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Author(s)	Lam, Wai-sum, Winsome; 林慧心
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**Effect of Linguistic Context on Metaphor Comprehension
in Cantonese-speaking Children**

LAM Wai-sum, Winsome

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Abstract

The present study investigated the extent of influence of linguistic context on metaphor comprehension in Cantonese speaking children. Forty-eight preschool and primary school children aged 4 to 8 and eight adults interpreted 5 metaphors incorporated in story contexts congruent, incongruent and neutral to the metaphor meaning. The result indicated that 70% of children as young as 4 were able to give metaphoric interpretations when a congruent context was available. A significant interaction between story condition and age was observed. There was a descending performance from congruent, neutral and incongruent stories, with the extent of contextual influence minimized with age. Capability to adjust metaphoric interpretation to satisfy the contextual demand was also found. Pedagogical implications on metaphor teaching and further research directions were discussed.

Introduction

In human conversation, it is not uncommon that people use figurative language, in which sentences are taken to mean differently from their literal interpretations. Metaphor is an apparent example of such ubiquitous aspect of language. One saying ‘My brother is a monkey’ does not intend to mean that the speaker’s brother is a real monkey which is contextually inappropriate. Rather, the speaker may imply that the brother shares some similar characteristic(s) with a monkey. In order to comprehend a metaphor, comparison has to be made between the subject (referred to as the *topic*, i.e. the brother) and the predicate (the *vehicle*, i.e. a monkey). With the support of contextual cues, listeners then infer the most appropriate shared characteristic(s) (the *ground*) (e.g. very thin or very energetic) for metaphor meaning (Carroll, 2008; Nippold, 2007).

Contextual effects on metaphor comprehension

The significant role of context in metaphor comprehension in children has been well documented. Context is ‘the common ground held between a speaker and a listener’ (Vosniadou; 1989, pp. 160). Broadly speaking, there are two types of context. Intrinsic context refers to the shared experience and cultural knowledge, whereas extrinsic context includes the *linguistically* and *physically* shared information. Much experimental research has been done on the effects of *linguistic* context on metaphor comprehension in language processing and language acquisition (e.g. Grice, 1975; Lerorato & Cacciari, 1999; Nippold & Martian, 1989). Linguistic context is defined as ‘the common ground created on the basis of the speaker’s and the listener’s previous linguistic communication, what has been said or what can be inferred on the basis of what has been said’ (Vosniadou, 1989, pp. 160). Linguistic context is believed to facilitate metaphor comprehension in young children by eliminating two major obstacles. Firstly, due to the limited conceptual knowledge, young children often fail to discover that the literal interpretation of a metaphor is inappropriate.

Various studies support this claim by pointing out that similes, in which the relationship between the topic and vehicles is made more explicit by inserting the word *like*, are comprehended more readily than metaphors in young children (Happé, 1995; Seidenberg & Bernstein, 1986). Linguistic context provides additional information to supplement children's limited knowledge base and guide them that *literal interpretation is impossible* (Vosniadou, 1989). Apart from the difficulty in realizing the need to interpret a metaphor nonliterally, young children with limited conceptual and semantic knowledge often fail in seeing the 'hidden' similarity between the literally distinct *topic* and *vehicle* (Vosniadou, 1989; Evans & Gamble, 1988; Zharikov, & Gentner, 2002). Thus, the second facilitative function of linguistic context is that it provides information to help them identify the underlying similarity, so that they can draw inferences about the specific meaning of the metaphorical input.

Existing experimental findings provide concrete evidence to support the facilitative effect of linguistic context on metaphor comprehension. Children comprehend metaphors better in appropriate contexts (Reynolds & Ortony, 1980; Gildea & Glucksberg, 1983; Inhoff, Lima, & Carroll, 1984; Vosniadou, Ortony, Reynolds & Wilson, 1984; Siltanen, 1989). Children as young as pre-school are capable of comprehending metaphors when a facilitative linguistic context is available. In the study by Vosniadou et al. (1984) on 90 children aged from 4 to 9, the researchers found that metaphorical sentences representing predictable story endings were more easily understood by young children than those representing unpredictable ones.

Waggoner et al. (1997) conducted a subsequent study on 288 children aged 7, 9 and 11 and 72 young adults between ages 18 and 22. Participants were assessed through a force-choice task asking about the metaphor meaning and an explanation task about their interpretation towards the meaning of the metaphor. Metaphors were presented in three types of stories, (1) context supportive to the dominant metaphor meaning, (2) context contradicted

with the dominant metaphor meaning and , (3) natural context neither supportive nor conflicting. By comparing children's performance in these three contexts, this controlled design could provide a clearer evidence on how facilitative contexts assist children's metaphor comprehension. The result illustrated that children's ability to comprehend metaphors was facilitated in the supportive context and hindered in the conflicting context. However, a high accuracy in interpreting metaphor in neutral context in the youngest children also suggested that children were not solely relied on the highly predictive context for metaphor comprehension. The explanation answer, which reflected how the children came up with the answer in the force-choice task, also supported children's sensitivity towards the contextual changes. That meant, even if the metaphors used were highly dominant in the conventional use in meaning, children were able to give explanation from the non-dominant sense according to the story context. For instance, a first grader could explain why '*Betty was a colorful rainbow*' was interpreted as '*Betty was sad ingeniously*' based on the conflicting story context. Their flexibility to shift metaphorical meaning based on contextual clues indicated that children's metaphor comprehension in context was more sophisticated than what the prior studies suggested.

The present study

The present study aimed to replicate Waggoner et al.'s (1997) study to investigate the effects of linguistic context on metaphor comprehension in Cantonese-speaking children. However, Waggoner and his colleagues (1997) found that children at 6- or 7-year-old, being the youngest group under their investigation, had already managed to provide clear and high-quality explanations for the metaphorical meaning, the present study would extend the age of investigation to preschool years so as to examine the age of onset and developmental trend of metaphor understanding. As it was generally agreed that children's comprehension was underestimated in the explanation task (i.e. children being able to understand the

metaphor might fail to provide explanation for their understanding), it was plausible to hypothesize that children younger than 6 are able to comprehend metaphors, although they may fail to provide explanations. Moreover, as prior studies studying contextual influence dated back to the 1980s and 1990s, it was worthwhile to conduct an up-to-date study to investigate any changes and speculate any possible reasons. Finally, by examining the effect of linguistic contexts towards metaphor understanding, it could shed light on the pedagogical direction of metaphor teaching in children.

