

**A LONGITUDINAL INVESTIGATION OF MANDARIN-
SPEAKING PRESCHOOLERS' RELATION OF EVENTS
IN NARRATIVES: FROM UNRELATED
TO RELATED EVENTS***

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ABSTRACT

This study focuses on the way preschoolers relate events in a story. Twelve Mandarin-speaking preschoolers served as subjects; their narratives were elicited through the use of a picture book, *Frog, where are you?* Our data suggest that children's progression from treating single, unrelated events to related ones requires proper linguistic and cognitive capacities. The data also support earlier findings that most 5-year-olds are not able to relate a chain of events well. Additionally, it is found that there is dissociation in abilities for producing linguistic expressions and for inferring relations between events. We try to interpret the dissociation in terms of Karmiloff-Smith's problem-solving model.

Key words: unrelated events, related events, Mandarin-speaking preschoolers

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

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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 provide links between the events in a story to achieve thematic coherence in terms of the overall story plotline. As Berman and Slobin noted, only 10% of their 5-year-olds regarded events in Pictures 16 and 17 in the frog-story book as related, and nearly 50% of the 9-year-olds failed 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 these pictures. Such reasoning was highly plausible, yet the study was based on cross-sectional data which inherently involved a wide range of individual differences. Moreover, the subjects were tested only once in the cross-sectional studies. To

verify Berman and Slobin's findings, a longitudinal investigation based on the same research material is thus needed.

In Sah's study (2006) on the narrative production of the frog story by Mandarin-speaking preschoolers in Taiwan, she 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 of activities or happenings. The study provided significant data regarding the interaction between the narrative focus and the use of frames of mind (FOM) expressions.¹ However, 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.

In the investigation of the changing functions of FOM expressions in children's narratives based on the frog story, researchers suggest a local-to-global distinction in preschoolers' use of such expressions (Bamberg and Damrad-Frye 1991, Sah 2006).² A similar local-global distinction can also be seen in the way preschoolers relate story events. A narrator needs to attend to both local and global aspects of the story in order to provide an elaborate interpretation of a story. At the local level, the narrator must verbalize the 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 plotline of the story. As Berman and Slobin (1994) noted, due to the advance in cognitive ability for making inferences about situations that are not

¹ FOM expressions consist of references to emotional states, mental states or activities, which is crucial for a good narrative.

² Distinctions are 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 nine-year-olds, however, the importance of such facial expressions declined; instead, the overall story plotline became 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.

overtly represented in pictures, preschoolers consider individual pictures as dynamic events; however, they can not embed individual events within a network of associated circumstances.³ Their stories, therefore, tend to be inadequate at both global and local levels, i.e., with regard to the hierarchical structure of the global story plotline and with regard to the local level of connecting the relevant component parts of a sequence of events.

Berman and Slobin (1994) considered Pictures 16 and 17 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. To verify their findings with regard to the 5-year-olds' ability in relating the events in a story, the present study provided longitudinal data from a different language, i.e., Mandarin Chinese, and also focused its analysis on these two pictures. To make an appropriate link between the events in the two pictures, a narrator needs to provide a causal connection between them.⁴ Hence, the present work is not only able to show the developmental progression of the 5-year-olds in interpreting a sequence of events but also assess their ability to provide causal links between the events.

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. Minami (1996), in a study of the data of 20 Japanese preschoolers, found that 5-year-olds, compared with younger children, begin to apply evaluation in an adult-like way. Similarly, Chang (1998), in a study of 24 Mandarin-speaking children,

³ 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.

⁴ 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.

noticed that 6-year-olds use clearer reference and more temporal connectives and sequencers in their narratives than younger children.

Researchers in the field of child development also indicate qualitative shifts in cognition around 6 years of age. Most notable among all is Piaget (1969), who stated that children's thoughts change from a pre-operational to a concrete-operational stage around this age. In addition, the findings from a number of empirical and theoretical studies also support that there are qualitative shifts in cognition between 5 and 7 years of age (for review, see White, 1965).⁵ Thus, we followed children around age five and a half for six months with the assumption that they may display developmental changes in the ways in which they relate the events in a story.

