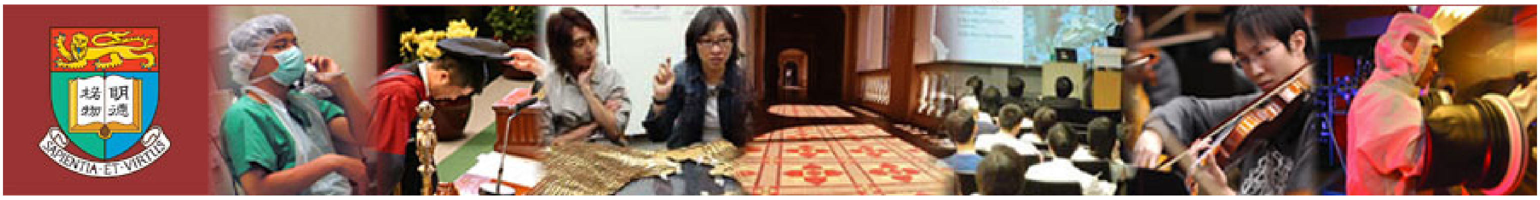

Comprehension of Noun Phrase in

Cantonese-speaking Preschool Children

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Abstract

This study investigated Cantonese-speaking preschoolers' abilities in noun phrase comprehension. One hundred and sixty preschool children aged 2 to 6 years with normal language development undertook a comprehension task. They were instructed to point to the target picture, which matched with the noun phrase presented auditorily among three or four distractors. The results showed age-related difference in preschoolers' comprehension ability of noun phrase and continuous development was noted before the age of 4. Significant effect of number of elements was found, which supported the use of number of contrastive elements in phrases/sentences in discriminating children with language delay of more than 1 year in current clinical practice. The present study also pinpointed that number of concepts would affect preschooler's ability in noun phrase comprehension. The present findings could be regarded as protocol basis for developing an assessment tool for testing comprehension ability of noun phrase in Cantonese-speaking preschool children.

Language comprehension means interpreting and making sense of spoken or written language (Miller & Paul, 1995). It involves lexical knowledge (associating words to objects and events), semantic & syntactic knowledge (decoding the relationships among words and understanding the ideas of the sentence) and also knowledge at discourse level (understanding the meaning of words beyond the literal level) (Miller & Paul, 1995).

Children's knowledge in these three aspects is different at different ages (Berk, 1991). Children around one to two years old have small vocabulary size, produce some early word combinations and begin to understand other's speaking intention while children around five years old have large vocabulary size, use complex sentences and develop referential communication skills (Berk, 1991; Miller & Paul, 1995). Speech therapists need to refer to developmental norms of different studies because in clinical practice, children are assessed and compared with age-matched peers for identification of language delay/ disorder and for design of appropriate intervention goals and procedures (Paul, 2001).

Both standardized and non-standardized assessments may be carried out to decide if children's language skills are similar to age-matched peers. In standardized assessments, language tests like Cantonese Receptive Vocabulary test (CRVT) (Lee, Lee, & Cheung, 1996) and Reynell Developmental Language Scale (RDLS) (Reynell & Huntley, 1985) are used. In non-standardized assessments, specific concepts such as color and spatial terms are assessed to find out the child's particular weakness (Paul, 2001). There are studies on acquisition of individual concept, for example, question words (Bloom, Merkin, & Wotten, 1982; James, 1990; Tyack & Ingram, 1977), color concept (Johnson, 1982; Soja, 1994), and spatial concept (Chin, 1996; Wanska, 1984). Opper (1996) has investigated Hong Kong preschool children's acquisition of concepts including pictorial concepts (e.g. fat/thin, clean/dirty) and concepts involved in concrete situations (e.g. sorting of different colors). Normative data of concepts are available for the use in clinical practice.

In both standardized and non-standardized assessments, if concepts are involved, they are put in a noun phrase of a sentence. For example, in RDLS (Reynell & Huntley, 1985), concepts are embedded in noun phrase which are assessed in the form of sentence (e.g. give me the yellow pencil). In Assessment of Children's Language Comprehension (ACLC) (Foster, Giddan, & Stark, 1983), different modifiers such as color, size and number are attached to the nouns and most of these modified nouns are also presented in the form of verb phrase (e.g. eating the big apple) and declarative sentences (e.g. clown is eating the big apple). Usually a few concepts were selected in certain form of sentences/ phrases. In the non-standardized procedures suggested by Miller & Paul (1995), different concepts are attached to nouns which are put in the form of sentence (e.g. (Size) Give the little boy a big ball, (Locative) The candy is in the mailbox). Though there is normative data on concepts as stated above, there is no normative data on children's comprehension of noun phrases. In English and Cantonese, the noun phrase structures are slightly different. This may result in different acquisition rate or pattern which deserves investigation.

In English, a noun phrase consists of head, determinative, premodification and postmodification (Quirk, Greenbaum, Leech, & Svartvik, 1985). For example, "the big car outside the station" where the head is "car", determinative is "the", premodification is "big" and "outside the station" is the postmodification.

According to Matthews & Yip (1994), a noun phrase in Cantonese consists of a noun and items used to accompany or modify it. The order of elements of a noun phrase should be as follows (Matthews & Yip, 1994, p.88):

e.g. go2	loeng5	go3	daai6	ge3	bo1
"Demonstrative	numeral	classifier	adjective	(ge)	noun"
these	two	classifier	big	function word marker	balls
"these	two		big		balls"

In Cantonese, ge is a function word marker, which is used to make pronominal modification to be seen as possessives and relative clauses (Matthews & Yip, 1994).

The noun phrase structure in Cantonese is similar to that in English whereas the noun always comes at the end of the phrase (Matthews & Yip, 1994), i.e. postmodification is not present in Cantonese. Besides, relative clauses exist in Cantonese, which can modify the noun phrase (Matthews & Yip, 1994). However, "relative clauses in Chinese have the reverse order of the English: the head noun comes at the end, as in all noun phrases" (Matthews & Yip, 1994, p.109). The order in Cantonese is presented as follows (Matthews & Yip, 1994, p.109):

e.g.	ling1	zyu3	sai6	bo1	ge3	naam4 zai2
	"relative clause				ge	noun"
	holds	aspect marker	small	ball	function word marker	boy

"the boy who is holding the small ball"

whereas relative clause in English follows the noun (e.g. the car that stood outside the station) (Quirk, Greenbaum, Leech, & Svartvik, 1985, p. 1239).

Noun phrases in this study were formed according to the above structure stated in Matthews & Yip (1994). Simple nouns (e.g. "jyn4 bat7" pencil), adjective-noun phrases (e.g. "ceung4 ge3 jyn4 bat7" long pencil), and adjective-adjective-noun phrases (e.g. "hou2 siu2 ceung4 ge3 jyn4 bat7" a few long pencils) were included in this study. In testing comprehension, speech therapist will vary the concept and the noun. For example, in the noun phrase "ceung4 ge3 jyn4 bat7" (long pencil), concept "long" and noun "pencil" may be contrasted with concept "short" and noun "ruler" respectively. Therefore, each variable is contrasted and this noun phrase is said to have two variables called "contrastive elements". There is no normative data on the effect of contrastive elements on comprehension ability of preschoolers, which is useful for identification of delay in comprehension ability in clinical practice, so noun phrases with different number of contrastive elements worth for investigation.

Apart from number of contrastive elements, according to Opper (1996), the number of individual concepts acquired increases with age. As different concepts could be embedded in noun phrases, older children who have acquired more concepts will perform better in noun phrase comprehension than younger children who have acquired less. So, it is hypothesized that number of concepts acquired will also be related to children's performance in noun phrase comprehension.