Comprehension was assessed in two dimensions in the present study. One was the metaphor meaning while the other was the explanation for the meaning. Different from Waggoner et al.'s (1997) study, a paraphrase task was employed in addition to a force-choice task to assess the metaphor meaning, in the hope that more insights could be obtained when the participants were given an opportunity to respond spontaneously. Meanwhile, although an explanation task was criticized as underestimating child's comprehension, it was highly valued to identify the process that children assign the meaning and their sensitivity on shifting metaphor meaning based on contextual changes. Even when children provided a metaphor meaning differently from adults, they might have in fact re-interpreted the metaphor to meet the contextual demands. The rationale, if any, for their alternative interpretation could be reviewed only when explanation was requested.

More specifically, this study aimed to explore, in pre-school and school age Cantonese children,

1. the age of onset of metaphor understanding,
2. the effect of context on metaphor comprehension across age, and
3. whether flexibility in shifting the dominant metaphor meaning to non-dominant one based on contextual changes occur.

Method

Participants

Forty-eight typically developing children aged between 3;10 and 8;4 were recruited as the participants. The 3;10 to 5;2 aged children were sourced from two local nurseries while the older children were from three primary schools. All participants were selected by teachers according to the following inclusion criteria. First, they were native Cantonese speakers. Second, they had no known history of speech, language, intellectual and sensory impairments. Third, they had age-appropriate language abilities ascertained by initial language assessments. This was done by conducting The Hong Kong Cantonese Receptive Vocabulary Test (HKCRVT) (Lee, Lee, & Cheung, 1996) on 3;10 to 5;2 aged children and the subtest of Hong Kong Cantonese Grammar (HKCG) in Hong Kong Cantonese Oral Language Assessment Scale (HKCOLAS) (T'sou, Lee, Tung, Chan, Man & To, 2006) on the older children. Eight adults (aged between 22 and 24) were also recruited as a control group for developmental comparison. Adult participants were native Cantonese speakers who were undergraduates of different disciplines. All participants were assigned into seven age groups, with eight in each group and equal number of male and female. Participant information was shown in Table 1.

Table 1.

Background Information of the Participants

Age group	Mean age	Schooling	Mean standard scores	
			HKCRVT	HKCG in HKCOLAS
3;10 - 4;02	4;0	Nursery	0.688	-
4;04 - 4;08	4;6	Nursery	0.438	-
4;10 - 5;02	5;0	Nursery	0.313	-
5;08 - 6;07	6;0	Primary one	-	0.975
6;08 - 7;07	7;1	Primary two	-	0.163
7;08 - 8;07	8;1	Primary three	-	0.925
22 to 24	23	Undergraduate	-	-

Selection of test items and materials

Thirteen common examples of metaphoric expressions were collected from story books and television media. The metaphors were incorporated in a neutral context and interpreted by 15 adults (who were not the participants in the main study). Nine metaphors attaining over 90% percentage of consistent interpretation by the adults were chosen. This was to ensure the high dominance of metaphor meaning in order to clearly assess whether children would re-interpret metaphors from the non-dominant sense to meet the contextual demand. Furthermore, comprehension of metaphors in the neutral context was only possible when the metaphors were dominant and clear in meaning.

For each selected metaphor, stories congruent, incongruent and neutral to the metaphor meaning were derived. In the congruent condition, the story context was predictive to the dominant meaning of the metaphor. In the incongruent condition, the context and metaphor meaning contradicted with each other. In the neutral condition, the story was neither supportive nor conflicting. The stories centered on incidents happened in familiar settings of local children. Each story finished within 4 lines, with a metaphor incorporated at the end. To

ascertain that each story context was congruent, neutral or incongruent in nature, the stories were trialed out on another 5 normal adults. They were presented with story scripts with a blank replacing each metaphor. They were then asked to complete the story based on the story context. Modification on the story context was made until all their answers matched with the metaphor meaning in congruent condition, and conflicted with the metaphor meaning in incongruent condition. Adjustment on neutral stories was also done until they did not guide the respondents to a specific answer.

One kindergarten teacher and two primary school Chinese teachers were then consulted to collect their expert opinions on the suitability of the metaphors and language of the stories to children aged 4 to 8. Finally, five most appropriate metaphors and their respective stories (a total of 15) were selected as the stimuli. One metaphor and its neutral story were chosen as a practice story (see Appendix A for the metaphors chosen and Appendix B for the stories).

All the selected story scripts were recorded onto an INNOMAX DR 838 portable digital recorder as the auditory stimuli. The intonation of the speaker was controlled to ensure that the metaphor interpretation of the participants would not be influenced by para-linguistic cues. Color drawings for the story scenes were also presented to sustain the participants' interest and provide supporting context to the comprehension of the stories.

Procedures

Two interviews were carried out on each participant, with one-week-gap (5 to 7 days) in between. Such a design was to examine the two testing modes of the force-choice and paraphrase questions on metaphor meaning and to minimize the learning effect of the stories.

Initial interview. The participants were tested individually in a quiet room in their own nurseries or schools. After the self-introduction of the investigator (i.e. the author of this study), the participant was instructed that they were going to listen to some stories and answer questions about the stories afterwards.

The participant first listened to a practice story of neutral condition through the

earphones with pictorial support. After listening to each story, she was asked about her interpretation for the metaphor meaning upon a paraphrase task: 「故仔話, [人物] 係 [比喻], 即係咩意思?」 ‘In the story, it was said that [story character] was [metaphor], what did it mean?’ Regardless of the accuracy of children’s answer, the investigator would proceed to the explanation task. Specifically, she was asked: 「點解話一個人係 [比喻] 等於佢 [問題(1)的答案]?」 ‘Why does calling someone [metaphor] mean that they were [the answer provided previously]?’ High quality explanation (refer to the scoring criteria in the next section) was praised and modeled again. However, if she gave low-quality explanation, she would be told or reminded of the dominant meaning of the metaphor. Then, a high quality explanation based on the dominant meaning was presented.

The 15 experimental stories were then presented through a ZEN X-Fi 16GB MP3 player. The stories were presented in randomized order to balance the practice effect. Identical procedures as those for the practice stories were carried out, except that only neural feedback was given.

Second interview. Identical procedures as in the initial interview were employed except that paraphrase task was replaced by the force-choice task. After listening to each story, the participant was immediately asked the force-choice question: 「故仔話, [人物] 係 [比喻], 即係佢 [該比喻的意思]/ [該比喻的相反意思]?」 ‘In the story, it was said that [story character] was [metaphor], did it mean he/she was [dominant metaphorical meaning] or [non-dominant metaphorical meaning]?’ All answers upon force-choice answers were accepted, followed by the explanation question (see Appendix C for the specific questions).

