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Word learning in a storytelling context  
by Cantonese children with a history of language impairment

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### Abstract

This study examined the effect of the elaboration of meanings on the comprehension of novel words by children with a history of language impairment. Twelve Cantonese children aged from 4;03 to 6;01 with a history of language impairment listened to four novel action words and four novel object words embedded in two stories. Elaboration of meanings of these novel words were given to half of these children. The children were then assessed on their comprehension of these novel words both immediately after the storytelling and one week after the storytelling. Statistical results revealed that in the first testing, the main effect of word type and the main effect of storytelling condition were approaching significance, indicating that children learned object words better than action words, and children who were given elaboration of meanings learned the novel words better than children who were not. Learning and retention of the novel words in a storytelling context were also supported as the majority of children received higher-than-chance-level scores.

## Word learning in a storytelling context

by Cantonese children with a history of language impairment

Children learn new words at an amazingly rapid pace. It is estimated that children acquire 8000 root words of English in their first six years of life (Templin, 1957). Clearly this huge amount of words could not all be learned through direct teaching. Rather researchers (e.g., Penno, Wilkinson, & Moore, 2002; Justice, Meier, & Walpore, 2005) proposed that children would have acquired the words through incidental learning. Werner and Kaplan (1950) defined incidental learning as a learning condition in which “novel words are not explicitly introduced or otherwise taught to children... Rather, children apparently utilize contextual cues embedded within the encounters to independently acquire receptive and expressive knowledge of novel words”. Robbins and Ehri (1994) pointed out that word learning could take place incidentally when children are listening to conversations, watching television, or participated in a shared bookreading activity. Until now, whether direct teaching or incidental learning is more effective in helping children to acquire new words is still under vigorous debates (e.g., Jenkins, Matlock, & Slocum, 1989; Oetting, Rice, & Swank, 1995). Nevertheless, as it was proposed that children learned most of their early words through incidental learning from context (Penno et al., 2002), it is still worth the effort to investigate how language input in incidental learning contexts can be modified to maximize children’s word learning. It is particularly important to identify input variables that will facilitate word learning of children with language impairment to inform therapeutic decisions.

Several input variables have been demonstrated to influence word learning under incidental contexts. One input would be the type of the words learnt (e.g., object words and action words) (Leonard, Schwartz, Chapman, Prelock, Terrel, Weiss, & Messick, 1982; Rice & Woodsmall, 1988). Most of these studies demonstrated that children generally found it easier to acquire object words than action words under incidental contexts. Gentner (1982)

attributed this predominance of object words over action words to the fact that objects were more concrete and more available for children to perceive than actions, and that “relational and causative meanings of verbs are less accessible to children”. Gentner (1978) proposed that both the structure of verb meaning and the structure of noun meaning could be separated into component subpredicates. For example, in order to understand the meaning of the verb “give”, children would need to figure out the person who initiates the “giving” event, the change of the possessor before and after the event, and the object involved. As verbs were usually used to express relational meanings and nouns were often used to refer to concrete objects, “the component of verb meanings are more separable from one another than those of noun meaning” (pp. 990) and this separation of component subpredicates make the acquisition of verb meanings harder for children. Also, as action words are marked for grammatical information (e.g., tense, aspect, and agreement), researchers (e.g., Rice & Oetting, 1994) believed that it makes them more difficult for children to acquire. However, since grammatical information is not marked on the action words in Cantonese, this latter factor may not play as important a role in Cantonese as in English.

Another variable involves the style of parental input. Research (e.g., Brett, Rothlein, & Hurley, 1996; Elley, 1989; Justice, Meier, & Walpole, 2005; Penno, Wilkinson, & Moore, 2002) has shown that elaboration of the meanings of the novel words during storytelling aids children’s word comprehension. According to Gupta (2005), in order to comprehend a word, the child has to build a phonological word form representation and a semantic representation for the word, and a link between the word form representation and the semantic representation. Gupta (2005) also indicated that the link between the word form and its semantic representation could be strengthened by providing a rich semantic context and sufficient contextual cues to the child. As a result, it can be inferred that elaboration of the meanings, which provides more semantic information for the newly learned word, would

facilitate comprehension by strengthening the link between the word form and the semantic representation.

However, previous studies about word learning in a storytelling context mostly included participants in small groups (Brett et al., 1996; Elley, 1989; Penno et al., 2002), and most of them recruited typically developing children as participants. It is still uncertain whether elaboration of meanings is useful for children with a history of language impairment when learning new words.

#### The present study

In this study, storytelling context was selected as the incidental learning context under investigation, and this study investigated word learning in Cantonese children with a history of language impairment. The study extends the effort of previous studies by recruiting children with a history of language impairment as participants, by using different word types (action words and object words) as stimuli, and by investigating the effects of the elaboration of meanings on the comprehension of novel words. To be specific, this study addresses the following questions: (a) whether elaboration of the meanings of the novel words facilitates their comprehension, (b) whether children comprehend novel object words better than novel action words in a story context, (c) whether there is an interaction effect between the type of words (object words and action words) and the storytelling conditions (with elaboration and no elaboration), and (d) how well the children can retain learned novel words after one week.

Previous reviews reported that the elaboration of meanings would aid children in their comprehension of new words. Although children with language impairment learned at a slower rate than typically developing children, they generally learned in the same way as typically developing children did. As a result, it was hypothesized that (a) the elaboration of meanings would facilitate the comprehension of words in children with a history of language impairment. Secondly, given the differences in the nature of object words and action words as

discussed earlier, it was hypothesized that (b) children would comprehend object words better than action words in a storytelling context. Thirdly, it was mentioned that the components of verb meanings are more separable than noun meanings, and that makes it difficult for children to acquire verb meanings (Gentner, 1978). As the elaboration of meanings provides children with the big picture of the meaning of the verbs and it helps to integrate the separated components of the verb meanings together, it was hypothesized that (c) elaboration of meanings would facilitate the learning of action word more than the learning of object word. Finally, (d) children should be able to retain learned materials after one week.

## Method

### *Participants*

Participants for this study were recruited with the support of the Speech Therapist at the Haven of Hope K.C. Liang Po Lam Early Education and Training Centre (EETC). Preschool children who were previously diagnosed as having a language impairment by qualified speech therapists and are currently receiving language therapy at the Centre, who had no known history of hearing impairment, and who were able to comprehend and produce a few sentences on a picture were invited to participate. Given the time frame for this dissertation study, assent was obtained from the parents of 14 children. To ensure that these children could attend to storytelling activities and show adequate story comprehension skills for the purpose of this study, the author assessed them with the “Five Dollars Story” (Wong, 2004). The children had to answer at least three out of four factual questions correctly in order to pass the screening. Two of the children failed the story screening and were hence excluded from further participation in this study. Appendix A gives detailed demographic information of the remaining 12 children obtained from case records. As reviewed in Appendix A, the children in this study did not form a homogeneous group in terms of their medical diagnosis and the length of speech therapy service. They could best be described as

children with a history of language impairment who currently had the most difficulty with narrative, verbal reasoning, and use of language.

To obtain background information on the children's current language abilities and hearing status, the Cantonese version of the Reynell Developmental Language Scales (RDLS, Reynell & Huntley, 1987), the Hong Kong Cantonese Receptive Vocabulary Test (CRVT) (Lee, Lee, & Cheung, 1996), and hearing screening were conducted. Different frequencies (500 Hz, 1000 Hz, 2000 Hz, and 4000 Hz) were presented to the children at 35 dB. The performance of the children in all these tests is presented in Table 1. Table 1 reveals that these children had different language abilities as reflected by the results of the RDLS (Reynell & Huntley, 1987) and the CRVT (Lee, Lee, & Cheung, 1996). Only four of the 12 children now received a score more than 1.0 SD below the mean in the RDLS—a cut-off generally used for diagnosis of language impairment. Only three children now received a score more than 1.0 SD below the mean in the CRVT. The two children who failed the hearing screening were referred to the Centre's Speech Therapist for follow-up.



