen2 jiu4 shou1 shou1 : 「ni3 jiao4 she2mo ming2zi4 ? 」 - 「wo3 jiao4 xiao3lu4 」 - ran2hou4 ne1 「ni3 you3 mei2you3 kan4dao4 wo3de qing1wa1 ? 」 - 「mei2you3 ke3shi4 wo3 zhi1dao4 you3 hen3 duo1 qing1wa1 de di4fang1 o1 」 - ran2hou4 ne1 xiao3 nan1hai1 jiu4 qi2 zai4 na4ge mi1lu4 de bei4 shang4

He grabs onto a tree branch and it is a reindeer. And then he asks, asks, asks, “Little frog, where are you?” And then the deer which turns out to be a moose picks up the boy with its mouth. And then the little boy says that, Little Wen asks, asks “What is your name?” “My name is Little Deer.” And then “Have you seen my frog?” “No, but I know a place with a lot of frogs.” And then the little boy rides on the back of the moose.

The distinction between two distinct events and two related events is exemplified by Excerpts 3 and 4. In Excerpt 3, TYH related the two events in a straightforward temporal

contiguity: 然後就爬到樹上...然後他就扶在鹿的角 ‘Then he climbs to the top of the tree... And then he is holding onto the deer’s horn’. This way of linking one event to the next by using *then*, *and*, and *and then* is typical of most 5-year-olds across languages (Berman 1988). Shen (1990) further identified such a way to connect events as ‘local temporal’. In Excerpt 4, YEC, a 9-year-old seems to be conceptually and linguistically better equipped, so she started to provide causal links between the events by explicitly referring to the boy’s mistake in the nature of the object before him: 他以為那根是樹枝 - 就扶著那個東西 - 結果是一個一隻鹿 ‘he thinks that it is a branch so that he holds on to it. Yet, it turns out to be a deer’.

Excerpt 3: TYH

然後就爬到樹上-狗就在下面趴-然後他就扶在鹿的角-鹿-然後那個鹿就起來-然後把那個人撞到牠的眼睛上面

ran2hou4 jiu4 pa2dao4 shu4 shang4 -gou3 jiu4 zai4 xia4mian4 pa1 - ran2hou4 ta1 jiu4 fu2zai4 lu4 de jiao3 - lu4 -ran2hou4 na4ge lu4 jiu4 qi3lai2 - ran2hou4 ba3 na4ge ren2 zhuang4dao4 ta1de yan3jing1 shang4mian4

Then he climbs to the top of the tree. The dog is crawling around the bottom there. And then he holds onto the deer’s horn. The deer. And then the deer stands up. And then it hits the person on its eyes.

Excerpt 4: YEC

他躲牠他 .他爬到小山丘上 - 發現了一個東西 - 他以為那根是樹枝就扶著那個東西 - 結果是一個一隻鹿

ta1 to3 ta1 ta1 ta1 pa2tao4 hsiao3 shan1chiu1 shang4 - fa1hsien4 le ilko tung1hsi1 - ta1 i3wei2 na4ken1 shih4 shu4chih1 chiu4 fu2che na4ko tung1hsi1 - chieh2kuo3 shih4 ilko ilchih lu4

He hides. He climbs a little hill and finds something. He thinks that it is a branch so that he holds on to that thing. Yet, it turns out to be a deer.

In Excerpt 4, the 9-year-old boy makes explicit mention of the protagonist's misconception by using the FOM term 'think' 以為 to provide transition. Excerpt 5, from an adult, provides another example for making explicit connection of events.

Excerpt 5: LCJ

他爬到樹 - 爬到石頭的頂端 - 抓著樹枝 - 然後大喊著小青蛙 - 卻在這個時候樹枝動了起來 - 他才發現那是一隻鹿

ta1 pa2 tao4 shu4 - pa2 tao4 shih2tou2 te ting3tuan1 - chua1 che shu4chih1 - jan2hou4 ta4 han3 che hsiao3 ching1wa1 - chueh4 tsai4 che4 ko shih2hou4 shu4chih1 tung4 le chi3lai2 - ta1 tsai2 fa1hsien4 na4 shih4 i1 chih1 lu4

He climbs the tree. (He) climbs to the top of the stone. He holds the tree branch. Then he calls for the little frog. But then the branch starts moving. He then realizes that it is a deer.

Taken together, the results lead us to speculate that the inference of the causal connection is beyond the capacities of the 5-year-olds in this study. Also, as Berman and Slobin (1994: 56) noted, mature rendering of this sequence of events requires “backtracking” in on-line linguistic production and also perceptual and conceptual processing.⁶ In other words, to successfully interpret this sequence of events, narrators need to be equipped with capacities at three levels: the prepackaging information of in on-line linguistic processing, perceptual attentiveness, and conceptual awareness. Having more advanced backtracking abilities, the adults perform a lot better than both groups of children, and the 9-year-olds also outperform the 5-year-olds in presenting appropriate links between events in the story.