In both interviews, all responses were audio-taped by an INNOMAX DR 838 portable digital recorder. They were then transcribed orthographically by the author.

Scoring

As mentioned before, two dimensions of metaphor comprehension were considered, the metaphor meaning and the explanation. For the interpretation for the metaphor meaning,

responses in the paraphrase task were classified into four categories. Responses were scored as the first category when the participants gave no response. Irrelevant responses were scored as the second category. They were responses related to neither the metaphor meaning nor the story context. The third category included context-based responses. In general, these responses were related to the story context but showed no new information for direct metaphor interpretation. The category was not applicable to responses in the neutral condition as they were supposed to be free from the contextual effect. For the fourth category, participants provided the dominant and conventional metaphor meaning. For the force-choice task of metaphor meaning, the answers were scored either correct or incorrect. Responses matching the metaphor meaning rather than the context were marked correct. This was because metaphor itself was the only hint for the interpretation of the metaphor in the neutral condition.

For the explanation task, responses were classified into three categories. In the first category, the participants did not give any response. The second category included non-metaphor based explanations in which the responses only further elaborated the metaphor meaning indicated previously by appealing to the story or making up new materials. This type of answers demonstrated no awareness of connection between the metaphor and the meaning indicated previously. Only in the third category were metaphor-based explanations reflected the participants' awareness of such a relationship. These were explanations demonstrating a linkage between the metaphor meaning and the attributes of the terms in the metaphor, either fully or partially.

All responses were scored by the author. Ten percent of answers for each task were scored by another independent rater. The overall interrater reliability, as measured by percentage of agreement, was 94.4% on the paraphrase task, 100% on the force-choice task and 92.8% on the explanation task.

Results

Metaphor meaning

Paraphrase data. The percentage of answers in each scoring category in the three story conditions across the seven age groups was shown in Table 2. The irreverent responses constituted most of the pre-school children's response regardless of the story conditions. This type of responses decreased across the age groups and disappeared in the adults.

Context-based response showed fluctuating trends. Children at 4;06 showed highest percentage of context-based response among the child groups. Dominant-meaning responses showed a more gradual trend. To investigate the effect on age and story condition on the ability to give dominant interpretation for the metaphor meaning, dominant-meaning responses were particularly analyzed. Table 3 revealed the mean percentage and standard deviation of dominant-meaning responses across three story conditions and 7 age groups. Given the even number of participant in each group, a 7 (age) x 3 (story condition) two-way Analysis of variance (ANOVA) with repeated measure was conducted on dominant-meaning responses, with the age as between-group variable and story condition as within-group variable. Significant main effects of age [$F(6, 98) = 69.8, p < .05$] and story condition [$F(2, 98) = 9.31, p < .05$], and interaction between age and story condition [$F(12, 98) = 1.77, p < .05$], were obtained.

Table 2.

Percentage of Different Paraphrase Answers for Metaphor Meaning by Age and Story

<i>Condition</i>					
Age	Story condition	Response category			
		1 (no response)	2 (irrelevant)	3 (context based)	4 (dominant meaning)
4;00	Congruent	12.5	47.5	22.5	17.5
	Neutral	5	90	-	5
	Incongruent	5	70	20	5
4;06	Congruent	2.5	45	35	17.5
	Neutral	40	60	-	.00
	Incongruent	22.5	37.5	37.5	2.5
5;00	Congruent	7.5	30	27.5	35
	Neutral	5	72.5	-	22.5
	Incongruent	2.5	60	20	17.5
6;00	Congruent	15	20	10	55
	Neutral	15	40	-	45
	Incongruent	25	22.5	22.5	30
7;00	Congruent	5	7.5	5	82.5
	Neutral	12.5	12.5	-	75
	Incongruent	30	10	32.5	27.5
8;00	Congruent	.00	.00	.00	100
	Neutral	.00	5	-	95
	Incongruent	2.5	5	25	67.5
adult	Congruent	.00	.00	.00	100
	Neutral	.00	.00	-	100
	Incongruent	.00	.00	15	85

Table 3.

Mean Percentage and Standard Deviation of Dominant-meaning Responses (i.e. Type 4) by Age and Story Condition in the Paraphrase Task for Metaphor Meaning

Story Condition	Age						
	4;00	4;06	5;00	6;00	7;00	8;00	Adult
Congruent	17.5 (22.5)	17.5 (12.8)	35.0 (17.7)	55.0 (23.3)	82.5 (16.7)	100 (.00)	100 (.00)
Neutral	5.00 (9.26)	5.00 (9.26)	22.5 (16.7)	45.0 (33.4)	75.0 (20.7)	95.0 (9.26)	100.0 (.00)
Incongruent	5.00 (9.26)	2.50 (7.07)	17.5 (16.7)	30.0 (26.2)	30.0 (18.5)	67.5 (26.0)	90.0 (10.7)

Figure 1 showed the interaction of age and story condition in answering paraphrase metaphor meaning questions. There was a general increase in performance towards older age explaining the significant main effect of age. Performance generally descended from congruent to neutral and lastly to incongruent conditions explaining the significant main effect of story condition. The significant interaction resulted from the fact that the performance difference between congruent and neutral conditions minimize with age and until it disappeared in adult group. Meanwhile, the performance difference between incongruent and the other two conditions increased from 4;06 to 7;00 groups and reduced again from 7;00 to adult groups. The greatest difference was observed in 7;00 group.