Table 1. Results of the tests conducted in the screening session and the grouping of the children

Participant	Five Dollars Story	Hearing Assessment	RDLS		CRVT	
			Receptive	Expressive	Score	SD
Elaboration Group						
E1	4	Pass	+ 0.1 SD	- 0.4 SD	49	- 0.5 SD
E2	3	Fail <sup>a</sup>	- 2.8 SD	-2.4 SD	36	- 2.5 SD
E3	4	Pass	+ 1.9 SD	+ 1.1 SD	64	+ 1.0 SD
E4	4	Pass	+ 1.4 SD	+ 0.7 SD	61	0 SD
E5	4	Pass	+ 0.6 SD	+ 1.3 SD	61	0 SD
E6	4	Pass	-1.0 SD	- 0.5 SD	61	0 SD
No-Elaboration Group						
NE1	4	Left: Pass Right: Fail <sup>b</sup>	+ 1.0 SD	- 0.2 SD	42	- 1.5 SD
NE2	3	Pass	-0.6 SD	- 1.7 SD	51	- 1.3 SD
NE3	4	Pass	+ 0.1 SD	+ 0.4 SD	59	0 SD
NE4	4	Pass	- 0.6 SD	- 0.2 SD	61	0 SD
NE5	3	Pass	- 1.1 SD	- 1.8 SD	61	0 SD
NE6	4	Pass	+ 1.6 SD	0 SD	60	0 SD

<sup>a</sup> Threshold at 45 dB. <sup>b</sup> Threshold at 50 dB.

The 12 children were then randomly assigned into two groups, namely the elaboration (E) group and the no-elaboration (NE) group, and all of the children had to listen to two stories, one embedded with novel action words and the other with novel object words. In her research, Gray (2005) pointed out that the existing vocabulary of a child was the most reliable in predicting the fast-mapping receptive ability of the child. As a result, the group

equivalency between the E group and the NE group in this study was based on the existing vocabulary of the children, as measured by the CRVT (Lee, Lee, & Cheung, 1996). Results from the t-test showed that the two groups did not differ significantly with regard to their vocabulary size ( $t = 0.06, p = 0.95$ ). The two groups also did not differ in age ( $t = 0, p = 1$ ).

### *Materials*

#### *Target Words and Stories*

Four novel object words and four novel action words were created for this study. The object words and the action words were embedded in two different stories that were created by the author in collaboration with her dissertation supervisor for this study.

The object story is about six children shopping and buying birthday gifts for a boy Siu Ming. There were six birthday presents, in which four of them were novel objects that look like tools that people do things with, and novel words were created for each of these objects. The other two presents were real objects, and they were included to give the children some sense of success in seeing something they were able to name. The objects were presented in the following order in the story: /tan<sub>55</sub> ts<sup>h</sup>ε<sub>55</sub>/ (bicycle), /tui<sub>33</sub> nQ<sub>55</sub>/, /jou<sub>33</sub> pu<sub>55</sub>/, /kei<sub>55</sub> hai<sub>22</sub> jfn<sub>21</sub>/ (robot), /wei<sub>33</sub> hy<sub>55</sub>/, and /mQ<sub>33</sub> li<sub>55</sub>/. Different story scripts were written for children in the E group and children in the NE group, and the scripts are attached in Appendix B and Appendix C. In the script for the E group, the function of all novel objects was specified with a familiar verb (e.g., He eats the /jou<sub>33</sub> pu<sub>55</sub>/) and its shape was described by analogy to a familiar object (e.g., /jou<sub>33</sub> pu<sub>55</sub>/ is like a piece of bread). In the script for the NE group, the novel word was embedded in sentences which did not focus on the properties and the features of the objects, and these sentences only served to complete the story (e.g., Siu Chung takes one /jou<sub>33</sub> pu<sub>55</sub>/. He would like to buy /jou<sub>33</sub> pu<sub>55</sub>/ for Siu Ming.). They ensured that children were drawn to attend to the novel objects for a comparable length of time for the two groups.

The action story is about a family visiting the circus. They saw a show in which the

rabbits performed six different actions. Four were novel actions that look like work-out exercise in a gymnasium and novel words were invented for each of them. Two real actions were included for the same reason as in the object story. The actions were presented in the following order: /t<sup>h</sup>iu<sub>33</sub> tai<sub>22</sub> sɛ<sub>35</sub>/ (skipping), /jɔi<sub>23</sub> hɛ<sub>21</sub>/, /wiu<sub>23</sub> ki<sub>21</sub>/, /t<sup>h</sup>iu<sub>33</sub> fu<sub>55</sub> lai<sub>55</sub> hyn<sub>55</sub>/ (jumping through the hula hoop), /tau<sub>23</sub> nu<sub>21</sub>/, and /pflu<sub>23</sub> my<sub>21</sub>/. In the script for the E group, details on how one's body is manipulated to perform the action (e.g., His feet are on top and his hands are at the bottom when /tau<sub>23</sub> nu<sub>21</sub>/) and on the gadget required (e.g., You use your hands to walk up the stairs when /tau<sub>23</sub> nu<sub>21</sub>/) were given. In the script for the NE group, the novel word was embedded in sentences which did not focus on the properties and the features of the actions, and these sentences only served to complete the story (e.g., It is hard to /tau<sub>23</sub> nu<sub>21</sub>/. Not every Mr. Rabbit knows how to /tau<sub>23</sub> nu<sub>21</sub>/). They ensured that children were drawn to attend to the novel actions for a comparable length of time for the two groups. Readers are welcomed to contact the author for the scripts for the action word story.

All novel words were disyllabic with the phonetic structure of CVV CV. Previous study (Leonard et al., 1982) indicated that children with language impairment comprehended a greater number of in-phonology action words than normal children, and they tended to produce more in-phonology words than out-of-phonology words. To ensure success in the children's learning of the novel words, novel words used in this study included only those phonemes that were among the first few phonemes acquired in normal phonological development of Cantonese children as listed in So (1993).

In order to determine whether the stories and the word stimuli were developmentally appropriate for the children in this study, four typically developing children (ranged from 4 years 2 months to 5 years 1 month,  $M = 4$  years 7 months) and two children (4 years 2 months, and 4 years 8 months) diagnosed as having language impairment were invited to participate in a pilot test. For the stimuli to be developmentally appropriate, the children

should neither perform at ceiling nor floor level in the comprehension tests. The child heard the novel words three times, and each story was read twice. As a result, each child would have six exposures to each novel word. The child was then asked to choose a correct picture from four pictures.

For the purpose of the pilot study, the four typically developing children were each assigned to one of the following experimental conditions: (1) E-action word, (2) E-object word, (3) NE-action word, and (4) NE-object word. When tested immediately after the storytelling, the children scored between 58.3% and 83.3%. When tested one week later, they scored between 50.0% and 91.7%. The overall results were neither at ceiling nor floor level for the typically developing children within the age range.

For the pilot test with children with language impairment, the 4;02-year-old child was assigned to listen to both stories under NE condition, and the 4;08-year-old child was assigned to listen to both stories under E condition. However, as the latter child was absent for two consecutive weeks, the result of this child in comprehending novel words under E condition was incomplete. When tested immediately after the storytelling, the children scored between 41.6% and 66.7%. The only child in the NE group who was tested one week later received a score of 25.0% for both action and object words.

Given that this child performed at chance level, it reflected the possibility that the novel words were too difficult for children with language impairment. For the experimental study, the number of exposures to the novel words was thereafter raised from six to eight, and the children in the study would be asked also to imitate the novel word after the clinician in two instances. It was expected that increased exposures would encourage more successful encoding of the word and its meaning, while imitation would enhance subsequent retrieval of the new word (Sénéchal, 1997).

### *Procedures*

The children were seen for four sessions, the first session for screening, and the remaining three sessions for listening to the stories and taking the comprehension tests. These three reading sessions would be one week apart from each other.

In the first reading session, the author read the story to the child, and the author would encourage the child to pull up the pop-up pictures as she read along. To balance learning effects, half of the children in each group (i.e., three children) heard the object story in the first session, and the action story in the second session. The order of storybook reading was reversed for the other half of the group. Recall that there were four novel words in each story, each novel word appeared four times, and the story was read twice. As a result, the children would have a total of eight exposures to each novel word. At each reading, the children were asked to imitate each of the novel words after it was first introduced. After the story was read twice, the child would be tested immediately on their comprehension of the four novel words that appeared in the story. Details of the comprehension test and the scoring system would be presented later in the scoring section.

