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<tr>
<th><strong>Title</strong></th>
<th>Assessing the development of narrative comprehension and production in preschool children</th>
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<tr>
<td><strong>Author(s)</strong></td>
<td>Man, Ka-yee, Feiona; 文嘉怡</td>
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<td><a href="http://hdl.handle.net/10722/192899">http://hdl.handle.net/10722/192899</a></td>
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</tbody>
</table>
Assessing the development of narrative comprehension and production

in preschool children

Man Ka Yee, Feiona

A dissertation submitted in partial fulfilment of the requirements for the Bachelor of Science (Speech and Hearing Sciences), The University of Hong Kong, June 30, 2011.
Abstract

This study aimed to develop a narrative production and comprehension assessment task for Cantonese-speaking preschool children. Children participated in the study by retelling a story, answering factual and inferential questions. In production task, syntactic complexity, conjunction, referencing and macrostructure were measured. In comprehension task, factual and inferential questions were included. The result revealed that the narrative task was generally developmentally sensitive. Syntactic complexity measure was the best measure in capturing developmental changes while conjunction measure was the least developmental sensitive. Significant developmental differences in comprehension task were found for the K1 group and the K2 group, the K1 and the K3 group but not between K2 and K3 group. Strong positive correlation between comprehension and production performance was also indicated.
Introduction

Narratives, as an ecologically valid procedure of assessment, have been used widely in both researches (Kaderavek & Sulzby, 2000; Merritt & Liles, 1987; Roth & Spekman, 1986) to discriminate children with and without language impairment. Children are exposed to narratives frequently in daily life as they are expected to share personal stories, tell fictional stories and they are being told written narratives frequently (Westerveld & Gillon, 2010). Hence, assessing language through narrative is believed to be an familiar procedure that can better reflect a child’s ability. Moreover, Liles (1993) argued that narratives offer information on whether the child can present story content logically in organized manner, and use language forms appropriately that go beyond the boundaries of individual sentences for realizing the story’s communicative function. Such information cannot be offered by assessing comprehension and production of vocabulary and isolated sentences.

Narrative ability can be examined in two modalities, which are narrative production and narrative comprehension. Narrative production is usually analyzed at two levels, namely macrostructure and microstructure. The examination of macrostructure adheres to story grammar approach (Stein & Glenn, 1979) proposing a story consist of setting and episode structures. Episode structures compose of initiating event that is a situation induces the characters for actions, attempt that is action the character taken to pursue a goal, consequence
that is the result of the attempt and reactions is emotional response of the character in the event. On the other hand, microstructure concerns structures of words and sentences to form cohesive ties of story. Prior research focused on use of conjunction that indicates semantic relations between two or more sentences (Chan, 2002), referencing that is how characters are introduced and maintained (Wong & Johnston, 2004) and syntactic complexity of sentences (Wong, 1993). While in previous studies examining narrative comprehension, factual questions and inferential questions were included (e.g. Weismer, 1985; Crais & Chapman, 1987). Factual questions assess children’s understanding and recall of details mentioned explicitly in the story while inferential questions require the use of world knowledge and problem solving. Children need to go beyond information given in the text to come up with an answer.

*Narrative development in English-speaking children*

A review of the literature on narratives suggests two general directions. One focuses on age-related advances in narrative performance while another compares narrative performance in typical developing and language-impaired children. Both narrative production ability and narrative comprehension ability were found to be age-sensitive. Older children performed better than younger children as documented in previous studies. Aged-related differences were found in the macrostructure which older children produced a higher proportion of complete episodes when compared to younger children (Roth & Spekman, 1986). On
narrative comprehension, older children scored significant higher marks than younger children in answering factual and inferential questions (Paris & Paris, 2003). Both narrative comprehension and production abilities were proved to be sensitive in distinguishing normal developing children and children with language impairment. On narrative production, language impaired children preformed worse than typically developing children in terms of microstructure like use of referencing and use of conjunctions (Liles, 1985), and macrostructure like story grammar (Roth & Spekman, 1986; Merritt & Liles, 1987). On narrative comprehension, language impaired children preformed less well in inferential questions but not factual questions (Weismer, 1985; Crais & Chapman, 1987). The above mentioned studies examined English-speaking school-aged children as participants which findings may not be applicable to Cantonese-speaking children.

*Narrative development in Cantonese-speaking children*

Due to linguistic differences, findings in English-speaking population may not be applicable to Cantonese-speaking population. Unlike English, there are no morphemes marking gender and numbers in Cantonese and nouns can be used without any modifiers. Hence, it motivated researches on narrative performances locally. On macrostructure, five-year-old children performed better than three year-old children on initiating event, attempt, consequence and internal response and improvement in setting and reaction was found when age further grows to nine (Wong, 1995). On microstructure, Wong & Johnston
(2004) investigated into referential adequacy that is ability of referring to different story characters adequately. It was found that three-year-old children seldom provided adequate referencing while twelve-year-old could always provide adequate referencing. In prior research, performance in narrative comprehension and narrative production were usually studied separately and hence relationship between them was seldom discussed.

*Narrative comprehension and narrative production*

Wagner, Sahlén & Nettelbladt (1999) conducted a study on 5-year-old language-impaired Swedish children to compare their narrative comprehension and narrative production performance. The children’s story grammar scores and comprehension scores manifested moderate positive correlation in the story retelling task without picture support but not in the telling task with picture support (Wagner, Sahlén & Nettelbladt, 1999). Wagner, Sahlén & Nettelbladt (1999) concluded that good comprehension ability was a prerequisite for the ability to produce a story with well organized story grammar in a retelling task. However, Wagner, Sahlén & Nettelbladt (1999) argued children could just mention characters and events to get story grammar marks in story telling task without comprehending their relationship. In Wagner, Sahlén & Nettelbladt’s (1999) study, performance in macrostructure was studied but not microstructure which the relationship between narrative comprehension and production was not evaluated comprehensively. Therefore, it is worthwhile to explore if relationship between narrative comprehension and production exist in Cantonese-speaking
children which may bring about insights of how to improve children narrative ability clinically.

*Clinical assessment of narrative performance in preschool children*

Given that narrative ability is a developmental sensitive (Chan, 2002; Roth & Spekman, 1986; Wong 1993) and reliable measure in identifying language impaired children, it is worthwhile to examine developmental norms in the preschool population for early identification. Paul & Smith (1993) reported delayed language development tend to persist from early preschool period to late preschool period as more than half of children with slow syntactic and morphological development at age two continued to score lower in narrative measures in re-evaluation at age four. Narrative skill was shown to be relatively essential in predicting academic outcomes in school-aged children (Feagans & Applebaum, 1986). Hence, exploring narrative ability of preschool children and developing valid narrative assessment tools are essential to help identifying children with language impairment in pre-school years. Early intervention can help to prevent children from developing into learning disabilities during school-age years.