There are two research questions addressed by the present work:

- (1) Do Mandarin-speaking 5-year-olds tend to interpret a sequence of events as single, unrelated events or related ones?
- (2) Can the same 5-year-olds make better causal connections between related events over time?

Based on the afore-mentioned literature, general hypotheses are put forward in correspondence with the research questions:

- (1) Due to limitations in cognitive and linguistic abilities,⁶ most 5-year-olds tend to treat a sequence of events as single, unrelated events rather than related ones.
- (2) Most 5-year-olds cannot provide causal links for a sequence of events during their fifth year of life.

2. METHOD

⁵ According to White (1965), children display adult-like thought at the age of six. It is also around this age that children begin to generate adult-like narrative structure. From then on, children inhibit the strategy of saying whatever comes to their mind. Instead, they plan their narratives to be more comprehensible to their listeners.

⁶ Cognitive ability here refers to the ability to infer a causal relationship between narrative events.

2.1 Subject

Twelve Mandarin-speaking children, six boys and six girls, chosen from nursery schools, participated in the present study. All the subjects were from similar middle-class socio-economic backgrounds. They were all normally developing children, with no learning disabilities, or speech or hearing problems. The mean age of the children was 5;5 months at the time of the first session of data collection, 5;8 months at the second session, and 5;11 months at the last session. Based on the earlier findings on children's development of language and cognition (Bamberg and Damrad-Frye 1991, Minami 1996, Peterson and McCabe 1983, White 1965), we observed children of this age span with the assumption that they may display developmental changes in relating events in a story.

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 period in schools. The interviews were carried out individually with each child, and consisted of an initial warm-up conversation followed by a narrative task.

Children's narratives were elicited on the basis of 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 narrative data were collected at three different time points when the subjects were of mean ages 5;5 (Time 1), 5;8 (Time 2), and 5;11 (Time 3).⁷ The entire interviews were audio-taped and subsequently transcribed.

2.4 Data Analysis

In order to verify the accuracy of the transcription, nine transcripts, with three from each time point of data collection, 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 91%.

After the transcriptions were done, qualitative analyses were performed to assess the ways in which preschoolers interpreted the events in the story. Due to the limited scope of the present work, our analyses focused on Pictures 16 and 17 of the frog story, which perhaps present the most difficult challenge for preschoolers compared with the other pictures, both conceptually and linguistically. Picture 16 functions as the background event for what happens in this sequence of events. To begin with, Picture 16 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 17, 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.⁸ Given the nature of the interrelatedness in this sequence of

⁷ As Preece (1987) noted, the same narrator may produce repeat performances in which the narratives share the same topic and contain similar content. He valued the strengths of 'repeat performances,' for repetitions of this sort might provide insights into what elements in a narrative a child considers worth describing. He further suggested that repeat performances afford the opportunity for us to make comparisons of a similar narration delivered on different occasions. Therefore, the present work used the same book for three data-collecting sessions to track the developmental progression and to make the comparisons viable.

⁸ Picture 16 also works as the precursor of Pictures 18 and 19 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

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 preliminary findings of my pilot study, the present study adopted Berman and Slobin's classification, with minor modifications, to render the cross-linguistic comparisons viable. Accordingly, preschoolers' 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

As mentioned earlier, a proficient narrator can be expected to treat the scenes in Pictures 16 and 17 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. Inspecting the data, we noted that only four out of our twelve preschoolers were able to provide causal links between Picture 16 with Picture 17 by referring to the boy's misconception and that these four subjects did not infer the causal connection until Time 3.

Among them, TYH and TK made explicit mention of the misconception: 抓著鹿的角, 以為是樹根 'grabs the deer's horn. He thinks that it is a branch' (Excerpt 1); 他說:「那個, 那個根原來是麋鹿的角」'he says, "That that root is actually the moose's horn."' (Excerpt 2). The FOM reference 以為 'think'⁹ and the term 原來 'originally/actually'

the dog also falls off. In other words, the boy's unintentional act in the initial event of Picture 16 leads to a series of consequences later in Pictures 18 and 19. 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 16 and 17.