In the second session, the author started by assessing the child's comprehension of the novel words in the story told in the first session, and the child was presented with the same comprehension test again. After the test, the author read the second story to the child, and the procedure was the same as in the first story. After the second story was read twice, the child would be immediately tested on their comprehension of the novel words in the second story.

In the third session, the author would examine the child's comprehension of the novel words in the story told in second session.

### *Comprehension Tests and Scoring*

To ensure that children's comprehension of the novel words was not dependent on the story context, pictures used for the tests were drawn on separate papers. The four novel

objects were drawn on one plate for the object word comprehension test, and the four novel actions were drawn on another plate for the action word comprehension test. The novel objects were drawn without the agent acting on it (e.g., in the story, the children were shown the picture of Siu Chung eating the /jou<sub>33</sub> pu<sub>55</sub>/; In the test, the children were shown only the picture of /jou<sub>33</sub> pu<sub>55</sub>/ without Siu Chung), and the novel actions were drawn without the associated objects (e.g., in the story, the children were shown the picture of the rabbit /wiu<sub>23</sub> ki<sub>21</sub>/ a ball; In the test, the children were shown only the picture of the rabbit /wiu<sub>23</sub> ki<sub>21</sub>/ with the ball removed). The test plates of the comprehension tests were attached in Appendix D for object words, and in Appendix E for action words.

During the comprehension tests, the child was asked to point to the correct answer to the question among the four pictures. Three questions were asked for each novel word, which made up a total of 12 questions in the comprehension test for each word type. The child was tested again after one week with the same plate and the same 12 questions.

The three questions for each novel word tapped on the different levels of comprehension. The first question (type one question) asked for the name of the novel action/object. Nonetheless, as pointed out by Nash and Donaldson (2003), success in this task could be achieved even when the child has partial semantic and/or phonological representation of the word, as long as this partial representation is sufficient in helping the child to choose the target picture from other distractors. In sight of this, two additional questions were asked for each novel action/object. The second question (type two question) asked for the function of the novel object, or the object needed when acting out the novel action. The function/object indicated in the second question was visually available in the pictures of the storybooks. The only difference between the two groups is that the function/object was highlighted verbally in the elaboration condition, but not in the no-elaboration condition. The third question (type three question) asked for information that was

also visually available in the pictures of the storybooks, but it was not mentioned either in the elaboration condition and the no-elaboration condition. Children had to infer the answer from the pictures. These 12 questions were asked in a random order to avoid priming effect. One mark would be given for each correct answer, and zero mark for each incorrect answer. The maximum score for each comprehension test would thus be 12 marks. The questions asked and their corresponding question types were indicated in Appendix F and Appendix G.

### Results

The two independent variables in this study were storytelling conditions (elaboration and no-elaboration) and word types (action words and object words). The dependent variable was scores in the comprehension test. Each child was tested four times. These included testing (1) the comprehension of action words after listening to the “action word” story, (2) the comprehension of action words one week after listening to the “action word” story, (3) the comprehension of object words after listening to the “object word” story, and (4) the comprehension of object words one week after listening to “object word” story. As a result, there would be four scores for each child in this study. Each of these raw scores was transformed into percentage scores for statistical analyses. This was done by dividing the number of correct responses by the total number of questions presented in the comprehension test (i.e., twelve).

Two separate ANOVAs were run: One for the results collected immediately after storytelling, and the other for the results collected one week later. Statistical procedures were run to determine, at these two designated time, (a) whether there was a main effect for word type, (b) whether there was a main effect for storytelling condition, and (c) whether there was an interaction effect between word type and storytelling condition.

Most of the following discussion will be split into two parts—initial learning, which refers to the learning of the children immediately after the storytelling, and retention, which

refers to the learning of the children one week after the storytelling.

### *Initial Learning*

#### *Word Learning*

Learning is considered as having taken place if the children were able to score higher than chance level (i.e., 25.0%). Table 2 below gives the percentage correct scores of the 12 children in the comprehension test administered immediately after the storytelling. Table 2 reveals that only one child NE1 comprehended action words less than chance level. The majority of the children were able to learn the novel words in a storytelling context, regardless of whether elaboration of meanings was provided.

Table 2. Percentage correct scores of the children in the comprehension test given immediately after storytelling

Participant	Action word	Object word	Participant	Action word	Object word
E Group			NE Group		
E1	41.7%	100.0%	NE1	0.0%	33.3%
E2	41.7%	50.0%	NE2	41.7%	50.0%
E3	58.3%	83.3%	NE3	58.3%	50.0%
E4	75.0%	100.0%	NE4	41.7%	75.0%
E5	50.0%	41.7%	NE5	58.3%	50.0%
E6	50.0%	66.7%	NE6	66.7%	58.3%

#### *Effects of Word Type and Storytelling Condition*

The mean and the standard deviation of the comprehension test scores for each storytelling condition and word type are presented in Table 3. Children in E group (mean = 63.2, *SD* = 21.7) received a higher score than children in NE group (mean = 48.6, *SD* = 19.1). The children in both groups generally comprehended object words (mean = 63.2, *SD* = 22.0)

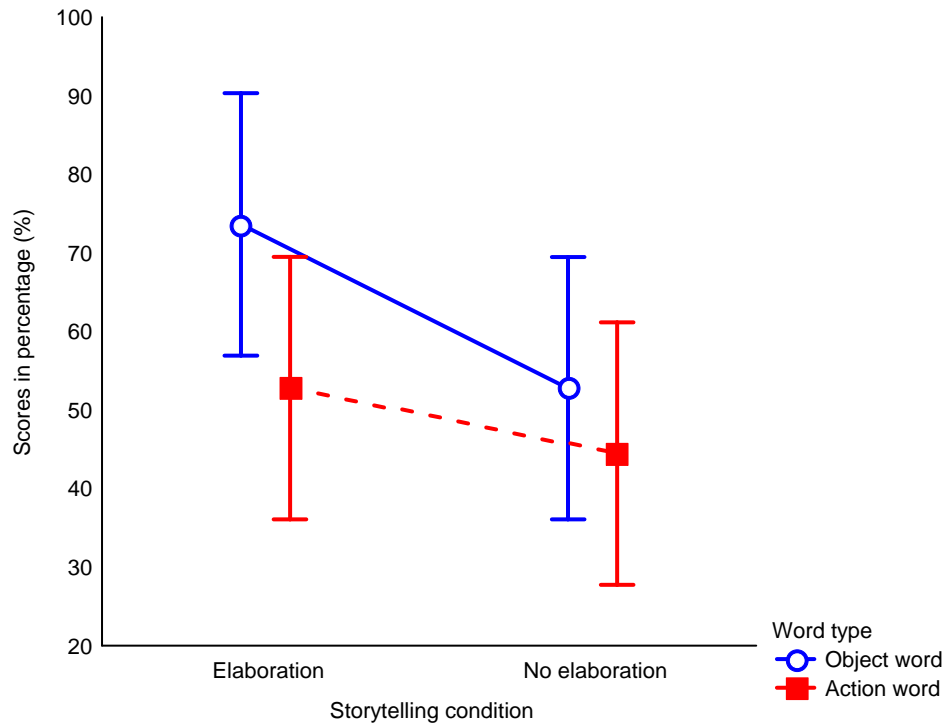


better than action words (mean = 48.6,  $SD = 18.7$ ).

Table 3. The mean (standard deviation) of the comprehension test scores obtained by the children immediately after storytelling

Storytelling condition	Word type		Mean (SD)
	Action word	Object word	
Elaboration	52.8 (12.5)	73.6 (24.9)	63.2 (21.7)
No-elaboration	44.5 (24.0)	52.8 (13.6)	48.6 (19.1)
Mean (SD)	48.6 (18.7)	63.2 (22.0)	

A two-way ANOVA was run for the results collected immediately after storytelling, and the interaction between the independent variables was plotted in Figure 1. The interaction effect between the two variables was not statistically significant ( $F(1,20) = 0.61$ ,  $p = .44$ ), giving an effect size measured by Cohen's  $f$  of .17. The main effects of storytelling condition ( $F(1,20) = 3.32$ ,  $p = .08$ ) and word type ( $F(1,20) = 3.31$ ,  $p = .08$ ) were both approaching significance. Both main effects showed an effect size  $f$  of .41.