In noun phrases with same number of elements, number of concepts could also be varied. For example, noun phrases "long/short pencil/ruler" and "a few/many long/short pencils" are both considered as 2-element noun phrases. The former example has only one concept (long/short) because the object (pencil/ruler) is contrasted. But in the latter example, two concepts (a few/many and long/short) are included because the object "pencils" is not contrasted.

Therefore, the number of concepts is different even within noun phrases having the same number of contrastive elements. As stated in Opper (1996), older children acquired more concepts. It is postulated that number of concepts in noun phrase of the same number of element will affect the comprehension ability. Therefore, noun phrases with varying number of concepts were also made up in this study to test for the age-related difference.

Purpose of the Present Study

Owing to the lack of normative data for preschool children's comprehension ability of noun phrase in Cantonese, the present study aimed at

1. exploring the age-related and gender differences in comprehension of noun phrase,
2. studying the effect of number of elements in comprehension of noun phrase in preschool children,
3. exploring the effect of the number of concepts in comprehension of noun phrase and
4. investigating the relationship between number of individual concepts acquired and noun phrase comprehension.

Method

Subjects

A total of 160 preschool children attending normal nursery were recruited. Subjects were divided into eight six-month age bands between two and six years: 2;1-2;6, 2;7-3;0, 3;1-3;6, 3;7-4;0, 4;1-4;6, 4;7-5;0, 5;1-5;6 and 5;7-6;0. Each group included 20 children, ten boys and ten girls. The subjects were from three local nurseries, two in Hong Kong Island and one in Kowloon. All subjects were native speakers of Cantonese and use Cantonese mainly in daily life. Children with speech, language, intellectual and hearing impairment were excluded from this study.

Materials

A total of 85 items was used to assess the subject's ability in comprehension of noun phrases. Each item included four or five test pictures with clear black and white line-drawings and colored only when color concept was tested.

Noun phrases with different concepts mastered between the age of two and six according to Opper (1996) were generated (see Appendix A) by the experimenter according to the noun phrase structure as stated in the introduction. The objects/concepts chosen in this study must be able to put on picture and were common vocabulary.

Each target noun phrase was presented with three to four distractors on an A4 paper. The targets and distractors were formed primarily depending on the number of contrastive elements (variables) within each noun phrase to ensure that there was enough distraction for the "contrastive elements" involved.

For example, in noun phrase "hung4 sik7 ge3 faa1" (red flower), in order to have two contrastive elements, concept "hung4 sik7" (red) and noun "faa1" (flower) may be contrasted with "wong4 sik7" (yellow) and "bo1" (ball) respectively. So, comprehension of the noun phrase “red/yellow flower/ball” may be tested using four colored pictures, red flower, yellow flower, red ball and yellow ball.

Similarly, in another noun phrase “hou2 do1 daai5 ge3 ping4 gwo2” (a lot of big apple), in order to have three contrastive elements, the concepts “hou2 do1” (a lot) and “daai1” (big) may be contrasted with “hou2 siu2” (a few) and “sai3” (small) respectively while the noun “ping4 gwo2” (apple) may be contrasted with “bo1” (ball). Comprehension of 3-element noun phrase “a lot of big apples” may be tested with three other pictures, a few big apples, a lot of small apples and a lot of big bananas, to provide enough distraction for the child. In this 3-element noun phrase, it is said to have two concepts and one object.

In another 3-element noun phrase, one concept but two objects (e.g. “ling1 zyu3 sai6 bo1 ge3 naam4 zai2” the boy who is holding the small ball) may be included. The concept “sai6” (small) may be contrasted with “daai1” (big) while the nouns “naam4 zai2” (boy) and “bo1” (ball) may be contrasted with “neoi5 zai2” (girl) and “ping4 gwo2” (apple) respectively. Though the above two examples are with three contrastive elements, the number of concepts and objects involved are different.

In some other cases, the same noun phrase may result in different number of elements if the number of distractors is different. For example, in trial 61 (3-elment noun phrase) and trial 84 (4-element noun phrase), the target “loeng5 ji1 ceung2 ge3 fyu1 sik7 bat7” (two long grey pen) was the same, but the number of contrastive elements and also the number of distractors were different. In order to have enough distraction, each variable was contrasted, i.e. “two” versus “one”, “long” versus “short”, “grey” versus “pink” and “pen” versus “candle”. In trial 61, only the concepts (two, long and grey) varied but not the noun in the distractors whereas in trial 84, the noun (pen) varied also with the concepts (two, long and grey) in the distractors. Therefore, trial 61 is a 3-element noun phrase while trial 84 is a 4-element noun phrase.

The items were arranged from simple vocabulary to complex noun phrase structure and the number of concepts attached to the nouns varied from one to three depending on the number of contrastive element in the noun phrase. The concepts assessed in this study included size, color, quantity and adjectives acquired at the age of 2, 3, 4 and 5 (Opper, 1996). Concepts were combined by using a concept from one age group, such as age 2, to other age groups such as age 3. So, different combinations were formed, for example, 22, 23, 24, 25, 33, 34 and etc. Relative clauses embedded with different concepts were also included (e.g. Trial 38. “ling1 zyu3 sai6 ping4 gwo2 ge3 go1 go1” the boy who holds small apple).

Procedure

A comprehension task was carried out. The test was conducted in the nurseries and subjects were tested individually by two Cantonese-speaking experimenters. All the testings were videotaped with parents’ consent. According to Miller & Paul (1995), children aged two start to respond well to picture-pointing task. Therefore, subjects were required to follow instruction to point to the target picture which matched with the noun phrase presented auditorily.

After the picture-choice task, a post-test on checking the pre-modifier of noun phrase was conducted (see Appendix B). It aimed at assessing comprehension of concepts only.

Data analysis

The score of noun phrase comprehension and pre-modifier check obtained by each subject was recorded by the experimenter during the task and then counted manually.

Another final year student who was not involved in this study transcribed 10% of the data and inter-rater reliability was 99.94%.

Result

Effect of Age, Gender & Number of Elements

The mean percentage scores in different number of elements obtained by preschoolers in eight age groups are summarized in Table 1 to show the ability in noun phrase comprehension in relation to number of elements.

Table 1. *Mean percentage score in different number of elements in noun phrase comprehension*

Age group		Overall percentage score in Noun Phrase Mean (SD) (%)	Mean percentage score in different number of elements Mean (SD) (%)			
			1	2	3	4
1	2;1-2;6	44.60 (9.79)	86.56 (16.26)	43.81 (15.88)	33.75 (9.36)	28.13 (11.93)
2	2;7-3;0	51.82 (7.75)	94.06 (6.56)	50.24 (9.95)	42.29 (14.39)	34.58 (10.65)
3	3;1-3;6	62.00 (9.33)	97.50 (4.25)	61.67 (13.69)	53.96 (15.85)	46.67 (14.22)
4	3;7-4;0	70.47 (8.01)	99.06 (3.06)	70.24 (10.58)	65.83 (10.87)	56.25 (12.57)
5	4;1-4;6	79.12 (6.88)	97.81 (3.06)	77.62 (9.66)	76.46 (9.87)	70.63 (12.72)
6	4;7-5;0	83.82 (6.50)	99.38 (1.92)	82.62 (8.22)	82.29 (9.64)	76.04 (11.06)
7	5;1-5;6	86.41 (5.37)	99.38 (1.92)	85.49 (5.46)	84.17 (8.40)	80.83 (10.06)
8	5;7-6;0	84.35 (5.33)	98.75 (2.56)	83.57 (6.82)	82.71 (7.31)	77.08 (11.35)

In noun phrase comprehension, the subject's performance did not reach 90% in the oldest age group. The scores within each age group decreased with increasing number of elements.