Narratives, as an effective measure in identifying language impaired children, have been included in standardized assessments like Test of Narrative Language (TNL) and The Hong Kong Cantonese Oral Language Assessment Scale (HKCOLAS). Inclusion of comprehension questions together with retelling produces a more complete representation of a child’s ability
(Merritt & Liles, 1987). Receptive language impairment is more subtle and less explicitly shown than expressive language impairment and children with receptive language delays are easily overlooked. This brings about the importance of not only assessing narrative production but also narrative comprehension in clinical practice. At present, local standardized language assessment HKCOLAS includes textual comprehension and story retell but they are not based on the same story. Assessments for English-speaking children like TNL, narrative assessment comprehension and production are examined based on the same story which performances can be directly compared. Moreover, HKCOLAS are not suitable for local children at preschool ages with age restrictions of five to twelve years old. Given the nature of narrative is susceptible to language differences, locally developed narrative assessments would be necessary. The format of assessing both narrative comprehension and expression used in this study may be applicable clinically with further extension so that comparable tool of TNL for Cantonese-speaking children can be designed in the future.

**Purpose of the study**

The purpose of this study is to develop a narrative comprehension and production task for Cantonese-speaking preschool children. It specifically investigates into the following questions:

1. Are children’s scores on the narrative comprehension and production task develop sensitively?
a) Do their narrative comprehension and production scores correlate with ages?

b) Do older children score higher than younger children on narrative comprehension and production task?

2. Do children’s narrative comprehension and production scores correlate?

**Method**

**Participants**

Forty eight children were recruited from three kindergartens located on the Hong Kong Island, in East Kowloon and West Kowloon. They were native Cantonese speakers who had no reports of previously diagnosed speech and language problems. The children were divided into three groups according to their chronological age namely the K1 group, the K2 group and the K3 group. Information on grouping is presented in Table 1.

**Table 1. Sample size, age and gender distribution of all children**

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Boys</th>
<th>Girls</th>
<th>Mean (SD)</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>12</td>
<td>6</td>
<td>6</td>
<td>42.1 (3.40)</td>
<td>38-47</td>
</tr>
<tr>
<td>K2</td>
<td>18</td>
<td>9</td>
<td>9</td>
<td>54.4 (2.88)</td>
<td>50-59</td>
</tr>
<tr>
<td>K3</td>
<td>18</td>
<td>9</td>
<td>9</td>
<td>65.2 (3.35)</td>
<td>60-71</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>24</td>
<td>24</td>
<td>55.4 (9.61)</td>
<td>38-71</td>
</tr>
</tbody>
</table>

**Stimulus material**

‘One frog too many’ (Mayer & Mayer, 2003) was chosen from the series of frog stories and it is well-used by child language researchers world wide since the story lines are very transparent and can be easily understood from the illustrations. Fifteen pages were extracted
from the book. The illustrations tell a story about a boy going into the woods with his pets, which includes a big frog, a small frog, a dog and a turtle. The big frog makes two attempts to get rid of the little frog during the trip. The story ends with the big frog learning to accommodate the little frog. The investigator wrote a story to accompany with the wordless pictures (See appendix A for the model script). The choice of vocabulary and syntactic structures were carefully considered to suit the language development of pre-school children.

Procedure

The investigator saw the children individually in a quiet room in the kindergartens they attended. The investigator built up rapport with the children through natural conversation, each child was first asked to listen to a short trial story and retell it to the examiner. Feedback and modeling were given to make sure the children understood what the nature of comprehension and production task. Then, the wordless picture book ‘One frog too many’ (Mayer & Mayer, 2003) was shown to the children. The story script was recorded in an audio file and played to children through an earphone. The investigator introduced the task by saying ‘Now I will let you look at a story book, a girl will tell you a story. When you hear page flip sounds, you have to turn page. After listening to the story, you have to tell puppet the story.’ After listening to the story, a blindfold puppet was introduced and they were asked to retell the story with the following instruction. ‘The puppet did not listen to the story just now, its eyes were covered and it could not see the pictures, please tell him the story.’ This
aimed to create a context that only children listened to the story and the blindfold puppet was a naive listener. Referencing should be specific as children could not assume shared knowledge with the blindfold puppet. The instructions given were exactly the same with the trial story. Prompting questions ‘What happened next?’ were given if participants have limited spontaneous production. Time limitation was not imposed and all language samples were audio-recorded for analysis. Then, they were instructed to answer factual and inferential questions.

Analysis and scoring scheme

The recorded narratives and answers for comprehension were all transcribed orthographically by the investigator. Their performances were scored based on marking scheme designed especially for the assessment.

On narrative production, there were microstructure and macrostructure measures. For macrostructure, initiating event, attempt and consequence are three primary components of a complete episode (Merritt and Liles, 1987) In the story, the event episode was explicit with consistent goal which is the big frog attempts to get rid of the small frog. The children were rewarded if story grammar elements were clearly stated and fifteen marks were allocated.

Microstructure measure was further divided into measures of syntactic complexity, conjunctions and referencing. For measure of syntactic complexity and conjunctions, the marks were allocated based on the number of occurrences in the sample script and repeated
occurrences were not counted. Wong (1993) identified that usage of noun phrase expansions were stable by the age of four while verb phrase expansions emerged when children grew older. Various types of noun phrase expansions like classifier noun phrases, possessive noun phrases and relative clause while verb phrase expansions like potential complements, phase complements and manner modifiers were included. The children were rewarded if the above structures were noted in story retell and the mark allocated for syntactic complexity measure was thirty-one. Concerning use of conjunctions, developmental trend with additive and temporal conjunctions emerged first followed by the emergence of causal and adversative conjunctions after 3 and 5 years old respectively (Tse, 1997). These four types of conjunctions were included and the mark for conjunction measure was seven. Hence, the children were given higher scores with more advanced conjunctions like causal and adversative conjunctions than those with only additive and temporal conjunctions. Concerning use of reference, the story is about a boy with a big and a small frog which early development of references can be observed. Eight salient events were selected in which the children were given marks if they offered clear and unambiguous references in description of these salient events. The marks allocated for referencing was eight. Microstructure score was formed after adding marks from the three sections mentioned above and it was forty-six.

After adding the marks from microstructure score and macrostructure score, total mark for production score was sixty-one (See appendix B for detailed scoring scheme).
On narrative comprehension, five factual questions and eight inferential questions were asked. Among the inferential questions, five of them are yes/no questions. To reduce the effect of chance possibility, extra marks were rewarded for offering appropriate explanations. Fourteen marks were allocated for inferential questions. Score was given for each correct response to form comprehension score and the total mark was nineteen (See appendix C for questions and scoring scheme).

Reliability measures

The investigator reviewed half of the data after seven days to achieve intra-rater reliability. To achieve inter-rater reliability, another Year IV undergraduate of Department of Speech and Hearing Sciences was asked to re-score ten percent of data. Intra-rater reliability and inter-rater reliability were calculated by mean number of agreements over the number of disagreements plus agreements. Intra-rater reliability and inter-reliability were 96% and 92% respectively, indicating high intra-rater reliability and inter-reliability.