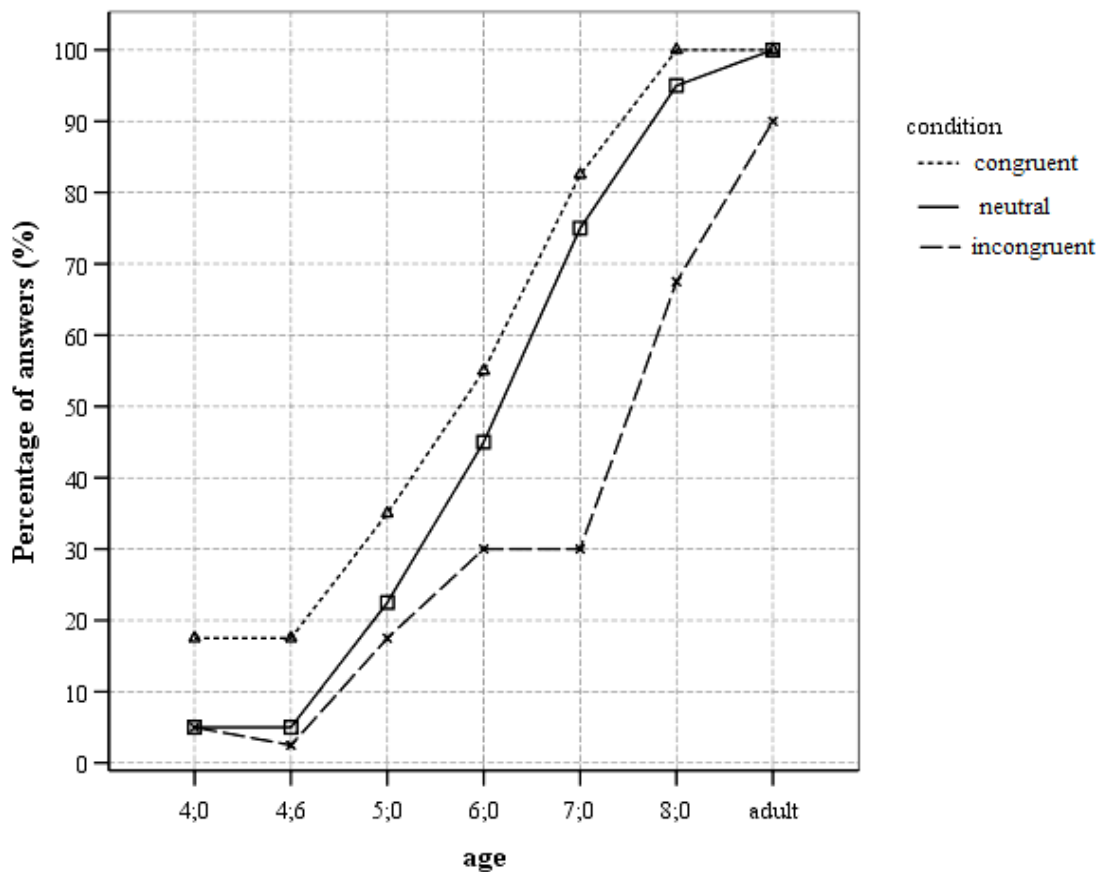


Figure 1. Interaction of age and story condition in paraphrase task.

Force-choice data. The percentage correct on the force-choice task across the seven age groups was shown in Table 4. There was a general increase in the percentage correct regardless of the story conditions. A 7 (age) x 3 (story conditions) two-way Analysis of variance (ANOVA) with repeated measure was conducted to analyze the data, with the age as between-group variable and story condition as within-group variable. Significant main effects of age [$F(6, 98) = 19.2, p < .05$] and condition [$F(2, 98) = 76.1, p < .05$], and interaction between age and condition [$F(12, 98) = 1.87, p < .05$], were also obtained.

Table 4.

*Mean Percentage and Standard Deviation on the Force-choice Tasks by Age and Story**Condition*

Condition	Age						
	4;00	4;06	5;00	6;00	7;00	8;00	Adult
Congruent	70.0 (21.4)	85.0 (14.1)	87.5 (14.9)	95.0 (14.1)	100 (.00)	97.5 (7.07)	100 (.00)
Neutral	57.5 (12.8)	57.5 (12.8)	67.5 (14.9)	85.0 (14.1)	85.0 (14.1)	92.50 (14.9)	100 (.00)
Incongruent	35.0 (14.1)	40.0 (21.4)	50.0 (15.1)	55.0 (17.7)	57.5 (16.7)	75.0 (31.161)	90.0 (10.7)

Figure 2 illustrated the interaction between age and condition in the force-choice task. Again, there was an increase in performance with age accounting for the significant main effect of age. The significant main effect of story condition can be revealed in the descending performance from congruent to neutral and lastly to incongruent conditions. The interaction resulted from the fact that performance differences in the three story conditions were different in various age groups. The discrepancy between the performance in congruent and neutral conditions was comparatively larger in the three youngest groups than the older groups, due to the remarkable improvement in neutral condition started from 6;0 group. Among the three youngest groups, the 4;0 group old showed more similar performance in congruent and neutral conditions. Besides, more obvious improvement in incongruent condition was also observed in 8;0 and adult group. The adult group performed equivalently perfect in the congruent and neutral conditions and nearly perfect in incongruent condition.