An 8 (age) × 2 (gender) × 4 (number of element) three-way Analysis of variance (ANOVA) with repeated measure was conducted, in which age (eight levels: 2;1-2;6, 2;7-3;0, 3;1-3;6, 3;7-4;0, 4;1-4;6, 4;7-5;0, 5;1-5;6 and 5;7-6;0) and gender (two levels: male and female) were between-group variables and number of element (four levels: 1 to 4) was within-group variable. Three-way ANOVA was computed for investigating the age-related difference, gender effect and effect of number of elements on noun phrase comprehension.

Significant main effect of age [$F(7, 144) = 81.88$, $p=0.000$] was found with the subjects' overall performance in comprehension of noun phrase improved across the age groups (Table 1). Tukey's Honestly Significant Difference (HSD) procedure was used to identify the sources of significant difference. The significant age effect was attributed to the four youngest age groups (Age 2 to 4 years) who performed significantly poorer than the four older age groups (Age 4 to 6 years) ($p<.05$). No statistically significant gender effect ($p>.05$) was found.

The main effect of number of element was statistically significant, $F(3, 432) = 648.05$, $p=0.000$. Tukey's HSD procedure was done and it was found that there was significant difference between different number of elements. Results in Table 1 showed that all subjects performed better on 1-element noun phrases. Performances across different number of elements in different age groups varied. This would be further explained in terms of interaction effect between age and number of elements. A statistically significant interaction effect between age and number of elements [$F(21, 432) = 18.25$, $p=0.000$] was found (Figure 1).

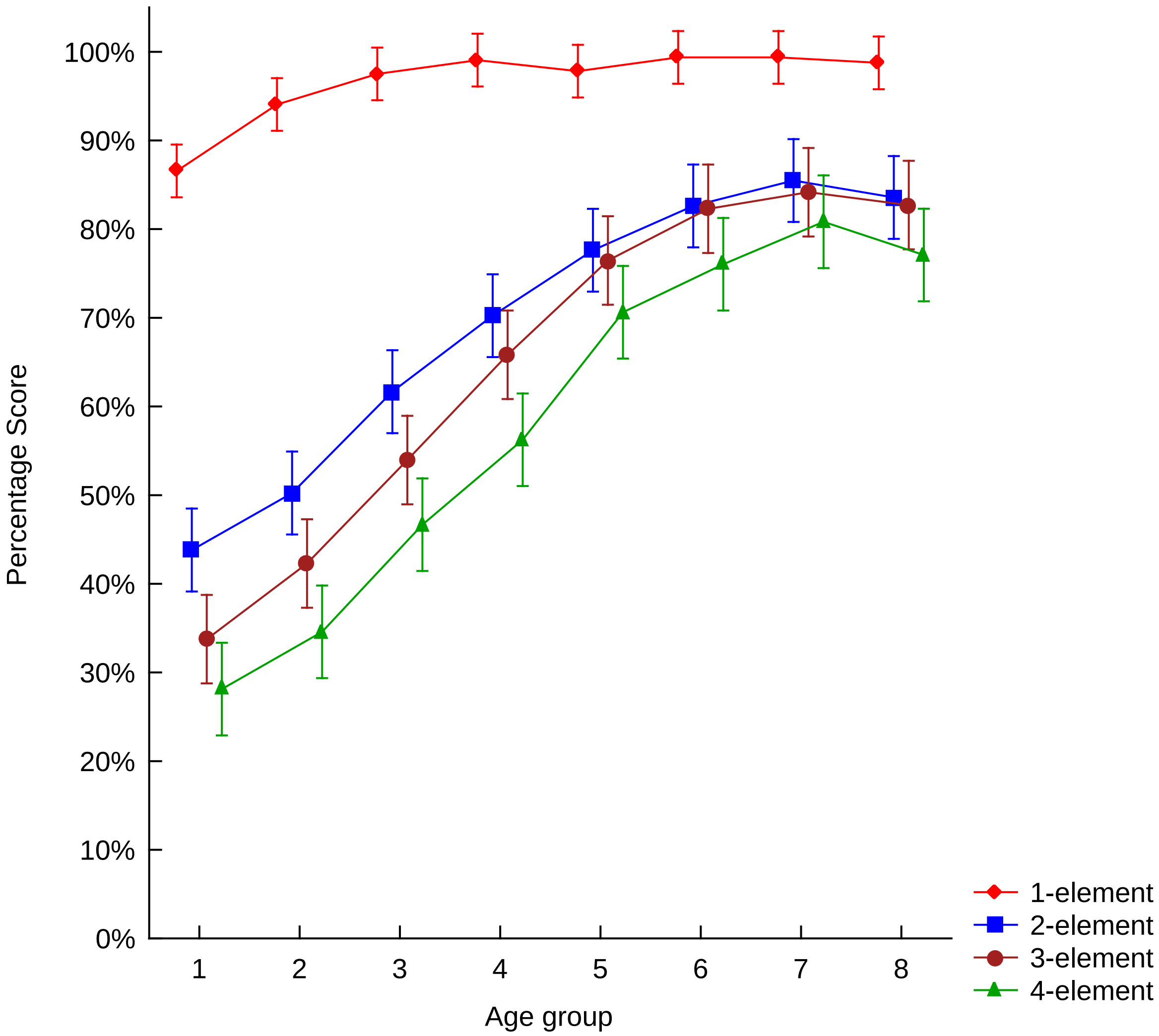

Figure 1. Interaction of age and number of element

Tukey's HSD procedure was conducted to identify the source of interaction. It was found that all subjects did not perform differently in 1-element noun phrase ($p>.05$), but their performance in noun phrases with 2 to 4 elements improved across age groups as shown in Figure 1. Results of post-hoc comparisons under the condition of 2-, 3- and 4-element noun phrases are summarized in Tables 2, 3 and 4.

Table 2. *Post-hoc comparison under the condition of 2-element noun phrase*

Age group	1	2	3	4	5	6	7	8
1		N.S.	.044088	.000035	.000028	.000028	.000028	.000028
2			N.S.	.007618	.000030	.000028	.000028	.000028
3				N.S.	N.S.	.003186	.000186	.001284
4					N.S.	N.S.	N.S.	N.S.
5						N.S.	N.S.	N.S.
6							N.S.	N.S.
7								N.S.
8								

In comprehension of 2-element noun phrases, there was no statistically significant difference among the groups after the age of 3;7. Non-significant differences were found between adjacent groups among the three youngest age groups but significant differences were found between the groups which were one or more years apart.

Table 3. *Post-hoc comparison under the condition of 3-element noun phrase*

Age group	1	2	3	4	5	6	7	8
1		N.S.	.006322	.000028	.000028	.000028	.000028	.000028
2			N.S.	.000242	.000028	.000028	.000028	.000028
3				N.S.	.000163	.000029	.000028	.000028
4					N.S.	N.S.	.030665	N.S.
5						N.S.	N.S.	N.S.
6							N.S.	N.S.
7								N.S.
8								

Table 4. *Post-hoc comparison under the condition of 4-element noun phrase*

Age group	1	2	3	4	5	6	7	8
1		N.S.	.026031	.000029	.000028	.000028	.000028	.000028
2			N.S.	.001615	.000028	.000028	.000028	.000028
3				N.S.	.000162	.000028	.000028	.000028
4					N.S.	.009155	.000093	.003562
5						N.S.	N.S.	N.S.
6							N.S.	N.S.
7								N.S.
8								

In the 3- and 4-element noun phrases, there were no statistically significant differences among the groups after the age of four (see Table 3 and 4). Before the age of four, non-significant differences were found between adjacent age groups, but statistically significant differences were found between the groups which were one or more year apart.