*Figure 1.* Interaction between storytelling condition and word type when the children were tested immediately after the storytelling.

Cohen's  $f$  values of .10, .25, and .40 indicate small, medium, and large effect sizes respectively (Cohen, 1988). Given a large size for the main effects of storytelling condition and word type, it is very likely that differences will reach statistical significance with a larger sample size.

#### *Comprehension at Different Levels*

Recall that three questions, one for each type, were created for each of the novel words in the comprehension tests. Since there were six children in each group and there were four novel words in each word type, the maximum score for each group of children for each question type was 24. Table 4 gives the number of correct answers in each group of children for each question and word type.

Table 4. Number of correct answers in each group of children for each question type and word type

Question type	Action word		Object word	
	E group	NE group	E group	NE group
Type 1	8	6	14	12
Type 2	20	16	21	17
Type 3	10	10	18	9

*Note.* Maximum score for each cell is 24.

Children performed the best with type 2 questions, in which the answer was highlighted verbally in the script for the E group, and at the same time visually available for both the E and NE groups. They performed the worst with type 1 questions, which asked about the name of the novel objects or novel actions. In general, children in E group received a higher score than children in NE group for all types of questions.

#### *Retention after One Week*

##### *Retention of the Words Learnt*

Retention is defined as being able to score higher than chance level (i.e., 25.0%) when the children were tested on the novel words one week later. Table 5 below gives the percentage correct scores of the 12 children in the comprehension test administered one week after the storytelling. Except for E2 and NE1, the other 10 children scored above chance level in the comprehension test for action and object words. E2 scored at or lower than chance level in the second test for object words and action words when he was able to perform above chance level in the same tests carried out immediately after storytelling. For NE1, he scored 0% even in the first comprehension test for action words, and given that he did not show any comprehension in the first comprehension test, retention would not be expected in this second test.

Table 5. Percentage correct scores of the children in the comprehension test given one week after storytelling

Participant	Action word	Object word	Participant	Action word	Object word
E Group			NE Group		
E1	41.7%	66.7%	NE1	16.7%	25.0%
E2	16.7% <sup>a</sup>	25.0%	NE2	33.3%	58.3%
E3	33.3%	91.7%	NE3	66.7%	50.0%
E4	75.0%	100.0%	NE4	41.7%	50.0% <sup>a</sup>
E5	58.3%	75.0%	NE5	66.7% <sup>a</sup>	41.7%
E6	41.7% <sup>a</sup>	75.0%	NE6	75.0%	75.0%

<sup>a</sup> The second comprehension tests were carried out more than 7 days after the storytelling for these children as they were absent from school. The second test was carried out 10 days after the storytelling for E6, and 14 days after the storytelling for E2, NE4 and NE5.

#### *Effects of Word Type and Storytelling Condition*

The mean and the standard deviation of the comprehension test scores for each storytelling condition and word type one week after the storytelling are presented in Table 6. Children in E group (mean = 58.3, *SD* = 26.6) received a higher score than children in NE group (mean = 50.0, *SD* = 19.1). They also comprehended object words (mean = 61.1, *SD* = 23.9) better than action words (mean = 47.2, *SD* = 20.8).

Table 6. The mean (standard deviation) of the comprehension test scores obtained by the children one week after storytelling

Storytelling condition	Word type		Mean (SD)
	Action word	Object word	
Elaboration	44.5 (20.2)	72.2 (26.2)	58.3 (26.6)
No-elaboration	50.0 (23.0)	50.0 (16.7)	50.0 (19.1)
Mean (SD)	47.2 (20.8)	61.1 (23.9)	

The interaction effect between the two variables was not statistically significant ( $F(1,20) = 2.44, p = .13$ ), giving an effect size measured by Cohen's  $f$  of .34. The main effects of storytelling condition ( $F(1,20) = 0.88, p = .36$ ) and of word type ( $F(1,20) = 2.44, p = .13$ ) were also not significant. The main effect of storytelling condition showed an effect size of .21, while that of word type showed an effect size of .34.

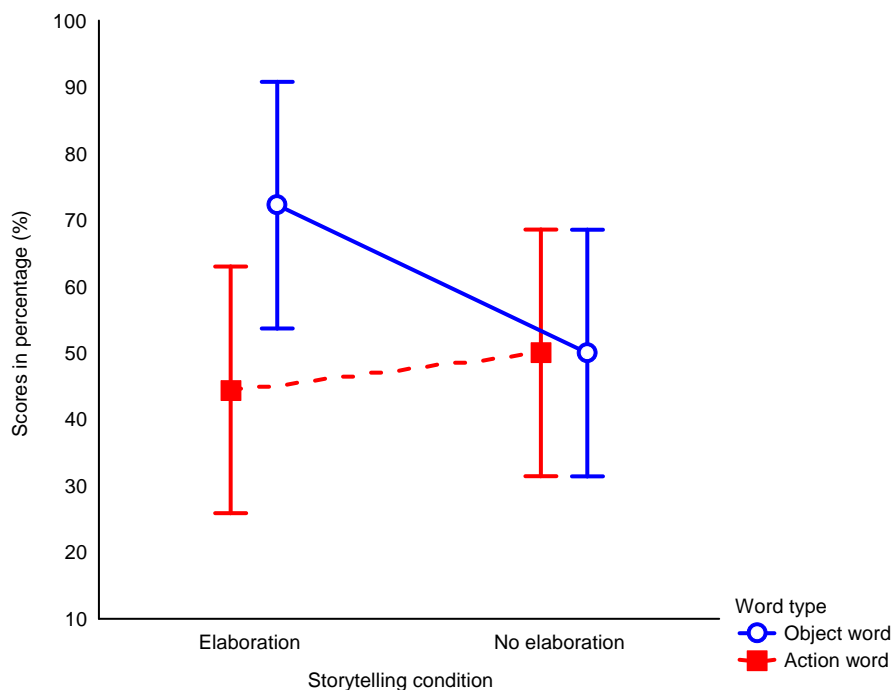


Figure 2. Interaction between storytelling condition and word type when the children were tested one week after the storytelling.

Given a medium size for the main effect of word type, it was likely that the difference will reach statistical significance with a larger sample size.

### *Comprehension at Different Levels*

As indicated in Table 7, children received the highest scores in type 2 questions. They generally obtained the lowest scores for type 1 questions, in which the child was asked to indicate the name of the novel actions or novel objects.

When comparing the performance of E group and NE group, E group generally received higher scores than NE group in all types of questions for object words. This advantage was not demonstrated for the questions for action words.

Table 7. Number of correct answers in each group of children for each question type and word type

Question type	Action word		Object word	
	E group	NE group	E group	NE group
Type 1	5	10	14	7
Type 2	16	15	21	18
Type 3	11	11	17	11

*Note.* Maximum score for each cell is 24.

## Discussion

### *Initial Learning*

#### *Main Effects of Word Type and Storytelling Condition*

Although the main effect of word type and the main effect of storytelling condition were not statistically significant, the effect size analysis indicated that they would probably reach significance when the sample size increased. This conclusion in this latter case would go in line with previous studies in which there were advantages of word learning for object words over action words and when elaboration of meanings was given.

*Main effect of storytelling condition.* The results of this study confirmed previous studies (e.g., Brett, Rothlein, & Hurley, 1996; Elley, 1989; Justice, Meier, & Walpole, 2005; Penno, Wilkinson, & Moore, 2002) that elaborating the meanings of the novel/unfamiliar words during storytelling would enhance the word learning of children. It supported Gupta's (2005) view that word learning can be facilitated by providing a rich semantic context and sufficient contextual cues to the child. Elaboration of meanings, in accordance to the model postulated by Gupta, facilitates word learning through providing a strong link between the phonological representation and the semantic representation. Justice, Meier, and Walpole (2005) speculated that children at risk of language impairment might not be as good as typically developing children in acquiring vocabulary in uncontrolled learning environments, and they pointed out that children with language impairment or at risk of a language impairment would benefit the most when elaboration of meanings were given. They cited Elley's (1989) findings to support their argument, in which Elley (1989) indicated that children with smaller vocabulary size learned as many words as children with higher vocabulary size when these children were given elaboration of meanings of unfamiliar words. Giving elaboration of meanings of unfamiliar words would allow children to learn under a better controlled context and would thus assist children with language impairment with word learning.