Results

Statistical analysis

The scores obtained in comprehension task and production task were analyzed using descriptive and inferential statistics. Pearson product-moment correlation was carried out to examine the relationship between age, narrative comprehension and narrative production. The extent of correlation was determined according to standard of Cohen (1998). To examine
any age-related differences in narrative comprehension and production, several one-way ANOVAs were also administered with age as the independent variable and narrative comprehension, microstructure performance and macrostructure performance as the dependent variables. The Tukey HSD test was chosen for as post-hoc analysis as there was unequal sample size among groups.

**Correlation between age, production scores and comprehension scores**

The correlation between age and production scores was \( r (48) = .63, p < .001 \) which results revealed a statistically significant positive, moderate correlation between them. The scatter plot in Figure 1 shows that as age increases so does production scores.

![Scatter plot of age and production scores](image)

*Figure 1. Scatter plot of age and production scores*

The correlation between age and comprehension scores was \( r (48) = .59, p < .001 \) which showed moderate positive correlation. The scatter plot in Figure 2 demonstrates that as age increases the comprehension scores increase also.
Figure 2. Scatter plot of age and comprehension scores

The correlation between comprehension score and production score were $r (48) = .82$, $p < .001$ indicating strong positive correlation. As comprehension scores and production scores were each correlated with age, partial correlation was carried out to remove effect of age. The result was $r (45) = .72$, $p < .001$ which revealed that when the variance due to age was removed, there was still strong positive correlation between comprehension performances and production performances.

Figure 3. Scatter plot of comprehension scores and production scores
Group differences in narrative performances: production

As shown in Table 2, the mean (SD) of total production score of the groups were: K1 12.08 (7.04); K2 21.72 (8.30); K3 25.06 (6.71). The K2 group performed substantially better than the K1 group and the K3 group performed moderately better than the K2 group. These differences were examined with one-way ANOVA and results indicated a main effect of age, $F(2, 45) = 11.34, p < .001$. Post-hoc analysis revealed that differences in production score between the K1 group and the K2 group ($p = .003$), the K1 group and the K3 group ($p < .001$). However, no significant difference was found between the K2 group and the K3 group ($p = .38$).

The mean (SD) of macrostructure score of the groups were: K1 4.75 (2.30); K2 7.56 (3.07); K3 7.89 (2.70). The K2 group scored essentially higher than the K1 group and the K3 group scored slightly higher than the K2 group. One-way ANOVA results exhibited a main effect of age, $F(2, 45) = 5.29, p = .009$. Statistically significant differences were found the K1 group and the K2 group ($p = .024$), the K1 group and the K3 group ($p = .01$) but not between the K2 group and the K3 group ($p = .93$).

The mean (SD) of microstructure score of the groups were: K1 7.33 (5.14); K2 14.17 (6.10); K3 17.17 (4.38). The K2 group scored essentially higher than the K1 group and the K3 group scored moderately higher than the K2 group. These differences were tested with one-way ANOVA and results indicated a main effect of age, $F(2, 45) = 12.69, p < .001$. Post-hoc
analysis confirmed that differences in the microstructure score between the K1 group and the K2 group \( (p = .003) \), the K1 group and the K3 group \( (p < .001) \) were different significantly. However, the K2 group and the K3 group did not differ significantly \( (p = .21) \).

Although no statistical significant differences were found between the K2 and the K3 group in both microstructure score and macrostructure score, microstructure score could better capture developmental changes given the smaller p-value.

Table 2. *Mean (SD) of production scores by age groups*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Microstructure (Max =46)</th>
<th>Macrostructure (Max =15)</th>
<th>Total (Max =61)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>12</td>
<td>7.33 (5.14)</td>
<td>4.75 (2.30)</td>
<td>12.08(7.04)</td>
</tr>
<tr>
<td>K2</td>
<td>18</td>
<td>14.17 (6.10)</td>
<td>7.56 (3.07)</td>
<td>21.72 (8.30)</td>
</tr>
<tr>
<td>K3</td>
<td>18</td>
<td>17.17 (4.38)</td>
<td>7.89 (2.70)</td>
<td>25.06 (6.71)</td>
</tr>
</tbody>
</table>

The components of microstructure score were examined separately and the results are displayed in Table 3. The mean (SD) of syntactic complexity score of the three groups were:

K1 5.42(2.94); K2 9.83 (3.76); K3 12.39 (3.50). The K2 group scored substantially higher than the K1 group and the K3 group scored moderately higher than the K2 group. One-way ANOVA results indicated a main effect of age, \( F = 14.51, p < .001 \). Statistically significant differences were found the K1 group and the K2 group \( (p = .004) \), the K1 group and the K3 group \( (p < .001) \) but not between the K2 group and the K3 group \( (p = .081) \).

The mean (SD) of reference score of the three groups were: K1 1.17 (1.47); K2 2.89 (2.42); K3 3.28 (1.67). The K2 group performed slightly better than the K1 group and the K3 group performed slightly better than the K1 group. One-way ANOVA results exhibited a main effect
of age, $F = 4.52, p = .016$. Statistically significant differences were found between the K1 group and the K3 group ($p = .015$) but not between the K1 group and the K2 group ($p = .056$), the K2 group and the K3 group ($p = .82$).

The mean (SD) of conjunction score of the three groups were: K1 0.75 (1.21); K2 1.44 (0.98); K3 1.50 (0.79). The K2 group performed slightly better than the K1 group and the K3 group performed slightly better than the K2 group. No significant effect of age $F = 2.46, p = .097$ was found after the administration of one-way ANOVA.

Among three component measures of microstructure score, measure of syntactic complexity was found to be the best in capturing development changes comparing to reference measure and conjunction measure. Although no statistical significant differences were found between K2 and K3 group, the p-value was .081 which was approaching significant level of 0.05.

Table 3. Mean (SD) of component measures of microstructure scores by age groups

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Syntactic complexity (Max =31)</th>
<th>Reference (Max =8)</th>
<th>Conjunction (Max =7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>12</td>
<td>5.42(2.94)</td>
<td>1.17 (1.47)</td>
<td>0.75 (1.21)</td>
</tr>
<tr>
<td>K2</td>
<td>18</td>
<td>9.83 (3.76)</td>
<td>2.89 (2.42)</td>
<td>1.44 (0.98)</td>
</tr>
<tr>
<td>K3</td>
<td>18</td>
<td>12.39 (3.50)</td>
<td>3.28 (1.67)</td>
<td>1.50 (0.79)</td>
</tr>
</tbody>
</table>

If we took a closer look at the targeted syntactic structures, diversified developmental profile was noted. Table 4 gives the number and percentage of the children using the targeted sentences structures with at least one occurrence. Except serial verb construction, there were an increasing percentage of children who produced targeted syntactic structures when age
increased. Percentage of children using manner modifier manifested steady and substantial increase across age groups. About 16% of the children from the K1 group used manner modifier for once while the percentage increased to 50% in the K2 group and 83% in the K3 group. For possessive modifier noun phase, potential complement and prepositional phase, substantial increase of percentage of children using these structures was found between the K1 group and the K2 group increase was less obvious between the K2 and the K3 group. Classifier noun phase, directional verb complement and aspect marker developed early in preschool years. Over 50% of the K1 children demonstrated use of these structures with at least one occurrence while all K3 children could make use of them. Relative clause, phase complement and clausal complement demonstrated development at later stage which only 17% to 39% of the K3 children produced at least one of these structures appropriately during story retell.