When all the age groups were considered, significant difference was found between 1-element noun phrase and 2-, 3- and 4-element noun phrases. Within each age group, no significant differences were found between 2-, 3- and 4-element noun phrases from the age of 4;1 to 6;0. However, Tukey's HSD procedure showed significant differences between 2- and 4-element noun phrases in the age groups of 2, 3 and 4. Moreover, subjects in the age group 1 obtained significant difference between 2-element noun phrase and 3- and 4-element noun phrases but not between the 3- and 4-element noun phrases.

Effect of Number of Concept

The mean percentage scores in different number of concepts in each age group are summarized in Table 5 to show noun phrase comprehension in relation to number of concepts.

Table 5. *Mean percentage score in different number of concepts in noun phrase comprehension*

Age group		Mean percentage score in different number of concepts Mean (SD) (%)						
		2-element noun phrases		3-element noun phrases			4-element noun phrases	
		1	2	1	2	3	2	3
1	2;1-2;6	48.75 (17.99)	37.22 (21.71)	37.27 (17.67)	36.67 (13.54)	18.75 (19.66)	28.13 (13.06)	28.13 (13.37)
2	2;7-3;0	55.00 (12.80)	43.89 (16.71)	45.91 (19.00)	40.56 (17.39)	36.25 (24.97)	31.88 (11.63)	40.00 (19.28)
3	3;1-3;6	71.25 (17.20)	48.89 (15.46)	56.82 (20.19)	55.00 (20.22)	43.75 (30.21)	46.56 (16.66)	46.88 (18.08)
4	3;7-4;0	72.08 (12.47)	67.78 (13.44)	63.18 (15.18)	73.89 (11.56)	55.00 (27.63)	53.13 (13.37)	62.50 (21.46)
5	4;1-4;6	83.75 (9.55)	69..44 (15.24)	78.63 (13.28)	78.89 (16.08)	65.00 (17.01)	67.50 (13.54)	76.88 (15.85)
6	4;7-5;0	85.00 (11.02)	79.44 (13.62)	83.18 (13.28)	81.67 (12.63)	81.25 (17.91)	74.38 (12.15)	79.38 (16.86)
7	5;1-5;6	88.33 (6.28)	81.67 (11.56)	86.82 (9.08)	83.89 (9.86)	77.50 (17.95)	82.50 (13.84)	77.50 (14.96)
8	5;7-6;0	85.42 (8.50)	81.11 (8.90)	80.91 (12.48)	84.44 (9.81)	83.75 (14.68)	78.44 (11.91)	74.38 (19.23)
Overall		73.67 (18.64)	63.68 (22.28)	66.59 (23.08)	66.88 (23.30)	57.66 (30.71)	57.81 (23.69)	60.70 (25.35)

Since the number of concepts embedded in each noun phrase varied across the number of elements, it was hypothesized that the number of concepts would also affect the subjects' performance in comprehension of noun phrase. The gender effect was proved to be non-significant statistically, so an 8 (age) × 2/3 (number of concept) two-way ANOVA with repeated measure on the number of concept within each number of element was conducted to investigate the effect of number of concepts within the same number of elements on noun phrase comprehension.

For 2-element noun phrase, statistically significant main effects of age [$F(7, 152) = 45.83$, $p=0.000$] and number of concepts [$F(1, 152) = 51.89$, $p=0.000$] were found and there was also a significant interaction effect between age and number of concept, $F(7, 152) = 2.49$, $p=.0185$. Tukey's HSD procedure revealed that no significant differences were found among the groups after the age of 3;7 for both 1 and 2 concepts. Under the condition of 1 concept, significant difference was found between age group 1 and groups 3 to 8 ($p<.001$) as well as between age group 2 and groups 4 ($p=.031$) to 8 ($p<.0001$), and group 3 and group 7 ($p=.0305$). Under the condition of 2 concepts, subjects in both age groups 1 and 2 obtained significant difference with age groups 4 to 8 ($p<.0001$).

For 3-element noun phrase, significant effect of age [$F(7, 152) = 63.69$, $p=0.000$] and number of concept [$F(2, 304) = 16.62$, $p = 0.000$] were found, but not in interaction between age and number of concept ($p>.05$).

For 4-element noun phrase, statistically significant effect was found in the factor of age [$F(1, 152) = 53.72$, $p=0.000$] but not in the factor of number of concept ($p>.05$) and the interaction between age and number of concept ($p>.05$).

Under the condition of 2-element noun phrases, all the subjects obtained better results in 1 concept (overall mean = 73.67%) than 2 concepts (overall mean = 63.68%), where the effect of number of concept was statistically significant. When 3-element noun phrases were concerned, Tukey's HSD procedure showed that subjects' performance in noun phrases with 3 concepts (overall mean = 57.66%) was significantly different from those in noun phrases with 1 (overall mean = 66.59%) and 2 concepts (overall mean = 66.88%).

Though the effect of number of concepts in 4-element noun phrases was not significant, subjects' overall performance in noun phrases with 3 concepts (mean = 60.70%) was slightly better than that with 2 concepts (mean = 57.81%). This unexpected result would be further explained in terms of noun phrase's components later in discussion.

Scores of Concepts in relation to Score of Noun Phrase

The overall percentage scores obtained in noun phrase comprehension and pre-modifier check are summarized in Table 6.

Table 6. *Overall percentage score in noun phrase comprehension and pre-modifier check*

Age groups		Overall percentage score in Noun Phrase Comprehension Mean (SD) (%)	Overall percentage score in Pre-modifier Check Mean (SD) (%)
1	2;1-2;6	44.60 (9.79)	61.96 (16.09)
2	2;7-3;0	51.82 (7.75)	69.57 (11.91)
3	3;1-3;6	62.00 (9.33)	83.04 (10.37)
4	3;7-4;0	70.47 (8.01)	89.35 (10.24)
5	4;1-4;6	79.12 (6.88)	95.43 (5.23)
6	4;7-5;0	83.82 (6.50)	96.09 (3.04)
7	5;1-5;6	86.41 (5.37)	96.74 (3.61)
8	5;7-6;0	84.35 (5.33)	96.30 (3.71)

From Table 6, in pre-modifier check, subjects older than four obtained scores higher than 95%. In order to find out the relationship between comprehension of noun phrase and concepts, the total number of concepts that each subject could comprehend was calculated and compared with the total score of noun phrase comprehension. The correlation between the total number of concepts and the total score of noun phrase was evaluated by Pearson Product-Moment Correlation Coefficient r. The score obtained in pre-modifier check was found to be significantly correlated to the total score of noun phrase comprehension, $r = .8274$ with reference to p-level at 0.05 (two-tailed).

Difficulty of Concepts

In the pre-modifier check, the scores of each concept, which was over 90%, obtained by subjects in each age group were summarized in Table 7.