The data in Excerpt 6 form another interesting contrast with that in Excerpt 7. As mentioned above, TY in Excerpt 6 made an explicit connection between Pictures 16 and 17 by referring to the boy-protagonist's misconception. Although TY yielded a proper rendering of

⁶ The hesitations and pauses detected by Berman and Slobin (1994) provide evidence for the narrator's on-line linguistic backtracking as he or she tries to link the two events.

the two events by encoding local causality, his text was highly condensed and contained impoverished linguistic and descriptive details. Excerpt 7, in contrast, failed to establish a causal connection between the two events, but manifested a richness of linguistic expressions which involved interpretative comments and an elaborate evaluative flavor: 他爬上去找也找不到...那個小男孩呢好像要被抓走一樣喔 ‘The boy climbs to the top but can not find it... That little boy looks as if he is being taken away’. The contrast between Excerpts 6 and 7 leads us to speculate a possible dissociation in the ability to provide linguistic expressions and that for inferring relations between events.

Excerpt 6: TY

小朋友就爬到那個石頭上 - 抓著鹿的角 - 以為是樹根 - 然後鹿把小朋友的屁股網到頭上面啦 - 腳在那個 - 手跟腳 - 手跟頭都在鹿的後面

xiao3 peng2you3 jiu4 pa1dao4 na4ge shi2tou2 shang4 – zhua1zhe lu4 de jiao3 – yi3wei2 shi4 shu4gen1 – ran2hou4 lu4 ba3 xiao3 peng2you3 de pi4gu3 wang3dao4 tou2 shang4mian4 la – jiao3 zai4 na4ge – shou3 gen1 jiao3 – shou3 gen1 tou2 dou1 zai4 lu4 de hou4mian4

The kid climbs onto that rock and grabs the deer’s horn. He thinks that it is a branch. And then the deer gets the kid’s butt over its head. The leg is at that. The hand and the leg. The head and the hands are both behind the deer.

Excerpt 7: LTC

小男孩他爬上去找也找不到 - 突然呢旁邊有一個貓頭鷹 - 然後呢看到了一個馴鹿 - 馴鹿呢就揹著一個小男孩 - 那個小男孩呢好像要被抓走一樣喔

xiao3 nan2hai2 ta1 pa2 shang4qu4 zhao3 ye3 zhao3 bu2 dao4 – tu2ran2 nei1 pang2bian1 you3 yi2 ge4 mao1tou2ying1 – ran2hou4 nei1 kan4dao4 le yi2ge xun2lu4 – xun2lu4 nei1 jiu4 bei1 zhe yi2ge xiao3 nan2hai2 – na4ge xiao3 nan2hai2 nei1 hao3xiang4 yao4 bei4 zhua1 zou3 yi2yang4 o1

The little boy climbs to the top but can not find it. Suddenly there is an owl nearby. And then he sees a reindeer. The reindeer carries a little boy. That little boy looks as if he is being taken away.

The content of Excerpts 6 and 7 not only display the above-mentioned dissociation, but also imply that children's development in relating narrative events may be treated as a problem-solving process, as proposed by Karmiloff-Smith (1984). Through inspecting the development of a variety of cognitive abilities, including the use of principles in physics, the drawing of spatial circuits, the use of cohesive devices for storytelling and the reading of maps, Karmiloff-Smith (1984) proposed a Three Phase Model for children's problem-solving, which she believed might apply to many domains.⁷ In this process-oriented theoretical model, narrative development is regarded as a problem-solving process.

The first phase of the Three Phase Model is the "procedural phase," which is characterized as an external data-driven process. The generated representations at this phase are independently stored. The second phase is termed the "metaprocedural phase." The linguistic or behavioral output at this phase is predominantly the product of top-down control. Since the overall organization may dominate the generated representations, the output of Phase 2 tends to be less elaborate in detail. Also due to the precedence of overall organization, the previously isolated procedures may be integrated into a single representational framework. The third phase is called the "conceptual phase," in which neither the data-driven nor the top-down process predominates. At this phase, children are in control of both the external data and the internal representation, and there is a balance in the interaction between data-driven and top-down processes.

As the Three Phase Model predicts, the development of top-down organization may sometimes be at the expense of the bottom-up descriptive details and lexical richness. Such

⁷ Karmiloff-Smith (1983, 1984) made distinctions between developmental *stage* and *phase*. The former is attached to particular age ranges; the latter, however, is not age-related. In addition, phases are recurrent across different aspects of a domain.

reasoning is exemplified by Excerpt 6, in which the boy, TY, was motivated by the top-down organization so he focused on links between events yet provided only impoverished descriptive details. In contrast, in Excerpt 7, LTC focused on data in the immediate situation by providing rich interpretative and evaluative comments but failed to elaborate connection for the sequence of events. In terms of Karmiloff-Smith's model, these two 5-year-olds, at Time 3, worked at different phases while trying to interpret this sequence of events. For instance, TY had already entered Phase 2, while LTC and most other children were still at Phase 1. Nevertheless, neither LTC nor TY can be regarded as a proficient storyteller, for, to tell a story successfully, the speaker must integrate the connection of events and linguistic production. In other words, to present a mature narrative, the narrator needs to create a balance in the interaction between the top-down, organization-driven process with the bottom-up, detail-driven process, which is the result of Phase 3.