Table 4. Number (percentage) of children demonstrated appropriate use of the following structures with at least one occurrence

<table>
<thead>
<tr>
<th>Group</th>
<th>K1(n=12)</th>
<th>K2(n=18)</th>
<th>K3(n=18)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manner modifier</td>
<td>2/12(16.7%)</td>
<td>9/18(50%)</td>
<td>15/18 (83.3%)</td>
</tr>
<tr>
<td>Possessive modifier NP</td>
<td>2/12(16.7%)</td>
<td>10/18(55.6%)</td>
<td>11/18(61.1%)</td>
</tr>
<tr>
<td>Potential complement</td>
<td>5/12(41.7%)</td>
<td>10/18(55.6%)</td>
<td>10/18(55.6%)</td>
</tr>
<tr>
<td>Prepositional phrase</td>
<td>5/12(41.7%)</td>
<td>11/18(61.1%)</td>
<td>11/18(61.1%)</td>
</tr>
<tr>
<td>Classifier NP</td>
<td>7/12 (58.3%)</td>
<td>14/18(77.8%)</td>
<td>18/18(100%)</td>
</tr>
<tr>
<td>Directional Verb Complement</td>
<td>11/12(91.7%)</td>
<td>17/18 (94.4%)</td>
<td>18/18(100%)</td>
</tr>
<tr>
<td>Aspect Marker</td>
<td>9/12(75%)</td>
<td>18/18(100%)</td>
<td>18/18(100%)</td>
</tr>
<tr>
<td>Relative Clause</td>
<td>0/12(0%)</td>
<td>3/18(16.7%)</td>
<td>3/18(16.7%)</td>
</tr>
<tr>
<td>Phase complement</td>
<td>1/12(8.3%)</td>
<td>5/18(27.8%)</td>
<td>5/18(27.8%)</td>
</tr>
<tr>
<td>Clausal complement</td>
<td>0/12(0%)</td>
<td>6/18(33.3%)</td>
<td>7/18(38.9%)</td>
</tr>
<tr>
<td>Serial verb construction</td>
<td>5/12(41.7%)</td>
<td>9/18(50%)</td>
<td>7/18(38.9%)</td>
</tr>
</tbody>
</table>
Group differences in narrative performance: comprehension

Table 5 presents the raw score mean and standard deviations of total comprehension scores for all children. The mean (SD) of total comprehension score of the three groups were: K1: 6.50 (2.94); K2 9.83(2.55); K3 10.89 (2.56). The K2 group performed substantially better than the K1 group and the K3 group performed slightly better than the K2 group. These differences were tested with one-way ANOVA and results indicated a main effect of age, $F(2, 45) = 10.23, p < .001$. Post-hoc analysis confirmed that differences between the K1 group and the K2 group ($p = .004$), the K1 group and the K3 group ($p < .001$) were different significantly. However, the K2 group and the K3 group did not differ significantly ($p = .46$).

Similar results were found if we examine children’s performances in factual questions and inferential questions separately. The mean (SD) of factual score of the three groups were: K1 1.83 (0.94); K2 3.06 (1.31); K3 3.72 (1.02). The K2 group performed moderately better than the K1 group and the K3 group performed slightly better than K2 group. Results indicated a significant main effect of age, $F (2, 45) = 10.32, p < .001$. The K1 group and the K2 group ($p = .014$), the K1 group and the K3 group ($p < .001$) were different significantly. However, the K2 group and the K3 group did not differ significantly ($p = .19$). The mean (SD) of inferential score of the three groups were: K1 4.67(2.19) K2 6.78(2.16) K3 7.11 (2.37). The K2 group performed moderately better than the K1 group while the K3 group performed slightly better than K2 group. Results indicated a significant main effect of age, $F (2, 45) = 4.72, p = .014$. 
The K1 group and the K2 group ($p = .040$), the K1 group and the K3 group ($p = .015$), differed significantly. However, the K2 group and the K3 group were not ($p = .90$).

Table 5 *Mean (SD) of comprehension scores by age groups*

<table>
<thead>
<tr>
<th>Group</th>
<th>n</th>
<th>Factual (Max = 5)</th>
<th>Inferential (Max = 14)</th>
<th>Total (Max = 19)</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>12</td>
<td>1.83 (0.94)</td>
<td>4.67 (2.19)</td>
<td>6.50 (2.94)</td>
</tr>
<tr>
<td>K2</td>
<td>18</td>
<td>3.06 (1.31)</td>
<td>6.78 (2.16)</td>
<td>9.83 (2.55)</td>
</tr>
<tr>
<td>K3</td>
<td>18</td>
<td>3.72 (1.02)</td>
<td>7.11 (2.37)</td>
<td>10.89 (2.56)</td>
</tr>
</tbody>
</table>

**Discussion**

One may question the appropriateness of assessment used in this study for assessing the children’s language ability given the low marks attained by children. The children’s story transcripts were reviewed; it was found that most of them could clearly state the main story line which was the big frog would like to get rid of the small frog. (See Appendix D for typical story transcripts from each age group) Therefore, it was believed the level of the story suit preschool children. The production scoring scheme was formed based on the model story told to the children. During retell, there was no obligatory context for children to mention every detail and use targeted sentence structures. Children were free to retell the story in their own way and hence it may explain the phenomenon of low average marks.

The narrative assessment used in this study, including comprehension and production task, were generally developmentally sensitive for children aged three to five. In the following section, the relationship between comprehension scores and productions will be first discussed. Then, children’s performances will be interpreted with ages too see why older
children performed better than younger children. Moreover, modifications of the assessment on how to better capture language development of preschool children will be discussed.

*The relationship between narrative comprehension and production*

After removal of age effect, strong positive correlation between comprehension and production scores was found. This extended on finding of Wagner, Sahlén & Nettelbladt’s (1999) study that not only comprehension scores and story grammar scores positively correlated but the comprehension scores and production scores including microstructure and macrostructure manifested strong positive correlation. Comprehension first involved interpretation of heard information and integration with past knowledge and then forming coherent pictures in children’s mind; it helped to create a mental framework which was a foundation for story retelling (van den Broek et al., 2005). For information not integrated to the mental framework was more fragile and not long-lasting (Bishop, 1997), hence children with poorer comprehension were less able to recall details of story in retell, this adversely affected scores obtained in macrostructure and microstructure like referencing.

*Using narratives to assess language production*

The total production scores manifested age-related increases across the three age groups. However, the amount of increase was not statistically significant between the K2 group and the K3 group. Large standard deviations were observed for the K2 group and the K3 group. Given the relative small sample size, difference among the K2 group and the K3 group was
comprised by large within-group variances. It is probable to find age-related differences in at least some of the measures like syntactic complexity measures if more children were recruited.