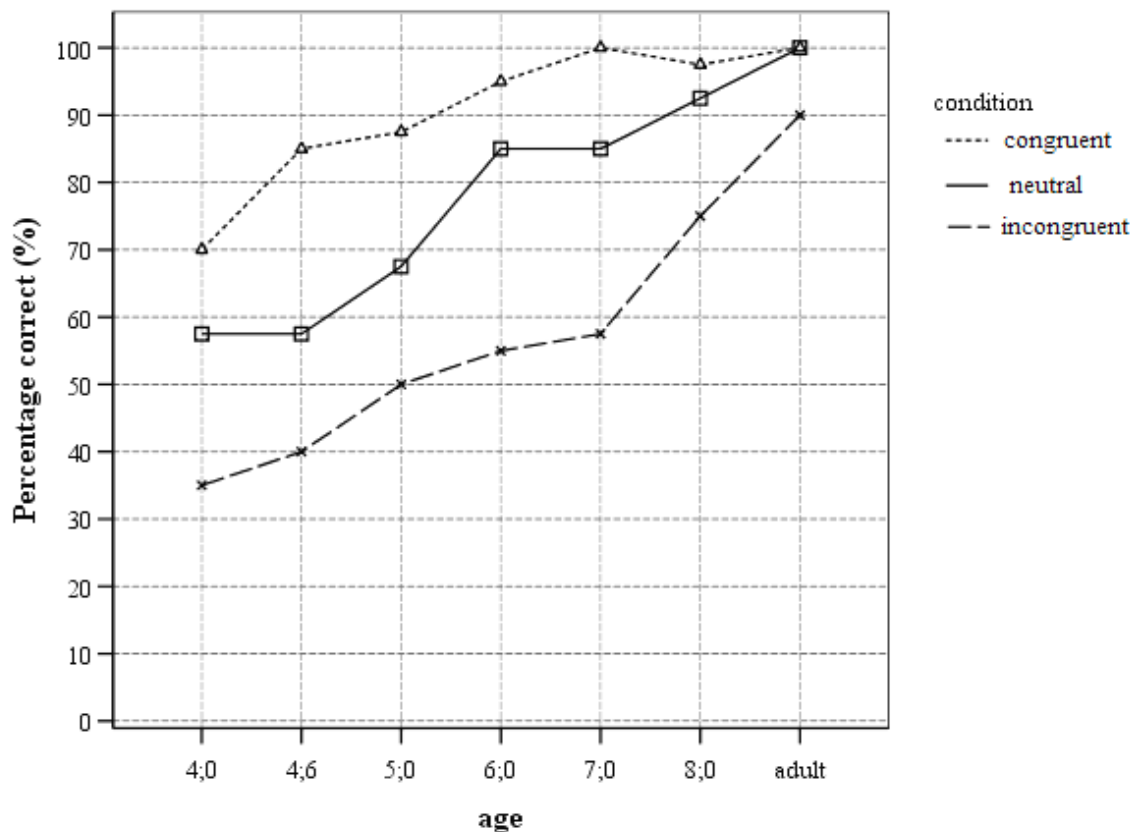


Figure 2. Interaction of age and story condition in the force-choice task.

Explanation

Explanation data was obtained from the two separate interviews. The analysis below only focused on the explanation of metaphor meaning given in the force-choice task rather than paraphrase task. This was due to the fact the participants in the three youngest group predominantly provided no or irrelevant responses (i.e. 77.2% in 4;0 group; 69.2% in 4;6 group; 59.2% in 5;0 group) for metaphor meaning in paraphrase task. The large proportion of such low-quality responses led to failure in further investigation of their explanation.

The percentage of answers in each scoring category in the three story conditions across the seven age groups was summarized in Table 5. The non-metaphor based explanations constituted most of the response in children at 4;0 to 6;0, regardless the story conditions. This type of responses decreased from 7;0 and disappeared in the adults. Meanwhile,

metaphor-based explanation was the most dominant type of responses in the 7;0; 8;0 and the adult groups, with the occurrence increased with age. To investigate the effect on age and story condition on the ability to articulate the relationship between the metaphor and the meaning chosen, metaphor-based responses were particularly analyzed. Table 6 revealed the mean percentage and standard deviation of metaphor-based responses across three story conditions and 7 age groups and Figure 3 was the graphical presentation revealing the relationship between percentage of metaphor-based explanations with age and condition. A 7 (age) x 3 (conditions) two-way Analysis of variance (ANOVA) with repeated measure was conducted on Category 3 responses. Significant main effects of age [$F(6, 98) = 65.8, p < .05$] and condition [$F(2, 98) = 39.7, p < .05$] were obtained. Interaction between age and condition was marginally insignificant [$F(12, 98) = 3.35, p = 0.064$]. Follow-up multiple comparisons using Scheffe test indicated that 4;00, 4;06, 5;00 groups gave similar number of metaphor-based responses. A significant increase in the number of responses were found from 6;00 to 8;00 groups in which response in 8;00 group was close to the adult group. Performance in the congruent and neutral conditions was similar, but both were significantly better than the incongruent condition.

Table 5.

Percentage of Different Explanation Categories by Age and Story Condition

Age	Condition	Response Category		
		1 (no response)	2 (non-metaphor based)	3 (metaphor-based)
4;00	Congruent	10.0	90.0	.00
	Neutral	2.50	95.0	2.50
	Incongruent	2.50	97.5	.00
4;06	Congruent	30.0	35.0	35.0
	Neutral	40.0	57.5	2.50
	Incongruent	25.0	75.0	.00
5;00	Congruent	10.0	82.5	7.50
	Neutral	2.50	92.5	5.00
	Incongruent	2.50	95.0	2.50
6;00	Congruent	7.50	72.5	20.0
	Neutral	5.00	75.0	20.0
	Incongruent	7.50	75.0	17.5
7;00	Congruent	12.5	22.5	65.0
	Neutral	15.0	15.0	70.0
	Incongruent	22.5	32.5	45.0
8;00	Congruent	.00	.00	100
	Neutral	.00	7.50	92.5
	Incongruent	10.0	10.0	80.0
Adult	Congruent	.00	.00	100
	Neutral	.00	.00	100
	Incongruent	7.50	.00	92.5

Table 6.

*Mean Percentage and Standard Deviation of Metaphor-based Explanations by Age and Story**Condition*

Condition	Age						
	4;00	4;06	5;00	6;00	7;00	8;00	Adult
Congruent	.00	.00	7.50	20.0	62.5	100	100
	(.00)	(.00)	(14.9)	(32.1)	(34.5)	(.00)	(.00)
Neutral	2.50	2.50	5.00	20.0	70.0	92.5	100
	(7.07)	(7.07)	(14.1)	(26.2)	(26.2)	(10.4)	(.00)
Incongruent	.00	.00	2.50	17.50	44.00	80.0	92.5
	(.00)	(.00)	(7.07)	(24.9)	(33.4)	(10.4)	(10.4)