⁹ As Tager-Flusberg and Sullivan (1995) stated, a good story-teller often explains the actions of the characters in a story by referring to the characters' motivations or mental states. The use of FOM expressions is one such way to interpret one's own and others' actions.

were used to signal the boy's misconception. The other two preschoolers, LCF and TSY, made an implicit connection between the two events. In Excerpt 3, LCF made a link between the two pictures 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'; similarly, TSY said他抓手抓到的東西是鹿角 'The thing he grabs is the deer's horn.' However, while both LCF and TSY included the transition from tree branches to antlers in their narration, at the same time they 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 1: TYH (Time 3)

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 2: TK (Time 3)

然後他就抓著一個樹幹說：「青蛙你在哪裡？」- 結果呢
青蛙還是沒有回來 - 嗯 - 那個小狗那個小狗在看那個
小孩在哪裡 - 結果是一個麋鹿在那個下面 - 他他
說：「那個那個根原來是麋鹿的角」

*ran2hou4 ta1 jiu4 zhua1zhe yi2 ge shu4gan4 shuo1 :「qing1wa1 ni3 zai4
na3li3 ?」 - jie2guo3 ne1 qing1wa1 hai2shi4 mai2you3 hui2lai2 - en1 -
na4ge xiao3gou3 na4ge xiao3gou3 zai4 kan4 na4ge xiao3hai2 zai4
na3li3 - jie2guo3 shi4 yi2 ge mi2lu4 zai4 na4ge xia4mian4 - ta1 ta1
shuo1 :「na4ge na4ge gen1 yuan2lai2 shi4 mi2lu4 de jiao3」*

He grabs onto a tree branch and asks, “Frog, where are you?” Yet, the frog still does not come back. That little dog that little dog is looking for the child. Then it turns out that a moose is down there. He, he says, “That that root is actually the moose’s horn.”

Excerpt 3: LCF (Time 3)

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
就把小男孩這樣叼起來 - 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.

Excerpt 4: TSY (Time 3)

後來他就找到一棵樹 - 他就跑到上面叫：「小青蛙。」 -
他抓手抓到的東西是鹿角

*hou4lai2 ta1 jiu4 zhao3dao4 yi4 ke1 shu4 - ta1 jiu4 pao3dao4
shang4mian4 jiao4 : 「xiao3 qing1wa1. 」 - ta1 zhua1 shou3 zhua1dao4 de
dong1xi1 shi4 lu4jiao3*

Later, he finds a tree. He then runs to the top and calls out, "Little frog."
The thing he grabs is the deer's horn.

Table 1. Number of Event(s) in Pictures 16 and 17 Referred to
by Preschoolers Across Three Time Points (N=12)

	Time1	Time 2	Time 3
One event	5	4	2
Two unrelated events	7	8	6
Implicitly related events	0	0	2
Explicitly related events	0	0	2

In responding to the first research question, the data in Table 1 revealed that most of our 5-year-olds had difficulty in connecting events in this sequence of events throughout their fifth year, which supports Berman and Slobin's (1994) findings. Similar developmental tendencies were also detected in both studies, i.e., that with increasing age, fewer and fewer preschoolers mentioned only one event for these two pictures, and also that, near the end of their fifth year, some children not only mentioned the two events but also began to provide implicit or explicit connections between the two events.

Table 1 demonstrates the four different ways in which our 5-year-olds interpreted the events in Pictures 16 and 17 across three time points. Each case is illustrated by one specific excerpt given below. To begin with, in Excerpt 5, 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 5: CRS (Time 1)

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

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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.

The progression from two distinct events to related events is exemplified by the pair of excerpts: Excerpts 6 and 1. In Excerpt 6 (Time 2), 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’. Three months later (Time 3), as shown in Excerpt 1, the same child seemed to be conceptually and linguistically better equipped, so he started to provide causal links between the events by explicitly referring to the boy’s mistake in the nature of the object before him: 抓著鹿的角, 以為是樹根 ‘grabs the deer’s horn. He thinks that it is a branch’.