Macrostructure measure could be a potentially appropriate measure in distinguishing aged-related progress. There were significant aged-related progresses among the K1 group and the K2 group, the K1 group and the K3 group but not between the K2 and the K3 group. The result was compatible with Wong’s (1995) study which proposed that five-year-old children performed better than three-year-old ones in basic elements of macrostructure of forming complete episode. Complete episodes include initiating event, attempt and consequence. The story transcripts from the K1 group were organized in a scatter manner that attempt and consequence were missed usually. However, more children from the K3 group were able to include the three basic elements in forming complete episodes. Since older children had more literacy exposure, they tend to have more knowledge of story grammar framework.

Among the four measures within productions scores, syntactic complexity was identified as the most promising measure in capturing developmental changes. The group means of the syntactic complexity scores increased constantly across three groups: K1 group (mean= 5.42), K2 group (mean= 9.83) and K3 group (mean=12.39). Generally, there were increases in percentages of children using most targeted sentence structures as ages increase. As
mentioned earlier, the syntactic structures included in the assessment had various developmental profiles in preschool age range. With inclusion of structures acquired at different ages, older children or children with better language proficiency could be rewarded marks for more advanced structures like relative clauses, phase complements and clausal complements. This helped to create discrepancy of marks across groups and hence it was proved to be age sensitive.

Measure of reference scores could identify developmental progress across the K1 group and the K3 group while adjacent group differences were not noticed. Among eight instances of scoring referential adequacy, the K1 group demonstrated an average mean of 1.17 instances with sufficient referential adequacy. This was consistent with Wong & Johnston’s (2004) finding that three-year-old children seldom provided clear references for characters in story and more adequate reference was noted for older children. Extensive use of general pronouns like ‘keoi’ reflected that the children had the tendency of presuming prior knowledge of the listeners. Moreover, developing presuppositional skills might be compromised during narratives which needed high cognitive and linguistic demand on preschool children (Wong & Johnston, 2004).

Comparing to other measures, measure of conjunctions was less able to demonstrate age differences. Statistical significant differences were not observed among the three groups. This confirmed with Chan’s (2002) study that no significant main effect of age on density of
conjunction was found among K1, K2 and K3 children in story retelling task. Hudson & Shapiro (1991) proposed that less effort could be spared for achieving cohesion if much cognitive effort had been used to achieve coherent story line. For preschool children, they spent much cognitive effort in achieving coherence given that macrostructure was not fully mastered; children were less able to make use of conjunctions during story retelling. Hence, age related improvement cannot be seen in terms of conjunction.

Using narratives to assess language comprehension

The comprehension score measure was powerful in differentiating the K1 group from the K2 group and the K3 group. However, the amount of increase was not substantial between the K2 group and the K3 group. The group means of the comprehension scores increased steadily from the K1 group (mean= 6.50) to the K2 group (mean= 9.83), but the increase was less obvious in the K3 group (mean= 10.89). Similar findings were noted when children’s performances in factual and inferential questions were examined respectively.

The findings suggested age related progress in answering factual questions. The group means of the factual scores increased moderately from the K1 group (mean=1.83) to the K2 group (mean= 3.06), but the increase was less obvious in the K3 group (mean=3.72). van den Broek et al. (2005) suggested that comprehension ability depended on efficiency and content of processing. Increased experiences in using cognitive processes needed for comprehension like attention and working memory capacities allowed older children to make use of them
more efficiently (van den Broek et al., 2005). It is expected that efficient use of attention and working memory capacities could help to retain more details in story. This explained why older children could recall more details accurately when being asked. Hence, older children performed better in factual questions when compared to younger children.

Developmental changes among age groups were noted that older children scored higher in inferential questions. The group means of the inferential scores increased from the K1 group (mean=4.67) to the K2 group (mean=6.78), but the increase leveled off in the K3 group (mean=7.11). To be able to infer, children should first have basic understanding of literal meaning of what they heard, then they needed to activate world knowledge and used it make interpretations of what was being said (van Kleeck, 2008) Take one of the inferential questions included as an example, the children was asked about whether father’s shoes fit the boy or not and they had to offer an explanation. Children should have the knowledge that size of shoes for father and the boy are different and so the boy cannot fit into father’s shoes. As older children had higher accumulation of experience and background knowledge about the world when compared to younger children, hence the content they could make use of to assist comprehension increased (van den Broek et al., 2005). This explained why older children performed better in inferential questions of this assessment. van den Broek et al. (2005) proposed that children by four should be able to make casual inferences and interpret meaningful relations among sentences. This went along with the result that the three-year-old
K1 group showed unsatisfactory performance in inferential questions. Although children by four could infer, it was believed this skills continue to develop in school age and therefore no significant differences could be observed between the adjacent K2 group and the K3 group.

Implications for further research

Possibility of using the present narrative protocol to assess narrative performances of children from primary one was indicated since no ceiling effect was noted even for the K3 group.

Within measures of narrative production, conjunction measure was less able to demonstrate age-related progress in preschool years. Hence it can be excluded if narrative assessment for preschool children is to be developed in the future.

Within the total comprehension score (19 marks), a large share of the marks (14 marks) was allocated to inferential questions. After the children’s initial yes/no responses, they were required to give explanations. Most children, especially those in the K1 group failed to offer appropriate explanations even they answered yes/no questions correctly. As discussed earlier, preschool children are developing inferencing skills and therefore it was challenging to them if explanations were required. To better suit the developmental level of preschooler, the number of factual and inferential questions can be adjusted to a more equal proportion. The inferential questions comprised in the assessment mainly required activation of world knowledge, more types of inferential questions can be included. A possible option would be to include story
goal inference questions that tap on children’s inferences of the story goal that is their ability
to predict what a character will do next. Actually, asking such kind of questions is a usual
practice when parents and teachers tell children stories. Therefore, it is believed that preschool
children can perform better due to familiarity.

Conclusion

The narrative production and comprehension assessment task developed for this study was
demonstrated to be age sensitive for preschool children generally. Measure of syntactic
complexity was the most promising measure in capturing age differences.

This study was the first step in the process of developing a valid and reliable narrative
assessment task for Cantonese-speaking children at preschool age. Further investigation might
consider amendments on measures included and mark allocation. With adjustments after
further study, the task can be clinically useful for language assessment.

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Appendix A: Model script of the story

从前，有一个男仔，
cung4 cin4, jau5 jat1 go3 nam4 zai2
‘Once upon a time, there was a boy.’

佢有一隻狗，一隻乌龟同埋两隻青蛙
keoi5 jau5 jat1 zek3 gau2, jat1 zek3 wu1 gwai4 tung4 maai4 loeng5 zek3 cing1 waal
‘He had a dog, a tortoise and two frogs.’

有一日，佢地一齊去河邊玩
jau5 jat1 jat6, keoi5 dei6 jat1 zai6 hoei3 ho4 bin1 waan4
‘One day, they played by the riverside together.’