*Main effect for word type.* Gentner (1982), in her natural partitions hypothesis, proposed that learning of verbs would be more difficult than learning of nouns. The concepts expressed in simple nouns were perceptually more concrete as they could be distinguished easily from its surrounding, while the concepts expressed in verbs were often used to express relational meanings and the boundary of the concept was physically unconstrained. This is one reason why children found it harder to acquire the meaning of action words than object words.

Besides that action words are conceptually more difficult than object words, whether children can generalize their learning of the novel words out of the context of a story is another factor. As mentioned in the method section, the familiar action (e.g., eating) acting on the novel object (e.g., /jou<sub>33</sub> pu<sub>55</sub>/) and the familiar object used (e.g., the ball) during the novel action (e.g., /wiu<sub>23</sub> ki<sub>21</sub>/) were removed in the test plates. Only the novel objects and the novel actions were shown. In the study of Kerstin and Earles (2004), the participants were more likely to recognize a verb if it was accompanied by the same noun presented at the time of encoding. However, participants recognized nouns equally well regardless of whether they were accompanied by the same verb presented at the time of encoding. The authors came to the conclusion that the memory of verbs was more dependent on the semantic context than the memory of nouns. It is possible that the object word bias in our study is due to the nature that object words were less dependent on the semantic context and were more able to be generalized to other situations.

#### *Retention after One Week*

##### *Interaction between Storytelling Condition and Word Type*

Gentner (1978) proposed that verbs were usually used to indicate relational meaning, and that the components of verb meanings were more separable than noun meanings. Elaboration of meanings could help children to integrate the separated components of the verb meanings together, and elaboration of meanings would facilitate the learning of action words more than the learning of object words. It was thus anticipated that the interaction effect was not consistent across word type, but should be prominent across action words. However, this interaction did not turn out to be significant. This could be explained by a number of reasons. Firstly, when taking both the factors of word type and storytelling condition into consideration, the special advantage of the elaboration of meanings for the learning of new action words is not adequate to override the inherent difficulty in learning the



complexity of action words. As a result the interaction effect did not turn significant. Secondly, the background information of the children suggested that the children recruited for this study did not form a homogeneous group. They differed in terms of their medical diagnosis, profile of language impairment, severity of language impairment, length of speech therapy service, and the treatment received. As indicated by Dollaghan (1987), children diagnosed as having language impairment exhibited a wide variety of language problems, and it was by no means an easy task to categorize children into a homogeneous group based on set criteria. Even for a developmental language disorder that is well defined by a set of exclusionary and inclusionary criteria such as specific language impairment (SLI) children who are affected demonstrate heterogeneous language profiles (Leonard, 1998). As the children in this study were recruited based on very general criteria, the heterogeneity within group could be expected. Thirdly, children recruited in this study were divided into two groups based on their existing vocabulary. Many of their other language skills (e.g., use of language) varied and were not controlled in the grouping. Fourthly, the sample size in this study was small. As mentioned by Keppel (1991, as cited in Shaughnessy, Zechmeister, & Zechmeister, 2003), sample size is one of the most important factors in affecting the power of a statistical test. Many of other similar studies which investigated word learning in children (e.g., Penno, Wilkinson, & Moore, 2002; Robbins & Ehri, 1994; Sénéchal, 1997) employed at least 15 children within each group. Six children in each group in this study did not give enough power to reveal significant results even if they exist. The effect of individual variability on the power of the test was likely to be essential under this small sample size.

#### *Comprehension at Different Levels*

The general trend was that children did the best in answering type 2 questions, followed by type 3 questions, and then by type 1 questions. Recall that these three types of questions were tapping on different levels of comprehension of the novel words, the children

performed better in comprehending the meanings of the words (tapped by type two and three questions) than in recognizing the phonological form of the words (tapped by type one question). In accordance to the model postulated by Gupta (2005), this could be that the semantic representation and the phonologically represented word form were built at different pace, with the semantic representation built faster than the phonological representation during word learning, or possible impaired phonological memory skills in some of the children with language impairment further prevented their efficient establishment of the phonologically represented word form.

#### *Initial Word Learning and Retention*

As reflected in the results of the comprehension tests in Tables 2 and 5, the majority of children were able to learn and retain learned materials, regardless of the storytelling condition and the word type. The findings gave preliminary evidence that children could learn new words in a storytelling context and retain learned materials after one week, specifically when they heard the words eight times and had an opportunity to repeat each novel word twice. Further studies are however necessary to examine the effects of the number of exposure and the immediate repetition on word learning through direct manipulation of these variables.

Visual inspection of data suggests that elaboration of meanings favoured especially the learning and retention of object words. It is recommended that further studies with larger sample size to work on determining whether elaboration of meanings would facilitate learning and retention of object words better than action words.

#### *Clinical Implications*

This study suggested that storybook reading could facilitate word learning in children with a history of language impairment. Storybooks are handy and generally not very expensive, and stories usually contain a wide variety of vocabulary, it can be a good

therapeutic activity to be carried out at home. However, as indicated in the study of Johnston and Wong (2002) which surveyed Chinese and western mothers in Vancouver Canada, only 30% of the Chinese mother reported that they would read storybooks frequently together with their children. The idea of using storytelling activities to facilitate word learning of children is not likely to be popular among Chinese families. Results from this study provided preliminary support for the use of storybooks as a tool to facilitate children's word learning.

Learning of object words can be expected to take place in a static context like storyreading activity, and it can be facilitated when elaboration of meanings is given. Reading the story for a number of times, raising the number of exposures to the new words, and asking the children to imitate the words after the parents can also be useful for word learning to take place.

#### Future Research Direction

Visual inspection of data in our study suggested that elaboration of meanings in a storytelling context had a greater positive effect on object word learning than on action word learning. Future studies can verify whether elaboration of meanings have differential effect on learning of words with different word type by employing a larger sample size. Alternative therapeutic methods may have to be sought if further studies suggest that static condition like storytelling is not the most preferable environment for learning action words. Elaboration of meanings can be given under a more dynamic context (e.g., performing the actions with the children) to investigate whether action word learning can be facilitated when elaboration of meanings is given under a different context.

In order to understand the underlying process in word learning of children, future studies can also consider tapping comprehension of children at different aspects—semantic representation, phonological representation, and the link between them. Future studies which involve children with language impairment as participants can also help to pinpoint the

specific difficulties in which children with a certain type of language impairment (e.g., SLI) have in language learning.

#### Acknowledgement

I would like to thank Dr. Anita Wong, my dissertation supervisor, for her valuable advice and support, without which this dissertation would not have been possible. I would like to acknowledge Ms. Cecilia Au and all the staff at the Haven of Hope K.C. Liang Po Lam Early Education and Training Centre for helping with the recruitment of the children. Thanks to Ms. Elaine Yung for assisting with the pilot test. Thanks to Ms. Lam Tung Man for her marvellous pictures in the storybooks. Thanks to Ms. Ada Sze, Ms. Chan Tung Tung, and Ms. Patricia Fong for their help in data collection. I am grateful to all the children and their parents at the HKU Child Speech and Language Clinic and at the Haven of Hope K.C. Liang Po Lam Early Education and Training Centre for their participation in the research. Thanks to my family for their unfailing support.