Table 7. *Percentage score of each concept in each age group*

Concepts	Score of each concept in age groups (%)							
	1	2	3	4	5	6	7	8
Big		95	95	100	100	100	100	100
Small			100	100	100	100	100	100
Outside			90	90	100	100	100	95
Inside			90	95	100	100	100	100
Pink		90	100	95	100	95	95	100
Grey					90	95	90	
Brown					95	95	90	100
Purple			95	100	90	100	95	95
More		100	100	100	100	100	100	100
Less				95	100	100	100	100
Long		90	90	95	100	100	100	100
Short				100	95	95	100	100
Fat				100	100	100	100	100
Thin					95	90	100	100
Two		90	95	100	100	100	100	100
Three				95	100	100	100	100
Five					100	100	100	100
In front					95	95	95	90
Behind			90	90	95	100	100	100
Next to				90	100	100	100	95
Right					95	90	100	100
Left								
Middle						100	100	95

The results of pre-modifier check revealed that subjects aged three could obtain over 90% in score of the size concept, which was similar to the finding stated in Cooke & Williams (1985). The sequence for spatial concepts with over 90% of scores was “inside” and “outside”< “in front”, “behind” and “next to” < “middle”, “right” and “left”, where this sequence was the same as in Ho (2000). Besides, subjects aged four obtained over 90% of scores in color and numeral concepts and other adjectives. The current investigation on concepts was in agreement with the finding that different concepts were acquired at different age (Opper, 1996).

In addition, the difficulty of each concept was ranked in the descending order by the total score of each concept obtained in the pre-modifier check (Table 8). This showed that there was varying difficulty in different concepts as stated in Opper (1996).

Table 8. *Ranking of concepts in pre-modifier check*

Order	Concept (Total score in %)	Order	Concept (Total score in %)
1	More (97.5)	12	Behind (88.13)
2	Big (96.88)	13	Purple (87.5)
3	Two (95)	14	Five (86.88)
4	Pink (94.38)	15	Less (84.38)
5	Small (93.75)	16	In front (83.75)
6	Long (93.13)	17	Middle (82.5)
7	Three (91.25)	18	Brown (80.63)
8	Outside (90.63)	19	Next to (79.38)
9	Inside (90)	20	Right (76.88)
10	Short (89.38)	21	Thin (75)
	Fat (89.38)	22	Grey (71.88)
		23	Left (61.88)

Discussion

The present study indicated the following findings: firstly, there was age-related difference in preschoolers' comprehension ability of noun phrase; secondly, number of elements and concepts affected comprehension of noun phrase; and lastly, number of acquired concepts was related to noun phrase comprehension.

Effect of Age on Comprehension of Noun Phrase

The present study indicated age-related difference in Cantonese preschooler's comprehension ability of noun phrase. Continuous development was noted across the age of two to four but with subtle changes from age four to six.

After the age of four, non-significant difference in performance was noted among the subjects. According to Miller & Paul (1995), children aged four have started to acquire a variety of sentence forms containing different syntactic marking and children towards the age of five also begin to use complex sentences. When complex sentences were compared to noun phrase, syntactic structure of noun phrase was much simpler than that of complex sentences which contains one or more dependent clauses and different grammatical markers (Miller & Paul, 1999). According to Cheung (1993), children aged 3;6 achieved greatest improvement in syntactic development. Moreover, after the age of four, subjects' performance across 2- to 4-element noun phrases showed non-significant differences (Table 2 to 4). It further explained that syntactic development in children after the age of four have prepared them in comprehension of noun phrase even though the difficulty of noun phrase was increased in terms of number of elements in syntax. Therefore, children after the age of four were capable of obtaining over 80% correct due to the simple syntactic structure of noun phrase in this study.

Continuous improvement was noted from the age of two to four (Figure 1). Possible explanation for this phenomenon might be due to syntactic development and the time of acquisition of attribute and spatial relationship, which would be further explained below.

Syntactic Development

Statistically significant effect of number of elements was found mainly among the age groups before the age of four (Table 2 to 4). It implied that there was also syntactic development within noun phrase structure. According to Miller & Paul (1995) and Paul (2001), syntactic development at clause level starts from understanding two-word combinations (e.g. action-object “eat cookie”) to three-term relations (e.g. agent-action-object “cat eats fish”) from the age of 1;6 to 3;6 and children at the age of 3;6 to 4 start to understand more complex syntactic structure.

In syntactic development, two-word combination was viewed as the emergence of children’s grammatical system (McShane, 1991) and a stage before the stage of grammatical morpheme development (Taylor & Taylor, 1990). Braine (as cited in Taylor & Taylor, 1990) showed that two-word combinations had different content and function including properties of objects (e.g. big ball), recurrence (e.g. more cookies), and plurality (e.g. two shoes) and so on. Moreover, Owens (1996) stated different semantic rules in two-word combination including modifier + head (e.g. attribute + entity “big doggie”). Only the function/content and semantic rules in two-word combinations were given, but not the developmental differences. This study started with simple noun to two-word combinations including attribute-entity (Owens, 1996; Paul, 2001), like noun phrase “small apple”. Present results showed gradual syntactic development at phrase level, which was similar to that at clause level, from simple noun, to two-word combination of noun phrase or even more.

From current results, significant difference was found between the age groups which were one or more years apart under the condition of 2- to 4-element noun phrases (Table 2 to 4). It revealed that children aged within a year had similar ability in comprehending the noun phrase having same number of elements. For 2-element noun phrases, significant difference was only noted between groups before the age of 3;7. Children aged 2;0-3;0 and 2;6-3;6 perform similarly in syntax at noun phrase level. For 3- and 4-element noun phrases, there was no significant difference among age groups after the age of four. So, children aged 2;0-3;0, 2;6-3;6 and 3;0-4;0 have similar ability. Therefore, current study reflected gradual syntactic development at phrase level within noun phrase structure, which was also shown in Figure 1.

Conceptual Development

Noun phrases of this study consisted of concepts and nouns. According to Cooke & Williams (1985), children's understanding of adjectives and prepositions expanded rapidly between the age of 2;6 and 4. This would enhance children's understanding of two-word relations including attribute-entity (Paul, 2001), such as a noun phrase "small apple". In the pre-modifier check, the result indicated that subjects older than four obtained scores higher than 95% (Table 6). The result was consistent with the rapid concept acquisition period as stated in Cooke & Williams (1985) and the fact that children aged four have acquired most concepts as stated in Opper (1996). This study also showed that there was correlation between the number of acquired concepts and total score of noun phrases. It further indicated that acquisition of concepts played a role in comprehension of noun phrases with concepts. Besides, the difficulty of concepts in noun phrases should also be considered as there was varying difficulty for different concepts as shown in the ranking of concepts tested in this study (Table 8).

When the number of concepts within the noun phrase was considered, its effect was significant under the condition of 2- and 3-element noun phrases (Table 5). Greater difference was noted between noun phrases with one and two concepts in 2-element noun phrases when compared to 3-element noun phrases. The possible reason was that noun phrase structure with relative clause was used in 3-element noun phrase with one concept (e.g. Trial 38. “ling1 zyu3 sai6 ping4 gwo2 ge3 go1 go1” the boy who holds small apple). Although only one concept was involved, relative clause consisted of a verb, which was not present in other noun phrases. “Verbs are perceptually more abstract than nouns” (Cooke & Williams, 1985, p.74) and so it is more difficult for children to learn verbs. Presence of verbs increased difficulty in noun phrase comprehension. Therefore, within 3-element noun phrases, performance in noun phrase with one concept (66.59%) was similar to those with two concepts (66.88%). Under the condition of 2-element noun phrases, similar syntactic structures were used for both phrases with one (adjective-noun) and two concepts (e.g. adjective-adjective-noun). Therefore, greater number of concept increased difficulty in 2-element noun phrase comprehension.