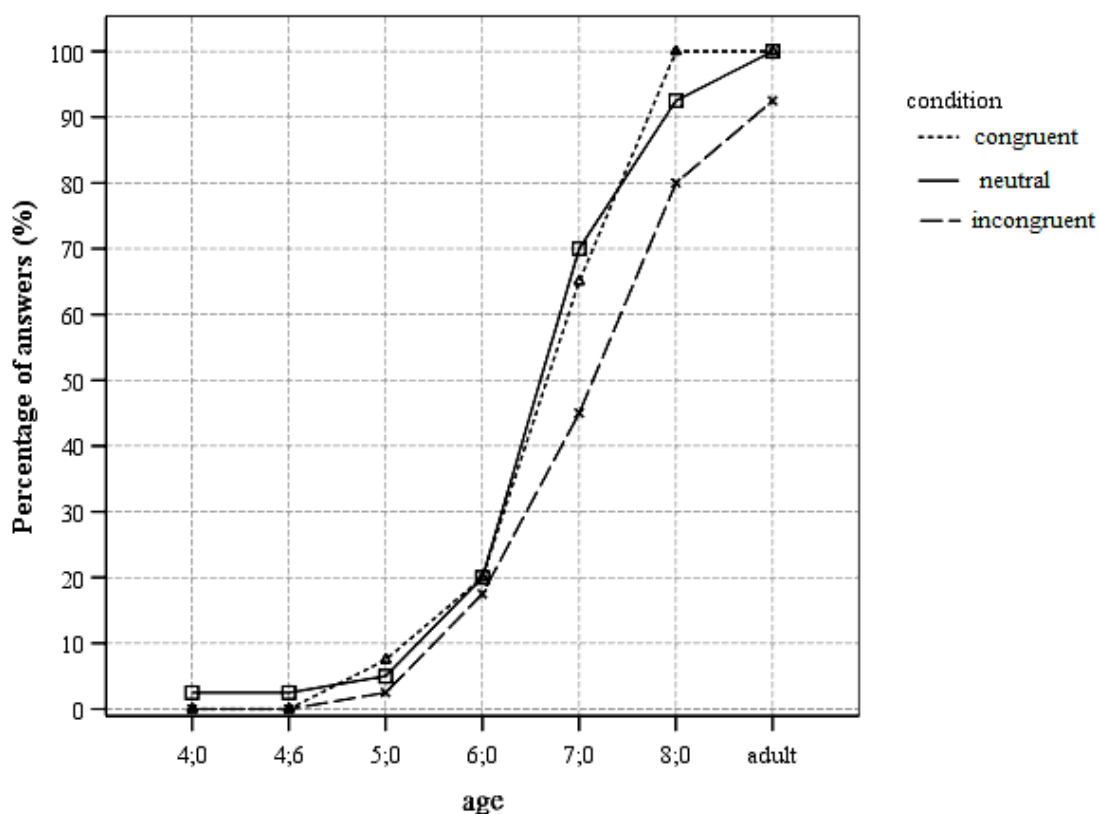


Figure 3. Percentage of metaphor-based explanations across age and story condition.

Metaphor-based explanations matching non-dominant metaphor meaning. To investigate to the flexibility of participants to shift metaphorical meaning based on contextual clues, the number of metaphor-based explanation matching the non-dominant metaphor meaning (chosen in the previous force-choice task) in incongruent condition was analyzed. Figure 4 shows the relationship between the proportion of explanation and age. Interestingly, an inverted V-shape curve was obtained. The youngest four age groups (aged 4;00 to 6;00) failed to give any metaphor explanation based on non-dominant metaphor meaning. The proportion of responses continued to increase in 7;00 group (17.6%) and 8;00 group (55.6%), and dropped in the adult group (25.0%).

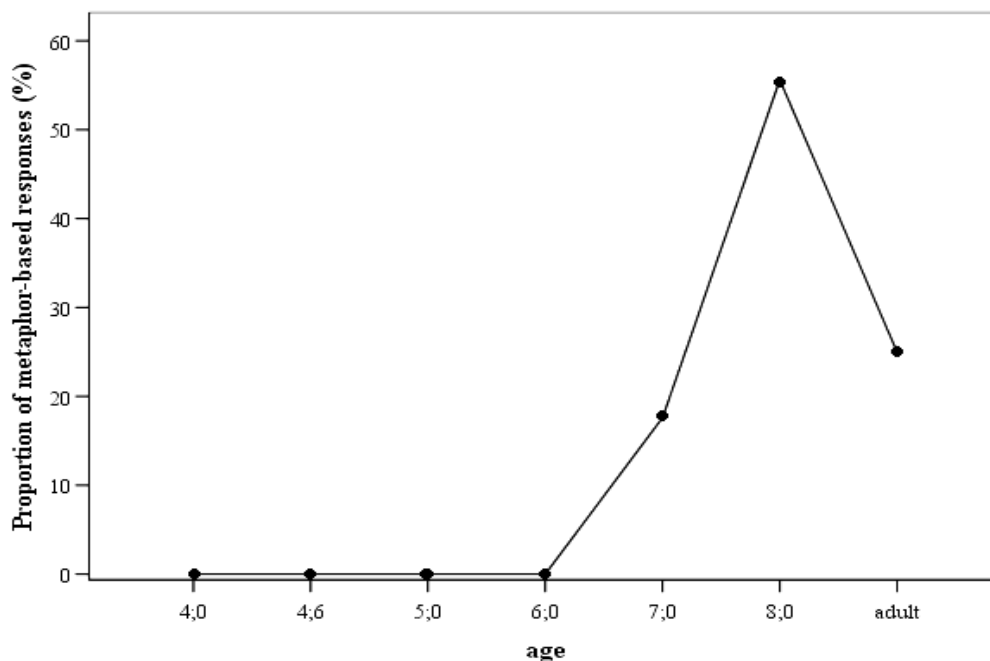


Figure 4. Percentage of metaphor-based explanations matching non-dominant metaphor meaning in incongruent condition across age.

Discussion

Comparison of the modes of testing

The paraphrase task and the force-choice task were employed to assess comprehension of metaphor meaning. However, the present study evidenced that the paraphrase task might

not be a very valid measure for the study purpose. Children in the younger groups demonstrated difficulty in reflecting their understanding in the paraphrase task. They frequently provided context-base responses in which a majority was circumlocution around the ground by addressing the story context, without concretely pointing out the metaphor meaning. This suggested that a meta-linguistic and linguistic demand more than those required for comprehension alone had probably been imposed in the paraphrase task (Levorato & Cassiari, 1995). Thus, even failure in paraphrasing could not evidence breakdown in metaphor comprehension in the young children.

However, such a task might still yield interesting information in the metaphor processing of a speaker. Qualitative inspection revealed that some school age children provided literal interpretation of metaphors in the paraphrase task when the metaphors were presented in the neutral context. This reflected that the paraphrase task in which participants were given opportunity to respond spontaneously could in fact provide more insight on metaphor processing, provided that the participants had certain level of metalinguistic skills and linguistic knowledge to reflect their understanding. Therefore, the paraphrase task might be a recommendable testing mode for examining mature language learners who showed a certain level of language proficiency and meta-linguistic skills such as second language learners rather than first language acquisition in young children. Corroborating this point was the much less obvious contextual influence observed in the paraphrase task than the force-choice task among the younger groups. Additional linguistic and meta-linguistic demand had probably constrained some young children from performing better in the facilitative context. Due to the poor validity of in measuring understanding of metaphor meaning and demonstrating the contextual influence across age, the discussion below would focus on the result obtained in the force-choice task.