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## Appendix A

*Demographic information of the children*

Participant	Age	Sex	Medical diagnosis	Length of ST service at EETC (months)	Date when first diagnosed as having language impairment	Professional who gave the language diagnosis	Assessment results given by the professional	Assessment results on the first day of ST service at EETC (age during assessment)		Current treatment
								RDLS	Informal <sup>†</sup>	
E1	4;03	M	PDD NOS	7	25-6-2004	ST at CAC	RDLS: VC: -1.73 SD VE: -1.67 SD			Narrative, verbal reasoning
NE1	4;04	M	Developmental delay	20	?	ST at CAC	?		VC: 2;06 VE: 2;00 (2;09)	Narrative, speech
E2	4;06	M	Developmental delay	5	3-10-2005	ST at EETC			VC: 3;00 VE: 2;00 (4;04)	Receptive and expressive language
NE2	4;10	M	Developmental delay	17	8-10-2004	ST at EETC			VC: 2;06 VE: 2;06 (3;06)	Receptive and expressive language
NE3	4;11	M	Developmental delay	31	17-1-2003	Doctor at CAC	?		VC: 2;06 VE: 1;06 (2;05)	Narrative, verbal reasoning
E3	5;03	M	Language and speech delay	30	29-8-2003	ST at EETC			VC: 2;00 VE: 2;00 (2;11)	Narrative, social skills



Participant	Age	Sex	Medical diagnosis	Length of ST service at EETC (months)	Date when first diagnosed as having language impairment	Professional who gave the language diagnosis	Assessment results given by the professional	Assessment results on the first day of ST service at EETC (age during assessment)		Current treatment
								RCLS	Informal <sup>†</sup>	
E4	5;07	M	Autistic features	15	?	?	?		?	Narrative, social skills
NE4	5;08	M	Developmental delay	32	27-6-2003	ST at CAC	?		VC: 2;00 VE: 1;06 (3;01)	Narrative, clause
NE5	5;09	M	Language delay	27	23-12-2002	Doctor at CAC	?	VC: -1.8 SD VE: -0.8 SD (3;09)		Narrative, verbal reasoning
E5	5;11	F	Developmental delay, weak social skills	42	3-3-2000	ST at EETC			VC: 1;06 VE: 1;06 (2;06)	Narrative, verbal reasoning
E6	6;01	M	Developmental delay	35	27-8-2002	Doctor at CAC	?	VC: -2.43 SD (3;02)	VE: 1;06-2;00 (3;02)	Narrative, social skills
NE6	6;01	M	Phonological delay	32	5-12-2002	Doctor at CAC	?		VC: 3;00 VE: 2;06 (3;06)	Narrative, speech

? implies that there were no details available from referral.

<sup>†</sup> implies that the assessment results were based on informal clinical designed test.

## Appendix B

*Script for the object story for the E group*

聽日嘅小明生日，六個小朋友決定買禮物俾佢。

去第一間鋪頭，原來係單車呀！小朋友可以坐單車周圍去，單車行得好快架。你留心聽住，試吓跟我講一次：單車。但係小琪唔記得帶銀包呀，於是小寶就幫佢俾錢。

去第二間鋪頭，咦，原來係 /tui<sub>33</sub> nQ<sub>55</sub>/。/tui<sub>33</sub> nQ<sub>55</sub>/ 好似一把遮咁，小強戴 /tui<sub>33</sub> nQ<sub>55</sub>/ 喺頭度。你留心聽住，試吓跟我講一次：/tui<sub>33</sub> nQ<sub>55</sub>/。點知，突然間好大風呀，啲風吹吹吹，吹走咗小強份禮物。小強即刻走去執番佢，好彩執得番啫。

去第三間鋪頭，咦，原來係 /jou<sub>33</sub> pu<sub>55</sub>/。/jou<sub>33</sub> pu<sub>55</sub>/好似一個麵包咁，小聰食咗個 /jou<sub>33</sub> pu<sub>55</sub>/。你留心聽住，試吓跟我講一次：/jou<sub>33</sub> pu<sub>55</sub>/。跟住，小聰就買咗一個俾小明。

去第四間鋪頭，咦，原來係機械人呀。機械人好似個公仔咁，機械人係小祥最鐘意既玩具。你留心聽住，試吓跟我講一次：機械人。點知機械人自己走開咗喎。

去第五間鋪頭，小寶係度買嘢。咦，原來係 /wei<sub>33</sub> hy<sub>55</sub>/。/wei<sub>33</sub> hy<sub>55</sub>/ 好似一隻雀仔咁，小寶坐喺 /wei<sub>33</sub> hy<sub>55</sub>/上面。你留心聽住，試吓跟我講一次：/wei<sub>33</sub> hy<sub>55</sub>/。

最後去第六間鋪頭。小花睇吓，原來係 /mQi<sub>33</sub> li<sub>55</sub>/。/mQi<sub>33</sub> li<sub>55</sub>/ 好似一隻碗咁，/mQi<sub>33</sub> li<sub>55</sub>/ 可以吸啲星星落嚟。你留心聽住，試吓跟我講一次：/mQi<sub>33</sub> li<sub>55</sub>/。

最後，六個小朋友買完禮物，佢地就一齊去小明既生日會，小明已經等緊佢地啦。佢地送禮物俾小明，之後仲一齊唱生日歌，一齊食蛋糕，全部人都過咗一個好開心既夜晚。

(Readers are welcomed to contact the author at [yungyung.helen@gmail.com](mailto:yungyung.helen@gmail.com) for the script for the action story for E group)

*English translation of the script for the object story for the E group*

Tomorrow will be Siu Ming's birthday. Six children decide to buy presents for him.

We reach the first shop. It is a bicycle! Children can ride on the bicycle and go anywhere. The bicycle goes really fast. Listen carefully and say it after me: Bicycle. However, Siu Kei forgets to bring her purse, and Siu Bo has to pay for her.

We reach the second shop. Oh, it is /tui<sub>33</sub> nQ<sub>55</sub>/. /tui<sub>33</sub> nQ<sub>55</sub>/ is like an umbrella. Siu Keung puts the /tui<sub>33</sub> nQ<sub>55</sub>/ on his head. Listen carefully and say it after me: /tui<sub>33</sub> nQ<sub>55</sub>/. But then strong wind blows suddenly. The wind blows hard, and it blows away Siu Keung's present. Siu Keung quickly goes and fetches for it. Luckily he gets it.

We reach the third shop. Oh, it is /jou<sub>33</sub> pu<sub>55</sub>/. /jou<sub>33</sub> pu<sub>55</sub>/ is like a piece of bread. Siu Chung eats the /jou<sub>33</sub> pu<sub>55</sub>/. Listen carefully and say it after me: /jou<sub>33</sub> pu<sub>55</sub>/. Siu Chung decides to buy one for Siu Ming.

We reach the fourth shop. Oh, it is a robot. Robot is like a doll. Robot is Siu Cheung's favourite toy. Listen carefully and say it after me: robot. Nonetheless, the robot flees away unexpectedly.

We reach the fifth shop. Siu Bo is shopping there. Oh, it is /wei<sub>33</sub> hy<sub>55</sub>/. /wei<sub>33</sub> hy<sub>55</sub>/ is like a bird. Siu Bo sits on the /wei<sub>33</sub> hy<sub>55</sub>/. Listen carefully and say it after me: /wei<sub>33</sub> hy<sub>55</sub>/.

Finally we reach the sixth shop. Siu Fa has a look, Oh, it is /mQ<sub>33</sub> li<sub>55</sub>/. /mQ<sub>33</sub> li<sub>55</sub>/ is like a bowl. /mQ<sub>33</sub> li<sub>55</sub>/ can suck the stars down. Listen carefully and say it after me: /mQ<sub>33</sub> li<sub>55</sub>/.

At the end, the six children finish buying their presents, and they go to Siu Ming's birthday party together. Siu Ming is already waiting for them. They give the present to Siu Ming, and they sing birthday song and eat birthday cake together. All of them have an enjoyable night.