When 4-element noun phrases were considered, unexpected result was found that subjects’ overall performance in noun phrases with three concepts (60.7%) was slightly better than that with two concepts (57.81%) though there was no significant effect in the factor of number of concepts. The possible explanation was that there were two nouns in 4-element noun phrases with two concepts (e.g. Trial 63. “<u>hap8</u> ceot7 min6 ge3 daai6 <u>bo1</u>” the big <u>ball</u> which is outside the <u>box</u>). When three concepts were embedded in 4-element noun phrases, there was only one noun involved (e.g. Trial 84. “loeng5 ji1 ceung2 ge3 fyu1 sik7 <u>bat7</u>” two long grey <u>pen</u>). Therefore, it was suspected that variance of one more noun may increase difficulty in noun phrase comprehension and variance of noun should be controlled in forming stimuli.

Clinical Implication

The present study showed that there was developmental difference in noun phrase comprehension with the greatest improvement from the age of two to four. The findings also revealed that number of elements and concepts would have affected the preschooler's comprehension ability of noun phrase. In current clinical practice, number of contrastive element is often used in assessing children's comprehension ability. The results of the current study supported the use of number of contrastive elements in assessment and also treatments as it can discriminate children aged one or more year apart. Children with one or more year of language delay could be discriminated by using different number of contrastive elements.

In daily conversation, individual concepts are often combined to different nouns. Noun phrases in this study were formed by combining concepts to nouns according to Cantonese noun phrase structure stated in Matthews & Yip (1994). In clinical assessment, speech therapist should not only assess individual concepts but also test them in combination with nouns and also other concepts. This would be similar to the use of noun phrase in daily communication. The present study also pinpointed that number of concepts was shown to have significant effect on comprehension of noun phrase. It implied that number of concepts should also be considered in forming the stimuli in clinical practice especially under the condition of 2- and 3-element noun phrases/sentences as significant effect was found in the factor of number of concepts.

Comprehension of noun phrase could be developed as one of the assessment tools in child speech therapy. First, it assessed comprehension of adjective-noun phrase which is included in both standardized and non-standardized assessments, such as Reynell Developmental Language Scale (RDLS) (Reynell & Huntley, 1985) and informal procedures suggested by Miller & Paul (1995). The results of present study provided framework for normative data of noun phrase comprehension and noun phrases with different number of contrastive elements could discriminate children aged with one or more year apart. Second, concepts could be assessed systematically in combination with nouns and other concepts in this study. In present clinical practice, concepts are assessed individually and in random combination made up by the clinicians in informal assessments. In formal language tests like RDLS (Reynell & Huntley, 1985), only a few concepts are assessed. Therefore, data collected in this study could be regarded as a protocol basis for developing an assessment tool for testing comprehension ability of noun phrase in Cantonese-speaking preschool children.

Direction for Further Analysis

The scale of the present study is still small. It will be valuable to expand the sample size for more comprehensive normative data as comprehension of noun phrase could be further developed as an assessment tool.

Besides, noun phrases of this study were also varied in different number of syllables. As the number of concepts in the noun phrase varied from one to three in this study, noun phrases with more concepts became longer especially those involving the locative concept.

For example, in trial 33, “ho2 siu2 tyn2 ge3 fu3” (a few short trousers) and in trial 37, “mui4 mui4 zoi2 min6 ge3 m5 go3 ping4 gwo2” (apples on the girl’s left hand side), both trials were 2-element noun phrases involving two concepts. However, trial 33 and 37 consisted of five and nine syllables respectively as a spatial concept was included in trial 37. Therefore, even with the same number of contrastive elements and concepts, noun phrases could be of different length. It was plausible that the number of syllables may also affect young children in noun phrase comprehension as there was marked constraint on the memory of young children according to Foster, Giddan & Stark (1983). Further analysis on the present data can be done in terms of number of syllables.

Conclusion

The present study aimed at exploring the ability of Cantonese-speaking preschool children in noun phrase comprehension. First, it has provided strong support that comprehension ability of noun phrase is age-related and continuous development was noted before the age of four. Second, the results also supported the current clinical practice that number of contrastive elements in phrases/sentences was able to discriminate children with language delay of more than one year. At last, the present study also pinpointed that number of concepts would affect preschooler's ability in noun phrase comprehension.

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Reference

Berk, L.E. (1991). *Child development.* (2nd Ed.) New York: Allyn & Bacon.

Bloom, L., Merkin, S. & Wotten, J. (1982). Wh-Questions: Linguistic factors that contribute to the sequence of acquisition. *Child Development, 53,* 1084-1092.

Cheung, M.P.P. (1993). *Comprehension of grammatical structures in Cantonese-speaking preschoolers: A Cantonese adaptation of the Test For Reception Of Grammar*. Unpublished B.Sc (Speech and Hearing Sciences) thesis: University of Hong Kong.

Chin, M.M.W. (1996). *Comprehension of locatives in Cantonese children.* Unpublished B.Sc (Speech and Hearing Sciences) thesis: University of Hong Kong.

Cooke, J. & Williams, D. (1985). *Working with children's language: Intervention strategies for therapy.* Tucson, Arizon: Communication Skill Builders.

Foster, R., Giddan, J.J. & Stark, J. (1983). *Assessment of children's language Comprehension manual.* California: Consulting Psychologists Press, Inc.

Ho, W.L. (2000). *Cantonese-speaking children's production of spatial terms.* Unpublished Ph.D. thesis: University of Hong Kong.

James, S.L. (1990). *Normal language acquisition.* Boston: A College-Hill Publication.

Johnson, E.G. (1977). The development of color knowledge in preschool children. *Child Development, 48,* 308-311.

Lee, K.Y.S., Lee, L.W.T. & Cheung, P.S.P. (1996). *Cantonese receptive vocabulary test.* Hong Kong: Child Assessment Service.

Matthews, S. & Yip, V. (1994). *Cantonese: A comprehensive grammar.* London : Routledge

McShane, J. (1991). *Cognitive development: An information processing approach.* Cambridge: Blackwell.

Miller, J.F. & Paul, R. (1995). *The clinical assessment of language comprehension.* Baltimore: Brookes.

Opper, S. (1996) *Hong Kong's young children: Their early development and learning.* Hong Kong: Hong Kong University Press.

Owens, R.E. (1996). *Language development: An introduction.* (4th Ed.) Boston: Allyn & Bacon.

Paul, R. (2001). *Language disorders from infancy through adolescence: Assessment and intervention.* St. Louis: Mosby, Inc.

Quirk, R., Greenbaum, S., Leech, G. & Svartvik, J. (1985). *A comprehensive grammar of the English language.* New York: Longman Inc.

Reynell, J. & Huntley, M. (1985). *Reynell developmental language scales.* Windsor: NFER-NELSON.

Soja, N.N. (1994). Young children's concept of color and its relation to the acquisition of color words. *Child Development, 65*, 918-937.

Taylor, I. & Taylor, M.M. (1990). *Psycholinguistics: Learning and using language.* N.J.: Prentice-Hall, INC.

Tyack, D. & Ingram, D. (1977). Children's production and comprehension of questions. *Journal of Child Language*, *4*, 211-224.

Wanska, S. (1984). The relationship of spatial concept development to the acquisition of locative understanding. *The Journal of Genetic Psychology*, 145, 11-21.

Appendix A

Test items

According to Opper (1996), different concepts are acquired at different ages. The followings were selected to be tested in this study. Different combinations were formed by combining the concept from a group to the other 3 groups and also combing concepts within the group, for example, 22, 23, 24 and 25. Noun phrases are arranged in the order of increasing elements. Individual concepts were tested in pre-modifier check.