To sum up, our data inform us that the ability to relate events in narratives unfolds gradually. Our subjects link the global story plotline better than elaborate the local connection. Regarding the local event, age effect does display. In particular, for the complex chain of events in Pictures 14 and 15, the narrator's progression in treating a sequence of events first as unrelated events then as related ones requires proper linguistic and cognitive capacities. On the one hand, we noted that most of our 5-year-olds and 9-year-olds could not appropriately link the sequence of events and thus tended to treat the events as single, unrelated ones. On the other hand, most adults provide causal links, implicitly or explicitly, for this sequence of events. However, though an advanced ability in making causal inferences fosters a successful interpretation of the interconnections among the network of events, rich linguistic expressions are also required to encode the situation. In the present work, we detected dissociation between the ability for making causal links and that for producing linguistic expressions. Such dissociation is explicable in terms of Karmiloff-Smith's problem-solving model, which suggests that children of the same age may work at different problem-solving

phases and implies that there may be a trade-off between top-down coherence-motivated organization and bottom-up detail-oriented linguistic expressions during children's narrative development.

4. CONCLUSION

Narrative activities have long been of interest to psycholinguists, as they provide rich information about children's language as well as cognitive development. To elaborate a story, children need to infer about what is not visible in the printed pages, ranging from interpreting the inner states of mind of the characters in the story to making connections between events. In the present work, our children have better control over the global structure of the story than the local structure. Nearly one-third of the 5-year-olds and over 60% of the 9-year-olds can refer to the global plotline. For the local structure, however, merely 10% of the 5-year-olds and less than one-third of the 9-year-olds can coherently interpret the events. Our data suggests a developmental progression in interpreting the target sequence of events, first as unrelated events and then as related ones.

The rarity of reference to a connection between events in our data may be attributed to the precedence of an individual event over a sequence of events at this developmental period. According to Piaget (1962, 1969), children between ages 4 and 7 may be considered to be at an intuitive period.⁸ During this period, young children's understanding of objects or events mainly relies on the most salient perceptual feature of the target things, rather than on logical or rational thinking processes. The 9-year-olds' reasoning, however, belong to a different developmental stage, i.e., the concrete operational stage. Accordingly, they may perform better in providing logical or coherent links for story event(s). Such reasoning helps to explain why children of different ages tend to have different preference in relating events in the story.

⁸ The mean age of our preschoolers was 5;5 months at the first session of data collection and 5;11 months at the last session. Thus, they belong to the intuitive period.

In addition, as Berman and Slobin (1994) pointed out, in order to elaborate a network of events, a narrator should be equipped with complex backtracking abilities at perceptual, conceptual and on-line verbal production, which are beyond the capacities of the 5-year-olds. Such backtracking capacities take time to develop and thus our 5-year-olds were not able to master them well, while the 9-year-olds demonstrate marginally better skills in this aspect. Similarly, Hedberg and Fink (1985) and Roth and Spekman (1986) claimed that the ability to provide an elaborate interpretation of a complex chain of events might not fully unfold before children reach age 10.

Another plausible reason for the lack of causal connection in our data may lie in the 5-year-olds' limitations in theory of mind and linguistic encoding ability.⁹ Cognitively, the target sequence of events requires making a differentiation between the narrator's omniscient perspective and the boy's lack of knowledge about the situation. The ability to make such a distinction demands the work of theory of mind to make shifts between different stances. Linguistically, the narrator needs to encode each of the different stances involved (Berman and Slobin 1994, Chafe 1994). Our 5-year-olds seemed not to be well-equipped with abilities in these two aspects, and, therefore, most of them failed to interpret the causal connection clearly.

On inspecting the data, we note that cognitive and linguistic abilities may be dissociable in developmental paces. In particular, our data suggest dissociation between the ability to provide descriptive details and that for inferring causal relations between events.¹⁰ In terms of Karmiloff-Smith's (1984) model for problem-solving, most of our 5-year-olds were working at Phase 1, while the 9-year-olds evolved to work at Phase 2. In addition, there seemed to be a trade-off between top-down organization and the bottom-up descriptive details

⁹ Theory of mind refers to the realization that just as I have feelings, desires and beliefs so do other people. Researchers point out that children's knowledge about theory of mind takes several years to develop (Astington 1990, Chandler and Sokol 1999).

¹⁰ The ability for providing descriptive details is the linguistic capacity; the one for inferring connection between events is the cognitive capacity.

in the narratives produced by children. However, a narrator needs to enter Phase 3, as shown by adults, to integrate the top-down coherence-motivated organization with the bottom-up, data-driven descriptive details in order to present a mature narrative for this sequence of events.

With these analyses we hope that we have pointed out the nature of developmental progression in narrative coherence from children's story. Though this study unveiled the developmental progression in Mandarin-speaking children's interpretation of a sequence of events and the dissociation in abilities necessary to provide descriptive details and to infer relations between events, care should be taken when we try to generalize our findings to all children. The findings obtained here ought to be amended or augmented by studies using a larger amount of subjects, from which more credence will be gained.

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