The effect of age on metaphor understanding

One motivation of the present study was to identify the age of onset of metaphor understanding in Cantonese-speaking children. Since metaphors were often presented in relevant contexts in daily conversation, the performance in congruent condition might well represent children's metaphor comprehension ability. Using a 70% accuracy as the acquisition criterion, it was found that even the youngest children at age 4 was able to indicate metaphor meaning upon a force-choice task when a facilitative linguistic context was provided. In order to control for the sole contribution of the facilitative context, it is worthwhile to examine the performance in the neutral condition (Waggoner, et al., 1997). Again, using the 70% acquisition criterion, children were found to successfully comprehend metaphors out of contextual clues at age 5 upon a force-choice task but the metaphor-based explanation only emerged at age 7. The findings are coherent to our hypothesis generated from Waggoner et al.'s (1997) study that the ability to indicate metaphor meaning upon a force-choice task did emerge in children younger than 6 or 7, even without strong facilitative contextual support.

Not surprisingly, a progressive developmental trend of metaphor understanding was observed. Ability to interpret metaphor meaning and provide explanation of their understanding did improve from the early childhood to school years and continue to adulthood. Specifically, when children enter school at 6, their ability to interpret dominant metaphor meaning even without contextual support improved sharply (as illustrated in Figure 2). Meanwhile, more and more metaphor-based explanations were provided by children at primary school level (as illustrated in Figure 3) which further illustrated their improved metaphor understanding. The significant improvement when entering into school age could be explained by the remarkable increased exposure of figurative language such as metaphors

in the language context in schools (Marilyn, Nippold, & Taylor, 1995; Norbury, 2004). The considerable exposure of figurative language in classrooms such as children's textbooks and classroom discourses during school years provided an account to the abrupt leap in interpreting metaphor and providing explanation in age 6 and 7 when included children at Primary 1 and 2 respectively.

The effect of context on metaphor understanding

Consistent with previous findings, the present study clearly demonstrated the influence of context towards metaphor understanding in children. Children generally performed better in context congruent to metaphor meaning than out of context, which was further better than incongruent context. It was thus evidenced that a highly predictive context parallel to the metaphor meaning can support metaphor learning. On the other hand, a conflicting context hindered the children to see the dominant meaning of the metaphor.

Although a contextual influence had been identified, it should be noted that the magnitude of its influence in metaphor comprehension was not simply parallel to age as revealed in the interaction effect between story conditions and age. The effect was more obvious when the adult group was taken into account. A general trend of reduction in contextual influence across age was observed. Specifically, difference between performance in the congruent and neutral conditions reduced from nursery to school age children, while the adults even performed equivalently well in both conditions. Such a change probably reflected that children had acquired more metaphors and understood their dominant and conventional meaning when they grew older. Thus, they were less dependent on a predictive context to assist their metaphor understanding. However, when analyzed the three nursery groups in greater detail, the relationship between the facilitative context and metaphor comprehension was more complicated than expected. Benefits in the youngest group of age

4;0 was the most limited when compared with other age groups. This result was surprising as it was expected that younger children would demonstrate the largest discrepancy between the congruent and neutral conditions. That was, they might be more reliant on context for metaphor comprehension. This finding might be explained in terms of their insufficient linguistic and cognitive ability which constrained them from extracting meaning of a linguistic input from the linguistic contextual information (Olson & Hildyard, 1980).

The ability to shift metaphorical meaning based on contextual changes was also observed and increased with age (Waggoner et al, 1997). Children aged 7 started to provide explanation of the metaphor meaning from its non-dominant sense in the incongruent condition. For example, a 7-year-old child claiming that ‘家輝係一隻縮頭烏龜’ (Ka Fei was a turtle with its head pulled into its shell) meant ‘Ka Fei was brave’ explained her interpretation by saying that ‘a tortoise would not be afraid of anything when its whole body was pulled inside the shell’. However, such flexibility towards contextual changes significantly reduced in the adult group after the general increasing trend during childhood. When compared to work of Waggoner and his colleagues (1997), the reduced flexibility in adults in the present study was apparently in conflict with their findings and conclusion. Their study revealed that the adult group (with age and education level equivalent to the adults in the present study) gave the greatest number of explanation of metaphor meaning from a non-dominant sense. However, if analyzed in more detail, the performance in Cantonese adults was not surprising and very reasonable. The metaphors chosen in this study were not only of high dominancy and clarity in meaning, but also somehow idiomatic in sense. Adult speakers experienced abundant use of these idiomatic metaphors in daily life. So these metaphoric expressions become entries in their lexicon with a fixed and even frozen meaning (Abkarian, Jones & West, 1992; Liu, 2008). It was undoubted that they were very

unlikely to explain the metaphors in the non-dominant sense even when the context was contradictory with the conventional metaphor meaning since the non-dominant meaning did not make good sense to them.

Pedagogical implications

The present study highlighted the use of context in metaphor teaching in children. The findings confirmed the facilitative effect of linguistic context towards the understanding of metaphors. Therefore, incorporating metaphors in various linguistic contexts consistent to metaphor meaning can further assist the children to infer and grasp the metaphor meaning based on the contextual clues. This contextualized teaching strategy may be more rewarding than merely presented the decontextualized definitions or denotation of the metaphors at the outset of the teaching programme to the children. In addition, although children learn what they are taught, they can learn better if the teaching is introduced at the right time. It was noted that children at a very young age, i.e. 4;0 made limited use of the linguistic contextual information in the metaphor comprehension. Therefore, if metaphor learning is included in the formal syllabus, educators should consider putting it into pre-primary curriculum or above but not very young children in order to maximum their learning.

Limitations of the present study & future research direction

The present study identified that children demonstrated metaphor understanding under a facilitative context as young as 4 and without strong contextual support at 5. Although it seemed to support the hypothesis from Waggoner et al's (1997) study that metaphor understanding emerged earlier than 6 during which children were able to provide explanations, this finding could somehow be due to cultural differences. As comprehension of metaphors was reported to be culture-specific (Liu, 2002) and Chinese speakers had been described to experience high-context communication in which little information was

contained in words (Hall, 1981), they had to rely on every possible contextual clue to facilitate interpretation. With this daily experience, Chinese children were speculated to develop an inferencing skill in daily conversation with a faster rate. Therefore, it would be reasonable that an earlier metaphorical development found in the present study might be specific to Cantonese speakers. Therefore, it was worthwhile to replicate the study on pre-school age Western children. A cross-linguistic comparison would help to verify whether a different age of onset would be identified.

As discussed previously, most metaphors used in the present study were idiomatic in sense. This might have resulted in the reduced flexibility to explain metaphor meaning in non-dominant sense based on contextual changes in the adult group. This finding shed light on the possibility to replicate the study on purely non-idiomatic metaphors to offer a clearer evidence on the reliance on contextual information for metaphor understanding at different stages of language learning.