Age 2 – 出入，大小	Age 3 – 多少，肥瘦，長短
Age 4 – 啡灰紫粉紅，二三五，前後隔離	Age 5 – 左右中間

Element	CON	Trial	1	2	3	4	5
1		1	1鉛筆	**2波**	3褲	4櫃	
1		2	**1杯**	2糖	3衫	4碗	
1		3	1衫	2蘋果	**3叉**	4杯	
1		4	1波	**2碗**	3杯	4褲	
1		5	1間尺	2鞋	3橙	**4蘋果**	
1		6	**1褲**	2蘋果	3樹	4衫	
1		7	1鞋	2鉛筆	**3衫**	4狗	
1		8	1杯	2書	3衫	**4鉛筆**	
1		9	1書	**2盒**	3衫	4叉	
1		10	1褲	2鉛筆	**3間尺**	4波	
1		11	1櫃	2衫	3鞋	**4椅**	
1		12	1叉	**2屋**	3杯	4褲	
1		13	1香蕉	**2狗**	3貓	4屋	
1		14	**1貓**	2老鼠	3波	4鉛筆	
1		15	1盒	2哥哥	**3妹妹**	4褲	
1		16	1蘋果	2妹妹	3書	**4哥哥**	
2	2	17	**1細既蘋果**	2細既香蕉	3大既蘋果	4大既香蕉	
2	2	18	1盒入面既狗	**2盒出面既狗**	3盒出面既老鼠	4盒入面既老鼠	
2	3	19	1好多筆	2好多蘋果	3好少蘋果	**4好少筆**	

2	3	20	**1短既間尺**	2 長既間尺	3短既裙	4長既裙	
2	3	21	1好瘦既哥哥	2好肥既妹妹	**3好瘦既妹妹**	4好肥既哥哥	
2	4	22	**1兩個蘋果**	2兩個波	3一個波	4一個蘋果	
2	4	23	1灰色既衫	2紫色既杯	**3紫色既衫**	4灰色既杯	
2	4	24	1椅隔離既妹妹	2椅後面既妹妹	3椅隔離既哥哥	**4椅後面既哥哥**	
2	4	25	1屋前面既妹妹	**2屋隔離既哥哥**	3屋隔離既妹妹	4屋前面既哥哥	
2	5	26	**1企喺妹妹中間既哥哥**	2企喺妹妹中間既狗	3企喺妹妹右面既哥哥	4企喺妹妹右面既狗	
2	5	27	1企喺妹妹左面既哥哥	2企喺妹妹右面既狗	**3企喺妹妹右面既哥哥**	4企喺妹妹左面既狗	
2	5	28	1企喺哥哥左面既狗	**2企喺哥哥左面既妹妹**	3企喺哥哥右面既妹妹	4企喺哥哥右面既狗	
2	22	29	1盒入面既細波	2盒入面既大波	3盒出面既細波	**4盒出面既大波**	
2	23	30	1盒入面既長鉛筆	**2盒出面既長鉛筆**	3盒入面既短鉛筆	4盒入面既短鉛筆	
2	24	31	1盒入面既紫色叉	2盒出面既啡色叉	**3盒出面既紫色叉**	4盒入面既啡色叉	
2	25	32	1哥哥中間既細波	**2哥哥中間既大波**	3哥哥左面既大波	4哥哥左面既細波	
2	33	33	1好多短既褲	2好少長既褲	**3好少短既褲**	4好多長既褲	
2	34	34	**1椅後面好瘦既哥哥**	2椅前面好瘦既哥哥	3椅後面好肥既哥哥	4椅前面好肥既哥哥	
2	35	35	1妹妹左面既短鉛筆	2妹妹左面既長鉛筆	3妹妹右面既長鉛筆	**4妹妹右面既短鉛筆**	
2	44	36	1屋前面既一隻貓	2屋前面既兩隻貓	**3屋隔離既兩隻貓**	4屋隔離既一隻貓	
2	45	37	1妹妹右面既三個蘋果	2妹妹左面既三個蘋果	3妹妹右面既五個蘋果	**4妹妹左面既五個蘋果**	
3	2	38	1拎住大蘋果既哥哥	**2拎住細蘋果既哥哥**	3拎住細波既哥哥	4拎住細蘋果既妹妹	
3	2	39	1盒入面既狗	2盒出面既貓	**3盒出面既狗**	4杯出面既狗	
3	3	40	1載住好少間尺既盒	**2載住好少筆既盒**	3載住好多筆既盒	4載住好少筆既杯	

3	3	41	1拎住長間尺既哥哥	2拎住短鉛筆既哥哥	3拎住短間尺既妹妹	**4拎住短間尺既哥哥**	
3	4	42	1拎住兩個橙既哥哥	2拎住一個蘋果既哥哥	**3拎住兩個蘋果既哥哥**	4拎住兩個蘋果既妹妹	
3	4	43	**1著住紫色衫既妹妹**	2著住灰色衫既妹妹	3著住紫色褲既妹妹	4著住紫色衫既哥哥	
3	4	44	1椅後面既妹妹	2椅前面既哥哥	**3椅後面既哥哥**	4屋後面既哥哥	
3	4	45	**1屋隔離既哥哥**	2屋隔離既妹妹	3屋前面既哥哥	4椅隔離既哥哥	
3	5	46	1企喺波隔離既哥哥	**2企喺波中間既哥哥**	3企喺椅中間既哥哥	4企喺波中間既妹妹	
3	5	47	1企喺妹妹左面既哥哥	2企喺狗右面既哥哥	3企喺妹妹右面既狗	**4企喺妹妹右面既哥哥**	
3	5	48	**1企喺哥哥左面既妹妹**	2企喺狗左面既妹妹	3企喺哥哥右面既妹妹	4企喺哥哥左面既狗	
3	22	49	1盒入面既大波	2盒出面既大蘋果	**3盒出面既大波**	4盒出面既細波	
3	23	50	**1盒出面既長鉛筆**	2盒入面既長鉛筆	3盒出面既短鉛筆	4盒出面既長間尺	
3	24	51	1盒出面既紫色羹	2盒出面既灰色叉	3盒入面既紫色叉	**4盒出面既紫色叉**	
3	25	52	1哥哥中間既細波	**2哥哥中間既大波**	3哥哥左面既大波	4哥哥中間既大蘋果	
3	33	53	1好少短既間尺	2好多短既褲	**3好少短既褲**	4好少長既褲	
3	34	54	1椅後面好瘦既妹妹	**2椅後面好瘦既哥哥**	3椅前面好瘦既哥哥	4椅後面好肥既哥哥	
3	35	55	1妹妹右面既長鉛筆	2妹妹右面既短褲	3妹妹左面既短鉛筆	**4妹妹右面既短鉛筆**	
3	44	56	**1屋隔離既兩隻貓**	2屋前面既兩隻貓	3屋隔離既兩隻狗	4屋隔離既一隻貓	
3	45	57	1妹妹右面既五個蘋果	2妹妹左面既五個波	**3妹妹左面既五個蘋果**	4妹妹左面既三個蘋果	