男仔行先，狗仔跟住佢
nam4 zai2 haang4 sin1, gau2 zai2 gan1 zyu6 keoi5
‘The boy went first, the dog followed him.’

大青蛙同埋细青蛙坐喺乌龟个背脊上面，佢地行最後
daai6 cing1 waal tung4 maai4 sai3 cing1 waal co5 hai2 wu1 gwai4 go3 bui3 zek3 soeng6
min6, keoi5 dei6 haang4 zoi3 hau6
‘The big frog and the little frog sat on back of the tortoise, they were at the back.’

男仔带咗一把剑，同埋一顶纸造既帽，脚上仲著住爸爸对水靴添
nam4 zai2 daai3 zo2 jat1 baa2 gim3, tung4 maai4 jat1 deng2 zi2 zou6 ge2 mou6,
goei3 soeng6 zung6 zoei6 zyu3 baa1 baa1 doei3 seoi2 hoei1 tim1
‘The boy brought a sword, and wore a hat made of paper; he also put on his dad’s rain boots.’

睇下佢地个样
tai2 haa5 keoi5 dei6 go3 joeng6
‘Look at their faces.’

突然间，大青蛙就好大力咁踢咗细青蛙一下
dat6 jin4 gaan1, daai6 cing1 waal zau5 hou2 daai6 lik6 gam3 tek3 zo2 sai3 cing1 waal jat1 haa5
‘Suddenly, the big frog kicked the little frog with great force.’
哎呀
‘aai1jaa1’
‘Oh!’

細青蛙跌咗落地下，仲喊起上黎
sai3 cing1 waa1 dit3 zo2 lok6 dei6 haa5, zung6 haam3 hei2 soeng5 lai4
‘The little frog fell on the ground, he started to cry.’

因為大青蛙呅曳
jan1 wai6 daai6 cing1 waa1 gam3 jai5
‘As the big frog did not behave.’

所以男仔就叫佢自己留喺岸上面
so2 ji5 nam4 zai2 zau5 giu3 keoi5 zi6 get2 lau4 hai2 ngon6 soeng6 min6
‘So the boy asked it to stay on the shore on its own.’

大青蛙唔可以同大家一齊過河
daai6 cing1 waa1 m4 ho2 ji5 tung4 daai6 gaa1 jat1 zai6 gwo3 ho4
‘The big frog could not cross river with them.’

睇下，但係大青蛙唔聽話，佢跳上船度
tai2 haa5,daan6 hai6 daai6 cing1 waa1 m4 teng1 waa6, keoi5 tiu3 soeng5 syun4 dou6
‘Look! The big frog did not follow the boy’s instruction, it jumped on the boat.’

仲好大力咁踢咗細青蛙一下
zung6 hou2 daai6 lik6 gam3 tek3 zo2 sai3 cing1 waa1 jat1 haa5
‘And it kicked the little frog with great force.’

細青蛙嘟一聲咁跌咗落河度
sai3 cing1 waa1 du4 jat1 seng1 gam3 dit3 zo2 lok6 ho4 dou6
‘Splash! The little frog fell into the river.’

之後就唔見咗啦
zil hau6 zau5 m4 gin3 zo5 laa1
‘And then disappeared afterwards.’
男仔，狗仔同烏龜周圍搵細青蛙，仲一路搵
nam4 zai2, gau2 zai2 tung4 wu1 gwai1 sei3 zau1 wai4 gam3 wan5 sai3 cing1 waa1, zung6 jat1 lou6 wan5
‘The boy, the dog and the tortoise searched for the little frog everywhere.’

一路哎‘細青蛙，細青蛙，你喺邊啊?’
jat1 lou6 aai1 'sai3 cing1 waa1, sai3 cing1 waa1, nei5 hai2 bin1 aa1?’
‘While they were searching, they yelled ‘little frog, little frog, where are you?’

佢地搵咗好耐, 都搵唔到細青蛙
keoi5 dei6 wan5 zo2 hou2 noi6, dou1 wan5 m4 dou3 sai3 cing1 waa1
‘They searched for a long time but still could not find the little frog.’

男仔諗起細青蛙，就喊起上黎
nam4 zai2 lam5 hei2 sai3 cing1 waa1, zau5 haam3 hei2 soeng5 lai4
‘The boy thought of the little frog and cried.’

因為天黑啦，所以佢地要番屋企訓覺
jan1 wai6 tin1 hai1 laa1, so2 ji5 keoi5 dei6 jiu3 faan1 uk1 kei5 fan3 gaau3
‘Since it was night-time, they had to go back home and sleep.’

番到屋企之後
faan1 dou3 uk1 kei5 zil hau6
‘After arriving at home.’

突然間，細青蛙由窗外面跳入黎
dat6 jin4 gaan1, sai3 cing1 waa1 jau4 coeng1 ngoi6 min6 tiu3 jap6 lai4
‘They suddenly saw the little frog jumped in through a window.’

仲嘟一聲咁跳喺咁大青蛙個頭上面
zung6 du4 jat1 gam3 tiu3 zo2 hai2 daai6 cing1 waa1 go3 tau4 soeng6 min6
‘Bosh! It then jumped on the head of the big frog.’

大家見到細青蛙番黎，就開心番啦
dou3 sai3 cing1 waa1 fan3 zo2 lai4, zau5 ho11 sam1 fan3 laa1
‘They were so happy when they saw the little frog was back.’
Appendix B: Scoring scheme for story retell (total: 61 marks)

**Microstructure-Syntactic complexity (31 marks)**

| Classifier | 有一個男仔  
|            | 佢帶咗一把木劍，一頂報紙造既帽  
|            | 佢有一隻狗，一隻烏龜同埋兩隻青蛙  
|            | 腳上仲著住爸爸對水靴添  
|            | 大青蛙同埋細青蛙坐係烏龜個背脊上面  
|            | 仲嘟一聲咁跳咁係大青蛙個頭上面  
|            | Max: 5 marks  
|            | *Repeated classifiers will not be counted.  

| Possessive modifier | 大青蛙同埋細青蛙坐係烏龜個背脊上面  
|                     | 同埋著住爸爸對水靴添  
|                     | 仲嘟一聲咁跳咁係大青蛙個頭上面  
|                     | Max: 3 marks  

| Relative Clause | 同埋一頂紙造既帽  
|                | Max: 1 mark  

| Verb phrase expansion | 返到屋企之後  
|                       | 大家見到細青蛙返咗黎  
|                       | Max: 1 marks  
|                       | *Repeated phase complement will not be counted.  

| Potential complement | 都搵唔到細青蛙  
|                      | Max: 1 marks  

| Directional Verb Complement | 細青蛙跌咗落地下  
|                            | 仲跳上船度  
|                            | 細青蛙嘅一聲咁跌咗落河度  
|                            | 細青蛙由窗外面跳入黎  
|                            | Max: 3 marks  

| Aspect Marker | 男仔帶咗一把木劍同埋一頂報紙造既帽  
|              | 腳上仲著住爸爸對水靴添  
|              | 睇下佢地個樣  
|              | 大青蛙就好大力咁踢咗細青蛙一下  
|              | 細青蛙跌咗落地下  
|              | 仲喊起上黎  
|              | 仲好大力咁踢細青蛙一下  

| Noun phrase expansion | Max: 5 marks  
|                       | *Repeated classifiers will not be counted.  