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Appendix A

Target metaphors and their dominant meaning

	Metaphor	Dominant meaning
Practice story	[人物一] 同 [人物二] 糖痲豆 The two <i>are beans stuck together by molasses.</i>	[人物一] 同 [人物二] 成日喺埋一齊 The two <i>always stay together.</i>
Experimental stories	[人物] 係 一隻落湯雞 Someone is <i>a chicken drowned in the soup.</i>	[人物] 濕晒 Someone gets <i>wet.</i>
	[人物] 係 一隻縮頭烏龜 Someone is <i>a turtle with its head pulled into its shell.</i>	[人物] 細膽 Someone is <i>timid.</i>
	[人物] 係 一隻花面貓 Someone is <i>a cat with patterns on its face.</i>	[人物] 塊面污糟 Someone's <i>face was dirty</i>
	[人物一] 見到 [人物二] 就螞蟻 摟蜜糖 One becomes <i>an ant adhering to the honey</i> when meeting someone.	[人物一] 好鍾意埋去 [人物二] 度 Someone <i>likes to get close to another person.</i>
	[人物] 就快溶 Someone is <i>going to melt.</i>	[人物] 熱 Someone <i>feels hot.</i>

Note. The dominant meaning was determined by 15 adults who interpreted each metaphor incorporated the neutral context. Each metaphor attained over 90% percentage of consistent interpretation.

Appendix B

Stories of each metaphor in different story conditions

Metaphor		Story condition		
		Congruent	Neutral	Incongruent
Practice story	糖痴豆	--	小美同玲玲係花花幼稚園返學， 小息既時候，佢地成日都糖痴豆	--
Experimental stories	落湯雞 a chicken drowned in the soup	今朝落大雨，但小玉唔記得帶遮，又冇著雨褸，返到學校，同學話佢係一隻落湯雞。 It rained heavily this morning but Siu Yuk forgot to bring her umbrella and wear her raincoat. When she arrived at school, her classmates said that she was <i>a chicken drowned in the soup</i> .	每朝返到學校，小美都會同老師講早晨，今日老師一見到小美，就話小美係一隻落湯雞。 Siu Mei greets her teachers when she arrives at school every morning. Once a teacher saw Siu Mei this morning, she said that Siu Mei was <i>a chicken drowned in the soup</i> .	今朝天氣好涼爽，小明坐校車返學，一返到學校，同學指住佢，話佢係一隻落湯雞。 It was cool today. Siu Ming took the school bus to school. Once he arrived at school, his classmate pointed at him and said that he was <i>a chicken drowned in the soup</i> .

Metaphor		Story condition		
		Congruent	Neutral	Incongruent
Experimental stories	縮頭烏龜	今日，小美見到同學蝦佢細佬，但小美唔敢同老師講，佢真係一隻縮頭烏龜。	係學校度，玲玲見到同學蝦佢細佬，返到屋企，媽咪話玲玲係一隻縮頭烏龜。	今日，家輝見到同學蝦佢妹妹，即刻上前教訓嗰個同學，家輝真係一隻縮頭烏龜。
	花面貓	美勞堂既時候，家輝好論盡，將d顏料周圍揩，俾老師話佢係一隻花面貓。	每朝返到學校，卓耀都會同學玩，今日一返到去，同學都指住佢，話佢係一隻花面貓。	小明好鍾意乾淨，每朝都洗完面先返學，今日返到學校，老師話佢係一隻花面貓。
	螞蟻摟蜜糖	王老師好好人，好錫小朋友，小朋友一見到佢就螞蟻摟蜜糖。	喺學校度，同學每次一見到張老師就螞蟻摟蜜糖。	李老師好惡，成日罰小朋友，小朋友一見到佢就螞蟻摟蜜糖。
	就快溶	今日好曬好猛太陽，街上既人都流晒汗，小美著住好多衫返學，佢就快溶啦。	無論天氣好唔好，傑傑都會行路返學校，今日，佢行到就快溶啦。	今日好大風，街上既人都不停打冷顫，但俊俊唔記得著褸返學，佢就快溶啦。

Appendix C

Questions of each story in different tasks

	Metaphor	Type of task		
		Paraphrase (1)	Force-choice (2)	Explanation (3)
Practice	糖痴豆	故仔話, 小美同玲玲成日糖痴豆, 即係咩意思?	故仔話, 小美同玲玲成日糖痴豆, 即係佢地成日一齊定唔一齊?	點解話兩個人糖痴豆等於佢地 [<u>(1)/(2) 的答案</u>]?
Experimental	落湯雞 <i>a chicken drowned in the soup</i>	故仔話, (故事中的人物) 係一隻落湯雞, 即係咩意思? In the story, it was said that (story character) was a chicken drowned in the soup, what did it mean?	故仔話, (故事中的人物) 係一隻落湯雞, 即係佢個身係乾定濕? In the story, it was said that (story character) was a chicken drowned in the soup, did it mean that her body was dry or wet?	點解話一個人係一隻落湯雞等於佢 [<u>(1)/(2) 的答案</u>]? Why does calling someone a chicken drowned in the soup mean that they were [<u>the answer provided previously in (1)/(2)</u>]?
	縮頭烏龜	故仔話, (故事中的人物) 係一隻縮頭烏龜, 即係咩意思?	故仔話, (故事中的人物) 係一隻縮頭烏龜, 即係佢細膽定勇敢?	點解話一個人係一隻縮頭烏龜等於佢地 [<u>(1)/(2) 的答案</u>]?

Metaphor		Type of task		
		Paraphrase (1)	Force-choice (2)	Explanation (3)
Experimental	螞蟻摟蜜糖	故仔話, 同學見到老師就螞蟻摟蜜糖咁, 即係咩意思?	故仔話, 同學見到老師就螞蟻摟蜜糖咁, 即係同學鍾唔鍾意意埋去老師度?	點解話見到一個人就螞蟻摟蜜糖咁, 等於我哋 (<u>(1)/(2) 的答案</u>)?
	就快溶	故仔話, (故事中的人物) 就快溶, 即係咩意思?	故仔話, (故事中的人物) 就快溶, 即係佢凍定熱?	點解話一個人就快溶於佢 (<u>(1)/(2) 的答案</u>)?
	花面貓	故仔話, (故事中的人物) 係一隻花面貓, 即係咩意思?	故仔話, (故事中的人物) 係一隻花面貓, 即係佢塊面乾淨定污糟?	點解話一個人係一隻花面貓等於佢 (<u>(1)/(2) 的答案</u>)?