3	234	58	1好少細既紫色杯	2好少大既啡色杯	3好多大既紫色杯	**4好少大既紫色杯**	
3	244	59	**1五個細既灰色波**	2五個大既灰色波	3三個細既灰色波	4五個細既粉紅色波	
3	334	60	1好少短既啡色褲	**2好少短既紫色褲**	3好少長既紫色褲	4好多短既紫色褲	
3	344	61	1兩枝短既灰色筆	2兩枝長既粉紅色筆	3一枝長既灰色筆	**4兩枝長既灰色筆**	
3	22	62	1盒入面既細蘋果	2屋入面既大蘋果	**3屋入面既細蘋果**	4屋入面既細杯	5屋出面既細蘋果
4	22	63	1盒出面既大蘋果	2杯出面既大波	3盒入面既大波	4 盒出面既細波	**5盒出面既大波**
4	23	64	**1盒出面既長鉛筆**	2盒出面既短鉛筆	3盒入面既長鉛筆	4屋出面既長鉛筆	5盒出面既長間尺
4	23	65	1盒入面既短間尺	2屋入面既長間尺	3 屋入面既短鉛筆	**4屋入面既短間尺**	5屋出面既短間尺
4	24	66	1杯出面既紫色叉	2盒出面既灰色叉	3盒出面既紫色羹	**4盒出面既紫色叉**	5盒入面既紫色叉
4	24	67	1屋入面既啡色狗	2屋出面既灰色狗	3屋入面既灰色貓	4盒入面既灰色狗	**5屋入面既灰色狗**
4	25	68	1哥哥中間既大蘋果	**2哥哥中間既大波**	3哥哥中間既細波	4妹妹中間既大波	5哥哥左面既大波
4	25	69	1哥哥左面既細蘋果	2妹妹左面既大蘋果	3妹妹右面既細蘋果	**4妹妹左面既細蘋果**	5妹妹左面既細波
4	34	70	**1椅後面好瘦既哥哥**	2屋後面好瘦既哥哥	3椅後面好瘦既妹妹	4椅後面好肥既哥哥	5椅前面好瘦既哥哥
4	34	71	1椅隔離好肥既哥哥	**2屋隔離好肥既哥哥**	3屋前面好肥既哥哥	4屋隔離好肥既妹妹	5屋隔離好瘦既哥哥
4	35	72	1妹妹右面既長鉛筆	2哥哥右面既短鉛筆	**3妹妹右面既短鉛筆**	4妹妹右面既短褲	5妹妹左面既短鉛筆
4	35	73	1哥哥左面既短間尺	2哥哥左面既長鉛筆	3妹妹左面既長間尺	**4哥哥左面既長間尺**	5哥哥右面既長間尺
4	44	74	**1屋隔離既兩隻貓**	2椅隔離既兩隻貓	3屋隔離既一隻貓	4 屋隔離既兩隻狗	5屋前面既兩隻貓
4	44	75	1椅後面既三個波	2屋前面既三個波	3椅前面既三個蘋果	4 椅前面既兩個波	**5椅前面既三個波**

4	45	76	1哥哥中間既兩隻碗	2哥哥右面既兩隻杯	**3哥哥中間既兩隻杯**	4妹妹中間既兩隻杯	5哥哥中間既一隻杯
4	45	77	**1妹妹左面既五個蘋果**	2哥哥左面既五個蘋果	3妹妹左面既三個蘋果	4妹妹左面既五個波	5妹妹右面既五個蘋果
4	234	78	1好多大既紫色杯	2好少細既紫色杯	**3好少大既紫色杯**	4好少大既紫色碗	5好少大既啡色杯
4	234	79	1好多大既啡色波	2好少細既啡色波	3好多細既啡色杯	4好多細既灰色波	**5好多細既啡色波**
4	244	80	1三隻大既粉紅色杯	**2三隻大既粉紅色碗**	3一隻大既粉紅色碗	4三隻大既啡色碗	5三隻細既粉紅色碗
4	244	81	1五個大既灰色波	2五個細既灰色杯	**3五個細既灰色波**	4 五個細既粉紅色波	5三個細既灰色波
4	334	82	1 好少短既紫色裙	2好多短既紫色褲	3好少短既啡色褲	**4好少短既紫色褲**	5好少長既紫色褲
4	334	83	1好多長既灰色褲	**2好多長既灰色筆**	3好少長既灰色筆	4 好多長既粉紅色筆	5好多短既灰色筆
4	344	84	**1兩枝長既灰色筆**	2 兩枝長既粉紅色筆	3兩枝短既灰色筆	4兩把長既灰色間尺	5一枝長既灰色筆
4	344	85	1三條長既粉紅色褲	2三條短既粉紅色裙	3三條短既啡色褲	**4三條短既粉紅色褲**	5兩條短既粉紅色褲

Appendix B

Pre-modifier Check

		Position				Position	
Trial	**Concept**	**1**	**2**	**Trial**	**Concept**	**1**	**2**
1	大		大既波	13	短		短既褲
2	右	哥哥右面既波		14	中間		哥哥中間既波
3	入面	盒入面既波		15	瘦	瘦既妹妹	
4	左		哥哥左面既波	16	三		三個蘋果
5	出面	盒出面既狗		17	隔離	哥哥隔離既波	
6	長	長既鉛筆		18	啡		啡色
7	粉紅		粉紅色	19	細		細既杯
8	兩		兩個波	20	好多	好多波	
9	灰	灰色		21	五		五個波
10	前面		哥哥前面既波	22	後面		哥哥後面既波
11	肥		肥既哥哥	23	紫		紫色
12	好少	好少蘋果		24			

Appendix C

Letter for Recruitment of Subjects

敬啟者：

本人乃香港大學教育學院言語及聽覺科學部四年級學生，現在由本部教學顧問何韋琳博士帶領本人計劃一項研究，目的為探討二至六歲兒童的語言理解能力。我們誠意邀請貴校參與是次研究，貴校的參與將會幫助我們了解兒童的語言理解能力。

此研究會評估二至六歲兒童對名詞片語（如：紅色杯）的理解能力，每位兒童需要接受一次個別測試，每次測試大概需時三十分鐘。我們需要八十名兒童（十名兒童在每一個年齡組別2;1-2;6, 2;7-3;0, 3;1-3;6, 3;7-4;0, 4;1-4;6, 4;7-5;0, 5;1-5;6, 5;7-6;0）參與此研究，及需要約五天時間進行測試，即每天約十六位兒童參與。本研究暫定於二零零四年十二月初進行，我們盼望貴校能提供兩個房間作測試之用。

我們會把整個研究的測試過程錄影，以便日後作詳細分析，所獲得的資料只會作是次研究之用，並予以保密。錄影帶上將不會顯示兒童的姓名。

我們十分感謝貴校的支持及參與。如有任何疑問，請致電60518062與李家寶同學聯絡。

敬祝教安。　　此致

聖雅各福群會麥潔蓮幼兒中心主任

香港大學言語及聽覺科學部
四年級學生李家寶　謹啟

香港大學言語及聽覺科學部
教學顧問何韋琳博士　謹啟

二零零四年十一月十六日

Appendix D

Consent Form

二至六歲香港兒童的理解能力之研究
家長同意書

本部將進行一項研究，目的為了解二至六歲兒童的語言理解能力。此項研究由本部教學顧問何韋琳博士帶領李家寶同學進行。

現誠邀閣下兒子／女兒於十二月在幼兒中心內接受一次個別測試，需時大概二十分鐘。閣下兒子／女兒只需於聽到研究員指示後，從四幅圖畫中指出適當的圖畫便可，測試過程對孩子並沒有害處。而閣下的支持，將會有助於了解兒童的語言理解能力，制訂適當的評估方法。

我們會把整個研究的測試過程錄影，以便日後作詳細分析，所獲得的資料只會作是次研究之用，並予以保密。錄影帶上將不會顯示閣下孩子的姓名。

我們十分感謝閣下的支持及參與。如有任何疑問，請致電60518062與李家寶同學聯絡。

本人 ___________________ *(家長/監護人姓名)* 同意 ______________ *(小孩姓名)* 參與是項研究。茲證實上述所有事項，研究員已向本人詳細解釋，本人亦完全明白一切有關安排。

家長/監護人簽署：

____

聯絡電話：___________________

日期：_______________________

研究員簽署：

____

日期：_______________________