Excerpt 6: TYH (Time 2)

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-然後把那个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.

Regarding the second research question, our data revealed that most of our 5-year-olds could not provide causal links for this sequence of events throughout the fifth year of their life. As Table 1 displays, only

four children provided links, explicit or implicit, between these events near the end of the fifth year. In particular, only two children among them, TYH and TK, made explicit mention of the causal connections between the two events. 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. 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.¹⁰ 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.

The data in Excerpt 7 form another interesting contrast with that in Excerpt 1. As mentioned above, TYH in Excerpt 1 made an explicit connection between Pictures 16 and 17 by referring to the boy-protagonist’s misconception. Although TYH yielded a proper rendering of 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 1 and 7 leads us to speculate a possible dissociation in the ability to provide linguistic expressions and that for inferring relations between events.

Excerpt 7: LTC (Time 3)

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 揸 著 一
個 小 男 孩 - 那 個 小 男 孩 呢 好 像 要 被 抓 走 一 樣 喔

¹⁰ 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.

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*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 1 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.¹¹ 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.

¹¹ 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.

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 1, in which the boy, TYH, 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, our 5-year-olds, at Time 3, worked at different phases while trying to interpret this sequence of events. For instance, TYH had already entered Phase 2, while LTC and most other children were still at Phase 1. Nevertheless, neither LTC nor TYH 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. 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 could not appropriately link the sequence of events and thus tended to treat the events as single, unrelated ones. On the other hand, with increasing age, some of the children began to 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, four out of the twelve 5-year-olds demonstrated a developmental progression in interpreting the target sequence of events, first as unrelated events and then as related ones. However, most of the 5-year-olds failed to link the events by addressing the causal connections between them.

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.¹² 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. Such reasoning helps to explain why, for preschoolers, the individual event is far more salient than the structurally-motivated overall plotline or the relevance of one event to the associated network of events.

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 preschoolers. Such backtracking capacities take time to develop and thus our 5-year-olds were not able to master them well. 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 preschoolers' limitations in theory of mind and linguistic encoding ability.¹³ Cognitively, the target sequence of events requires

¹² 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.

¹³ 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

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.¹⁴ In terms of Karmiloff-Smith's (1984) model for problem-solving, most of our 5-year-olds were working at Phase 1, while only four of them 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 at Phase 2. However, a child needs to enter Phase 3 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 children's relating events in a story. To simplify this study, we limited our subjects to a total of twelve children. The sample size was far too small, and hence we were able to gather only limited amount of information regarding the research topics. In addition, though this study unveiled the developmental progression in preschoolers' 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 and over a longer observation span, from which more credence will be gained.

takes several years to develop (Astington 1990, Chandler and Sokol 1999).

¹⁴ 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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漢語學齡前兒童敘事中事件的串連：由單一事件到相關事件

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本文旨在探討漢語學齡前兒童在敘事發展過程中，其串連事件能力的進展。我們以 12 位兒童為對象，自其 5;5 歲起，進行為期 6 個月的觀察。語料採樣以 *Frog, where are you?* 故事繪本為據；研究分析聚焦在該書跨第 16、17 兩頁的連續事件。研究結果發現：對敘事中的相關事件，孩童先視之為獨立的無關連事件，待其年齡稍長，才進一步詮釋為關連事件。然大多數 5 歲孩童尚無法妥善處理故事中的關連事件，亦無法適切地思索出事件間的因果關係。針對此一發展上的限制，我們以 Piaget 的認知發展理論為據加以闡述。此外，我們發現敘事中對故事整體架構與事件間關連性的處理，以及對故事細部的呈現與語彙的豐富性，此兩種能力在發展上是可分離的。針對此一觀察發現，我們試圖透過 Karmiloff-Smith 的三階段問題處理架構(Three Phase Model for Problem-Solving)來加以詮釋。