| Possessive modifier | Max: 3 marks  
| Relative Clause | Max: 1 mark  
| Verb phrase expansion | Max: 1 marks  
| Potential complement | Max: 1 marks  
| Directional Verb Complement | Max: 3 marks  
| Aspect Marker | Max: 5 marks  

*Repeated classifiers will not be counted.*
之後就唔見咗啦
就喊起上黎
大家見到細青蛙返咗黎
Max: 4 marks
*Repeated aspect markers will not be counted.
*緊 will be accepted

Clausal complement
個男仔叫佢自己留係岸上面
大家見到細青蛙返咗黎
Max: 2 marks

Manner modifier
佢地一齊去河邊玩
大青蛙唔可以同大家一齊過河
大青蛙就好大力咁踢細青蛙一下
仲好大力咁踢細青蛙一下
男仔,狗仔同烏龜周圍咁搵細青蛙
細青蛙嘟一聲咁跌落河度
仲嘟一聲咁跳細青蛙個頭上面
Max: 4 marks
*Repeated manner modifiers will not be counted.

Sentence structure
佢地一齊去河邊玩
佢地要返屋企訓覺
Max: 2 marks

Prepositional phrase
大青蛙同埋細青蛙坐烏龜個背脊上面
所以男仔就叫佢自己留係岸上面
大青蛙唔可以同大家一齊過河
細青蛙由窗外面跳入黎
仲嘟一聲跳係大青蛙個頭上面
Max: 5 marks

Microstructure-Referencing (8 marks)
Instances that reference must be marked clearly
有一個男仔，佢有一隻狗，一隻烏龜同埋兩隻青蛙
大青蛙就好大力咁踢細青蛙一下(任何实例将被接受)
細青蛙跌咗落地下/細青蛙嘔
男仔就叫佢自己留係岸上面
大青蛙唔聽話，仲跳上船度。
男仔喊起上黎
細青蛙由窗外面跳入黎
跳咗係大青蛙個頭上面
### Microstructure-Conjunctions (7 marks)

<table>
<thead>
<tr>
<th>Types</th>
<th>Examples</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Coordinative/Additive</strong></td>
<td>併有一隻狗, 一隻烏龜[同埋]兩隻青蛙</td>
</tr>
<tr>
<td></td>
<td>大青蛙[同埋]細青蛙坐係烏龜個背脊上面</td>
</tr>
<tr>
<td></td>
<td>腳上[仲]著住爸爸對水靴添</td>
</tr>
<tr>
<td></td>
<td>細青蛙跌咗落地,[仲]喊起上黎。</td>
</tr>
<tr>
<td></td>
<td>[仲]跳上船度</td>
</tr>
<tr>
<td></td>
<td>[仲]奬大力咁踢咗細青蛙一下</td>
</tr>
<tr>
<td></td>
<td>男仔，狗仔[同]烏龜四周圍咗揈細青蛙</td>
</tr>
<tr>
<td></td>
<td>[仲]嘟一聲咁起係大青蛙個頭上面，</td>
</tr>
<tr>
<td>Max: 3 marks</td>
<td>*‘又’ will be accepted if use appropriately</td>
</tr>
<tr>
<td></td>
<td>*Repeated conjunctions will not be counted.</td>
</tr>
<tr>
<td><strong>Temporal</strong></td>
<td>之後就唔見咗啦</td>
</tr>
<tr>
<td></td>
<td>返到屋企之後</td>
</tr>
<tr>
<td>Max: 1 mark</td>
<td></td>
</tr>
<tr>
<td><strong>Adversative</strong></td>
<td>併大青蛙唔聽話</td>
</tr>
<tr>
<td>Max: 1 mark</td>
<td></td>
</tr>
<tr>
<td><strong>Casual</strong></td>
<td>因為隻大青蛙咁曳</td>
</tr>
<tr>
<td></td>
<td>所以男仔就叫佢自己留係岸上面</td>
</tr>
<tr>
<td></td>
<td>因為天黑啦</td>
</tr>
<tr>
<td></td>
<td>所以佢地要番屋企訓覺</td>
</tr>
<tr>
<td>Max: 2 mark</td>
<td></td>
</tr>
</tbody>
</table>
Macrostructure (15 marks)
*mark will be given if bolded words present

Character 1
有一個男仔，佢有一隻狗，一隻烏龜同埋兩隻青蛙。

Setting 1
佢地一齊去河邊玩
Initiating event 1
大青蛙踢細青蛙一下
Consequence 1
細青蛙跌咗落地下
Reaction 1
細青蛙喊起上黎
Consequence 2
大青蛙要留係岸上面 /大青蛙唔可以同大家一齊過河

Setting 2
仲跳上船度
Initiating event 2
大青蛙踢細青蛙一下
Consequence 3
細青蛙跌落河度/之後就唔見咗啦
Attempt 1
男仔，狗仔同烏龜四周圍搵細青蛙
Consequence 4
佢地搵咗好耐都搵唔到細青蛙
Reaction 2
男仔諗起細青蛙，就喊起上黎

Setting 3
返到屋企之後
Consequence 5
細青蛙係窗外面跳入黎 / 細青蛙跳係大青蛙個頭上面
Reaction 3
大家見到細青蛙返咗黎，就開心番啦
Appendix C: Comprehension questions and scoring scheme ~ Cantonese version
(Total: 19 marks)

Factual questions (5 marks)
1. 男仔，狗，烏龜同埋青蛙去咗邊度玩？（河邊/河）
2. 男仔戴既帽用咩做架？（報紙/紙）
3. 大青蛙同細青蛙坐係邊個背脊上面？（烏龜）
4. 點解男仔佢地要返屋企？（因為天黑/要訓覺）
5. 細青蛙由邊度跳返入屋企？（窗外）

Inferential questions (14 marks: 1 mark for each except* 2 marks for each)
1. 去河邊個陣，邊個行中間？（狗仔）
2. 烏龜點解行最後？（佢行得慢/佢俾青蛙坐住）
3. 去河邊個陣，邊個唔開心？（大青蛙）
4. 爸爸對水靴唔啱男仔著？（唔啱）
   *你點知架？（因為爸爸對水靴太大/因為男仔腳太細--2）
   （因為大人著架/因為男仔細--1）
5. 摸唔到細青蛙，狗仔冇冇喊？（冇）
   你點知架？（得男仔喊/狗仔嬲）
6. 男仔屋企有冇刪窗？（冇）
   點解你知道？（因為細青蛙跳到入黎）
7. 大青蛙最後冇冇返到屋企？（冇）
   點解你知道？（細青蛙跳咗係大青蛙個頭上面 /
   因為睇到大青蛙己經係屋企）
8. 大青蛙鍾唔鍾意細青蛙？（鍾意/
   唔鍾意）
   點解你知道？（因為最後做好朋友/
   因為大青蛙踢細青蛙/第一頁見大青蛙好鬨）
Appendix C: Comprehension questions and scoring scheme ~ English version
(Total: 19 marks)