## Appendix C

*Script for the object story for the NE group*

聽日喺小明生日，六個小朋友決定買禮物俾佢。

去第一間鋪頭，原來係單車呀！呢架單車好新呀，小明一定會好鐘意呢架單車。你留心聽住，試吓跟我講一次：單車。但係小琪唔記得帶銀包呀，於是小寶就幫佢俾錢。

去第二間鋪頭，咦，原來係 /tui<sub>33</sub> nQ<sub>55</sub>/。小強揀咗一個 /tui<sub>33</sub> nQ<sub>55</sub>/，佢試吓個 /tui<sub>33</sub> nQ<sub>55</sub>/。你留心聽住，試吓跟我講一次：/tui<sub>33</sub> nQ<sub>55</sub>/。點知，突然間好大風呀，啲風吹吹吹，吹走咗小強份禮物。小強即刻走去執番佢，好彩執得番啫。

去第三間鋪頭，咦，原來係 /jou<sub>33</sub> pu<sub>55</sub>/。小聰攞咗個 /jou<sub>33</sub> pu<sub>55</sub>/，佢想送 /jou<sub>33</sub> pu<sub>55</sub>/俾小明。你留心聽住，試吓跟我講一次：/jou<sub>33</sub> pu<sub>55</sub>/。跟住，小聰就買咗一個俾小明。

去第四間鋪頭，咦，原來係機械人呀。小祥望住個機械人，佢好鐘意呢個機械人。你留心聽住，試吓跟我講一次：機械人。點知機械人自己走開咗喎。

去第五間鋪頭，小寶喺度買嘢。咦，原來係 /wei<sub>33</sub> hy<sub>55</sub>/。/wei<sub>33</sub> hy<sub>55</sub>/好好玩呀，小寶喺 /wei<sub>33</sub> hy<sub>55</sub>/上面幾開心。你留心聽住，試吓跟我講一次：/wei<sub>33</sub> hy<sub>55</sub>/。

最後去第六間鋪頭。小花睇吓，原來係 /mQi<sub>33</sub> li<sub>55</sub>/。小花拎住個 /mQi<sub>33</sub> li<sub>55</sub>/，個 /mQi<sub>33</sub> li<sub>55</sub>/好得意呀。你留心聽住，試吓跟我講一次：/mQi<sub>33</sub> li<sub>55</sub>/。

最後，六個小朋友買完禮物，佢地就一齊去小明既生日會，小明已經等緊佢地啦。佢地送禮物俾小明，之後仲一齊唱生日歌，一齊食蛋糕，全部人都過咗一個好開心既夜晚。

(Readers are welcomed to contact the author at [yungyung.helen@gmail.com](mailto:yungyung.helen@gmail.com) for the script for the action story for NE group)

*English translation of the script for the object story for the NE group*

Tomorrow will be Siu Ming's birthday. Six children decide to buy presents for him.

We reach the first shop. It is a bicycle! This bicycle is new. Siu Ming will surely love this bicycle. Listen carefully and say it after me: Bicycle. However, Siu Kei forgets to bring her purse, and Siu Bo has to pay for her.

We reach the second shop. Oh, it is /tui<sub>33</sub> nQ<sub>55</sub>/. Siu Keung picks a /tui<sub>33</sub> nQ<sub>55</sub>/. He tries the /tui<sub>33</sub> nQ<sub>55</sub>/. Listen carefully and say it after me: /tui<sub>33</sub> nQ<sub>55</sub>/. But then strong wind blows suddenly. The wind blows hard, and it blows away Siu Keung's present. Siu Keung quickly goes and fetches for it. Luckily he gets it.

We reach the third shop. Oh, it is /jou<sub>33</sub> pu<sub>55</sub>/. Siu Chung takes one /jou<sub>33</sub> pu<sub>55</sub>/. He would like to buy /jou<sub>33</sub> pu<sub>55</sub>/ for Siu Ming. Listen carefully and say it after me: /jou<sub>33</sub> pu<sub>55</sub>/. Siu Chung decides to buy one for Siu Ming.

We reach the fourth shop. Oh, it is a robot. Siu Cheung looks at the robot. He very much likes this robot. Listen carefully and say it after me: robot. Nonetheless, the robot flees unexpectedly.

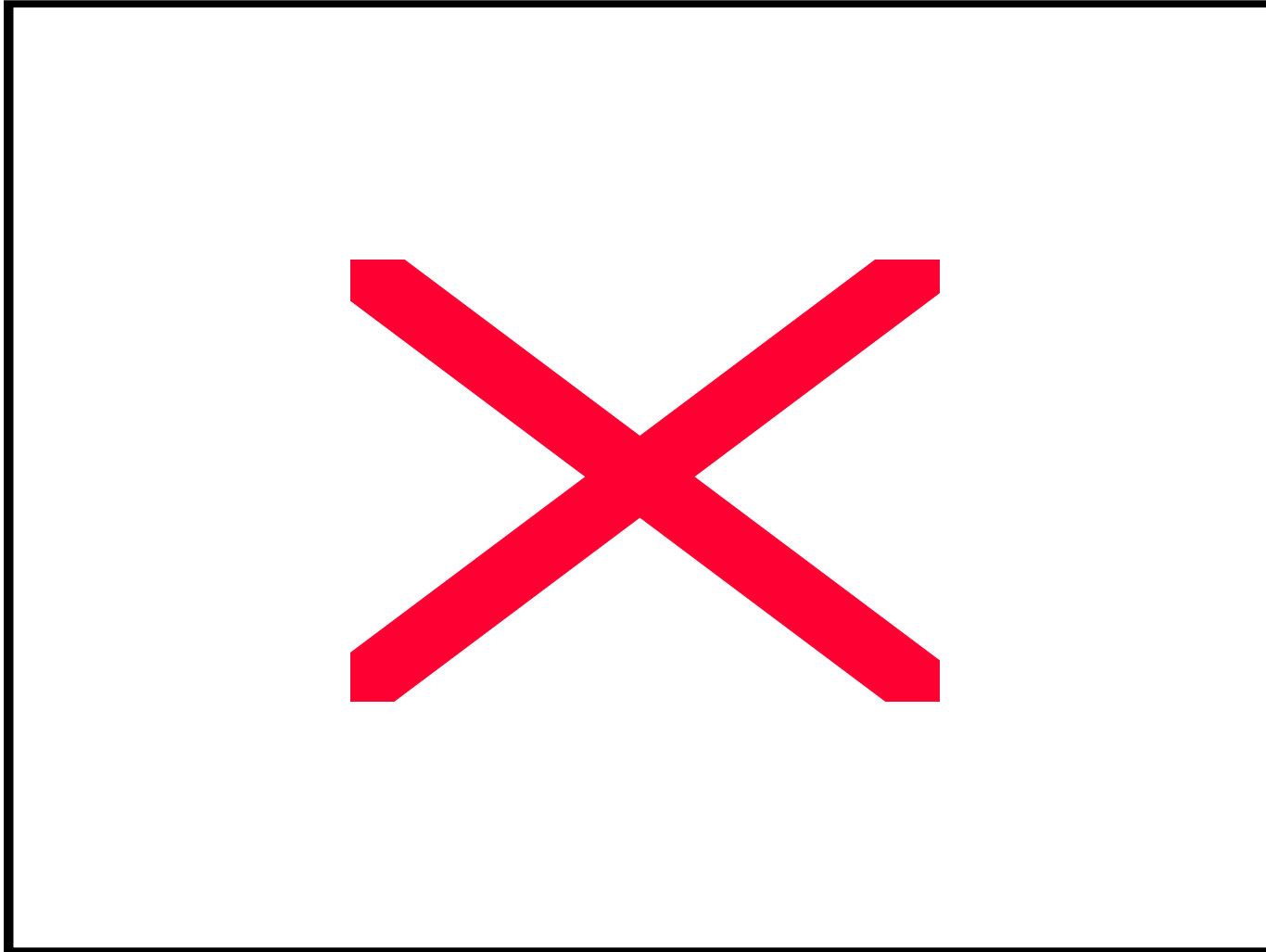
We reach the fifth shop. Siu Bo is shopping there. Oh, it is /wei<sub>33</sub> hy<sub>55</sub>/. /wei<sub>33</sub> hy<sub>55</sub>/ is fun to play with. Siu Bo looks so happy on the /wei<sub>33</sub> hy<sub>55</sub>/. Listen carefully and say it after me: /wei<sub>33</sub> hy<sub>55</sub>/.

Finally we reach the sixth shop. Siu Fa has a look, Oh, it is /mQ<sub>33</sub> li<sub>55</sub>/. Siu Fa carries the /mQ<sub>33</sub> li<sub>55</sub>/. The /mQ<sub>33</sub> li<sub>55</sub>/ is lovely. Listen carefully and say it after me: /mQ<sub>33</sub> li<sub>55</sub>/.

At the end, the six children finish buying their presents, and they go to Siu Ming's birthday party together. Siu Ming is already waiting for them. They give the present to Siu Ming, and they sing birthday song and eat birthday cake together. All of them have an enjoyable night.

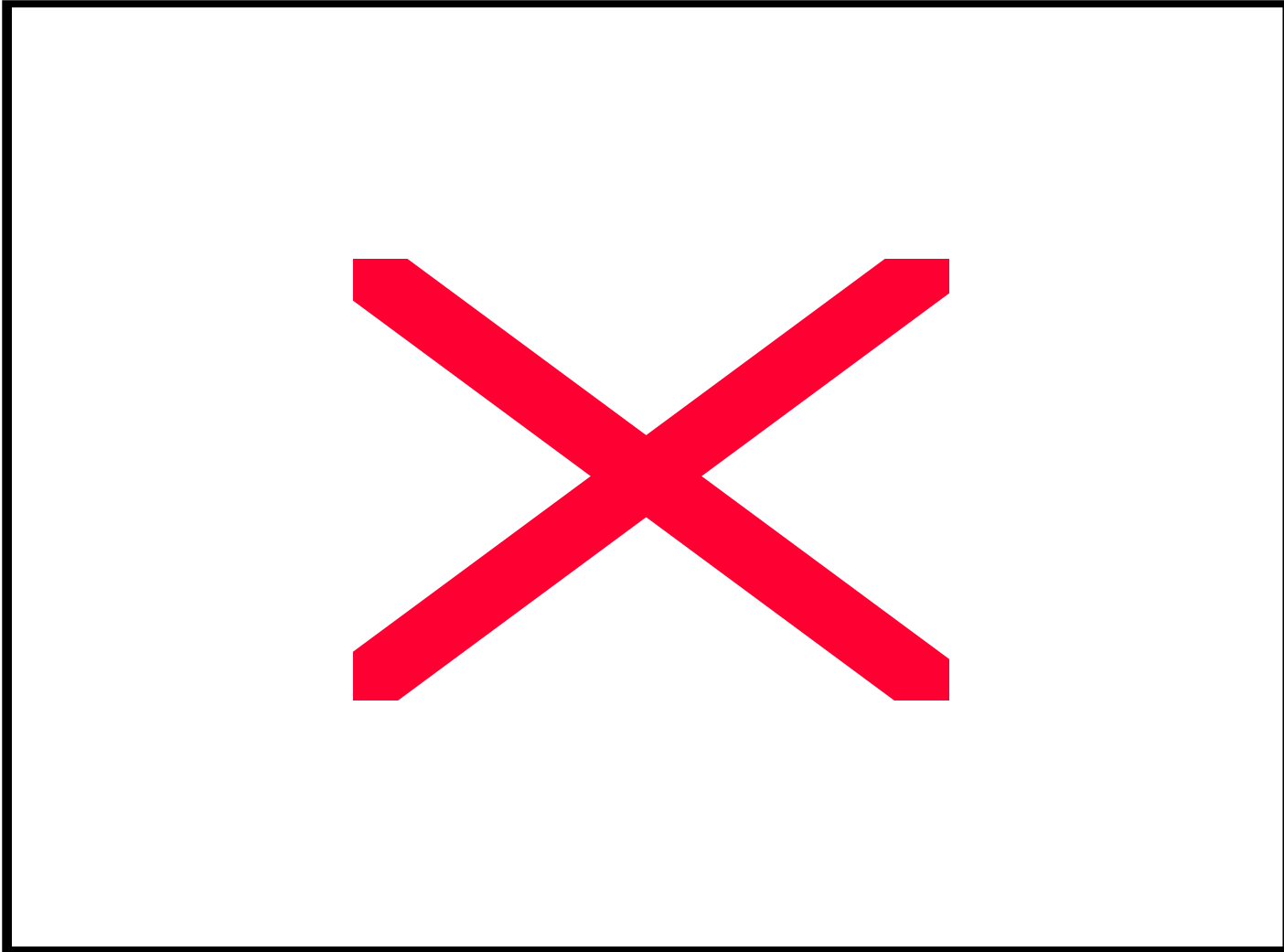
Appendix D

*Comprehension test plate for object word story*



Appendix E

*Comprehension test plate for action word story*



## Appendix F

*Comprehension test questions for object word story*

Question type	Chinese question	English translation	Answer
1	邊個係 /tui <sub>33</sub> nQ <sub>55</sub> / ?	Which one is /tui <sub>33</sub> nQ <sub>55</sub> /?	/tui <sub>33</sub> nQ <sub>55</sub> /
2	邊個係戴喺頭度架 ?	Which one can be worn on head?	/tui <sub>33</sub> nQ <sub>55</sub> /
3	邊個可以擋雨 ?	Which one can help to avoid rain?	/tui <sub>33</sub> nQ <sub>55</sub> /
1	邊個係 /jou <sub>33</sub> pu <sub>55</sub> / ?	Which one is /jou <sub>33</sub> pu <sub>55</sub> /?	/jou <sub>33</sub> pu <sub>55</sub> /
2	邊個可以用黎食 ?	Which one can be eaten?	/jou <sub>33</sub> pu <sub>55</sub> /
3	邊個係軟林林架 ?	Which one is soft?	/jou <sub>33</sub> pu <sub>55</sub> /
1	邊個係 /wei <sub>33</sub> hy <sub>55</sub> / ?	Which one is /wei <sub>33</sub> hy <sub>55</sub> /?	/wei <sub>33</sub> hy <sub>55</sub> /
2	邊個可以用黎坐 ?	Which one can be sat?	/wei <sub>33</sub> hy <sub>55</sub> /
3	邊個可以飛 ?	Which one can fly?	/wei <sub>33</sub> hy <sub>55</sub> /
1	邊個係 /mQ <sub>33</sub> li <sub>55</sub> / ?	Which one is /mQ <sub>33</sub> li <sub>55</sub> /?	/mQ <sub>33</sub> li <sub>55</sub> /
2	邊個用黎捉星星 ?	Which one can be used to catch stars?	/mQ <sub>33</sub> li <sub>55</sub> /
3	邊個可以用黎「莊」嘢 ?	Which one can carry things inside?	/mQ <sub>33</sub> li <sub>55</sub> /



## Appendix G

*Comprehension test questions for action word story*

Question type	Chinese question	English translation	Answer
1	邊個係 /jQi <sub>23</sub> hε <sub>21</sub> / ?	Which one is /jQi <sub>23</sub> hε <sub>21</sub> /?	/jQi <sub>23</sub> hε <sub>21</sub> /
2	邊個要用個架架 ?	Which one needs a rack?	/jQi <sub>23</sub> hε <sub>21</sub> /
3	邊個要戴手套架 ?	Which one needs to wear a glove?	/jQi <sub>23</sub> hε <sub>21</sub> /
1	邊個係 /wiu <sub>23</sub> ki <sub>21</sub> / ?	Which one is /wiu <sub>23</sub> ki <sub>21</sub> /?	/wiu <sub>23</sub> ki <sub>21</sub> /
2	邊個要用個波架 ?	Which one needs a ball?	/wiu <sub>23</sub> ki <sub>21</sub> /
3	邊個要用地氈架 ?	Which one needs a carpet?	/wiu <sub>23</sub> ki <sub>21</sub> /
1	邊個係 /tau <sub>23</sub> nu <sub>21</sub> / ?	Which one is /tau <sub>23</sub> nu <sub>21</sub> /?	/tau <sub>23</sub> nu <sub>21</sub> /
2	邊個要用樓梯架 ?	Which one needs the stairs?	/tau <sub>23</sub> nu <sub>21</sub> /
3	邊個要戴帽架 ?	Which one needs to wear a hat?	/tau <sub>23</sub> nu <sub>21</sub> /
1	邊個係 /pflu <sub>23</sub> my <sub>21</sub> / ?	Which one is /pflu <sub>23</sub> my <sub>21</sub> /?	/pflu <sub>23</sub> my <sub>21</sub> /
2	邊個要用彈弓架 ?	Which one needs a spring?	/pflu <sub>23</sub> my <sub>21</sub> /
3	邊個要著特別既鞋架 ?	Which one needs to put on special shoes?	/pflu <sub>23</sub> my <sub>21</sub> /