Factual questions (5 marks)
1. Where did the boy, the dog, the tortoise and the frogs go to play? (Riverside/river)
2. What was the boy’s hat made of? (Newspaper/paper)
3. On where did the big frog and the little frog sit? (The tortoise’s back)
4. Why did the boys and his pet have to go back home? (Because it’s night-time/
   Because they had to sleep)
5. Through where did the little frog jump into home? (Window)

Inferential questions (14 marks: 1 mark for each except* 2 marks for each)
1. When they went to riverside, who was in the middle? (The dog)
2. Why was the tortoise stayed at the back when they walked to riverside?
   (Because he walked very slowly /
   Because the two frogs were sitting on its back)
3. Who was unhappy when they went to riverside? (The big frog)
4. Could the boy fit into daddy’s rain boot? (No)
   *How do you know? (Because daddy’s rain boots were too big/
   Because the boy’s feet were too small--2)
5. Did the dog cry when they could not find the little frog? (No)
   How do you know? (Because the dog was angry/
   Because only the boy cried)
6. Were the windows closed at the boy’s home? (No)
   How do you know? (Because the little frog could jump into the house through window)
7. Did the big frog go back home finally? (Yes)
   How do you know? (Because the little frog jumped onto the big frog’s head/
   Because the big frog was already at home before the little frog came back)
8. Did the big frog like the little frog? (Yes/No)
   How do you know? (They became friends at last/
   Because the big frog kicked the little frog/
   Because the big frog was so angry, as indicated on the first page)
Appendix D: Typical story transcripts from each age group

K1 girl (Age: 38 months)

跟住個狗
gan1 zyu6 go3 gau2
‘Followed the dog.’

跟住個男仔
gan1 zyu6 go3 nam4 zai2
‘Followed the boy.’

大個青蛙踢落水
daai6 go3 cing1 waa1 tek3 lok6 soei2
‘The big frog kicked (somebody) into the water.’

喊呀
haam3 aa1
‘Cried.’

留嚮度
lau4 hoeng5 dou6
‘Stayed here.’

跳落去
tiu3 lok6 hoei3
‘Jumped down.’

個個都話踢落水
go3 go3 dou1 wa1 tek3 lok6 soei2
‘Everybody said kicked (somebody) into the water’
睇都睇唔到
tai2 dou1 tai2 m4 dou6
‘Could not see.’

青蛙喺最後嘅度
cing1 waa1 hai2 zoei3 hau6 go5 dou6
‘The frog stayed at the back.’

搵極都搵唔到佢
wan5 gik6 dou1 wan5 m4 dou6 keoi5
‘Could not found it.’

佢就喊
keoi5 zau6 haam3
‘He cried.’

然之後喺窗口度跳落去
jin4 zil hau6 hai2 coeng1 hau2 dou6 tiu3 lok6 hoei3
‘Then jumped down from the window.’

跟住好開心
gan1 zyu6 hou2 hoi1 sam1
‘Then so happy.’
大青蛙同細青蛙跟住佢行
daai6 cing1 waal tung4 sai3 cing1 waa1 gan1 zyu6 keoi5 haang4
‘The big frog and the little frog.’

跟住佢就踢佢一下
gan1 zyu6 keoi5 zau6 tek3 keoi5 jat1 haa5
‘Then it kicked it.’

跌咗落地，仲喊
dit3 zo2 lok6 dei6, zung6 haam3
‘Fell on the ground and cried.’

跟住個男仔知道
gan1 zyu6 go3 nam4 zai2 zi2 dou6
‘Then the boy knew.’

佢就叫佢唔好跟住佢
keoi5 zau6 giu3 keoi5 m4 hou2 gan1 zyu6 keoi5
‘He asked it not to follow him.’

佢又唔聽話，佢跳咗上船度
keoi5 jau5 m4 teng1 waa6, keoi5 tiu3 zo2 soeng5 syun4 dou6
‘It did not follow instruction, it jumped on the boat.’

佢就踢佢一下
keoi5 zau6 tek3 keoi5 jat1 haa5
‘Then it kicked it.’
跌咗落河邊度

dit3 zo2 lok6 ho4 bin1 dou6
‘Fell on the riverside.’

跟住佢就唔見咗

gan1 zyu6 keoi5 zau6 m4 gin3 zo2
‘Then it disappeared.’

一路搵，一路叫

jat1 lou6 wan5，jat1 lou6 giu3
‘Yelled when finding.’

佢天黑，佢返屋企訓覺

keoi5 tin1 hak1，keoi5 faan1 uk1 kei5 fan3 gaau3
‘It was night-time, they went back home to sleep.’

跟住細青蛙就喺窗度跳番入黎

gan1 zyu6 sai3 cing1 waa1 zau6 hai2 coeng1 dou6 tiu3 faan1 jap6 lai4
‘Then the little frog jumped in through the window.’

全部人都開心番

cyun4 bou6 jan4 dou1 hoi1sam1 faan1
‘Everybody was happy.’
Once upon a time, there was a little tortoise and a boy and a dog walked together.

Also put on his dad’s rain shoes (boots).

Then a big frog and a little frog rode on back of the tortoise.

Then the big frog kicked the little frog with great force.

Then a boy said it was too naughty.

Then he asked it to stay here on its own.

I and other friends crossed the river here.

Then the big frog did not follow instruction.

Then the big frog kicked it again.
跟住佢又跌咗落河
`gan1 zyu6 keoi5 jau5 dit3 zo2 lok6 ho4`
‘Then it again fell into the river.’

跟住男仔喺度搵佢，搵極都搵唔到
`gan1 zyu6 nam4 zai2 hai2 dou6 wan5 keoi5, wan5 gik6 dou1 wan5 m4 dou6`
‘Then the boy searched for it but could not found it.’

跟住男仔喊
`gan1 zyu6 nam4 zai2 haam3`
‘Then the boy cried.’

跟住天黑啦
`gan1 zyu6 tin1 hak1 laa1`
‘Then it was night-time already.’

跟住夜晚訓覺時候
`gan1 zyu6 je6 maan5 fan3 gaau3 si4 hau6`
‘Then when they slept.’

跟住又見到細青蛙
`gan1 zyu6 jau5 gin3 dou6 sai3 cing1 waa1`
‘Then they saw the little frog again.’

跟住細青蛙坐喺大青蛙個頭上面
`gan1 zyu6 sai3 cing1 waa1 co5 hai2 daai6 cing1 waa1 go3 tau4 soeng6 min6`
Then the little frog sat on the head of the big frog

跟住以後做咗好朋友
`gan1 zyu6 ji5 hau6 zo2 hou2 pang4 jau5`
‘Then they became friends afterwards.’
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