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**Choosing a story for measuring language development
in Cantonese-speaking children**

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Abstract

This study aimed at determining which story, the familiar or the unusual story, could give a more representative language sample and was more developmental sensitive.

This study found out that children used more complex sentences in the unusual story than in the familiar story while the sentence length and lexical diversity were not significantly different between the two story types. This meant unusual story gave a more representative language sample. Seven years old children produced longer sentences than 5 years old children. No interaction effects on story type and age group were found in any of the measures, to show that age group difference was not consistent across story types. This indicated that neither the unusual story nor familiar story was more developmental sensitive. Therefore, results from this study did not strongly favor one story type over the other. Preliminary evidence, however, suggested that the unusual story seemed to be more useful.

To assess a child's language, a language sample is often elicited. It provides more ecologically valid information of the child's language skills than standardized tests (Paul, 2001). Standardized tests often underestimate children's expressive language ability. Children who are not familiar with the highly structured task used in standardized tests often perform poorly. Conversation and story-telling are two major methods to elicit language samples. These methods are less structured and the children are more familiar with these situations. So the language productions are more representative than that in standardized tests. Conversation is different from story-telling. It is a dialogue and the speaker is supported by the conversational partner. Story-telling is a monologue. The speaker has to orient the listeners to the story. Chapman and Miller (1980) suggested that different methods should be used for children at different age or developmental level. For example, conversation is suitable to children as young as 1 year old but storytelling is only suitable to children older than 3 years old. According to Paul (2001), narrative production can examine the ability of older children to produce connected discourse. Leadholm and Miller (1995) also suggested that narrative production is the most reflective of the developmental change in children's general language skills. Sentence length is often longer in narratives than in conversations (Nippold, 1998). Children tend to produce more complex linguistic units, such as coordination and subordination, and functional

categories, such as aspect markers, in narratives than in naturalistic conversations (Wong, Au & Stokes, 2004). To directly elicit a narrative, prompts or stimulus are usually provided (Ely, Wolf & Macabe, 2000), which may include a film, a picture or a story book. In a clinical context, most speech therapists prefer to use a wordless story book or a single picture to elicit a narrative.

The naturalness and the context of the stimulus greatly affect the quality of the narrative (Owens, 1999). Therefore, it is very important to choose the most suitable stimulus to elicit a language sample. Owens (1999) suggested that the more natural the topic and the context are, the more representative the narrative will be and a better reflection of the client's ability can be obtained. This may suggest that a highly familiar daily event should be used as stimulus. On the other hand, in Gillam and Pearson's (2004) Test of Narrative Language (TNL), both unusual and familiar events are used to elicit a narrative from the children. Familiar events are events that the children have experience with. These events usually take place in a common place and the outcome of the event is universally expected. Unusual events are events that the child has not experienced before. The environment of the event is a strange place and the outcome of the event is out of expectation. The TNL is a standardized test which was normed on a sample of 1059 English-speaking children aged between five and eleven years old. It is a valid and reliable measure of narrative language

which could successfully identify children with language problems with a sensitivity of 0.92 and a specificity of 0.87. The high sensitivity and specificity obtained suggested that using both unusual and familiar events can elicit the most representative language samples from children. Thus, the narrative of an unusual event can provide additional information to the narrative of a familiar event. From the author's clinical experience, when children produce narratives of daily events, they tend to use short, simple and stereotyped utterances. On the other hand, when they produce narratives of unusual events, children are more interested in it and their narratives are more varied.

Hedberg & Stoel-Gammon (1986) stated that children's familiarity with and interest in the story affected the quality of narratives. When children are producing a story of a familiar event, they expect that the listeners are familiar with the context of the story and the causal relationship of the events so they describe less on them. On the other hand, no one-to-one real world correspondence is found in the narrative of an unusual event (Ely, Wolf & Macabe, 2000), so children have to describe the story in a more detailed and organized way in order to make the listeners understand.

Also, children are more interested in unusual events. They tend to speak more about the event. This may suggest that an unusual event can elicit a more representative language sample. Moreover, more advanced verbal ability is needed in order to

orient the listener to the unusual setting and the relationship of events in the story of an unusual event. Older children generally have more advanced verbal abilities.

This may suggest that narratives of an unusual event can reveal a greater developmental difference.

Regardless of story types, language measures provide a vehicle to examine the children's language knowledge. Mean length of utterance (MLU) is a measure of utterance length (Brown, 1973; Nippold, 1998; Scott & Stokes, 1995). A number of studies of English-speaking children (Owens, 1999; Hirsh-Pasek, Kochanoff, Newcombe & Uillers, 2005) have reported that the increase in MLU was prominent only in the preschool years. On the other hand, Leadholm and Miller (1995) found that MLU continued to increase from 5-year-old to 7-year-old English-speaking children. Scott and Stokes (1995) also stated that there was a steady, though slow, increase of spoken sentences throughout the primary and secondary school years of English-speaking population. For Cantonese-speaking children, a previous study found that there was a significant linear relationship ($R = .44$) between MLU and age in 70 typically developing children aged from 27 to 68 months (Klee, Stokes, Wong, Fletcher and Gavin, 2004). MLU increased linearly from 27 to 68 months. In Wong (1993)'s study, which aimed at developing a quantitative analysis of Cantonese-speaking children's syntax in story retelling, 7-year-old children produced

significant longer sentence than 4-year-old children. These suggested MLU is a valid measure for older children.

There are two commonly used measures of lexical diversity. Number of different words (NDW) is one of them and it counts the number of different words produced by children in the language sample (Leadholm & Miller, 1995). Miller (1991) used NDW to measure the semantic diversity of narrative and conversation samples produced by 192 English-speaking children aged between 3 years to 12 years. He found out that NDW increased with age in both conversation and narrative samples. Another measure of lexical diversity is D. It is a computerized measure using the software, VOCD. Klee et al (2004) used D to measure lexical diversity and found that there was a significant curvilinear relationship ($R = .73$) between lexical diversity and age. D increased from 27 to 55 months but leveled off between 58 to 68 months. Klee et al (2004) chose D over NDW because D was independent of sample size. However, Owen and Leonard (2002) compared D generated from different sample sizes and found that D was dependent on the sample size. The larger sample size resulted in a significantly higher D. As both of the measures were dependent on the sample size, and D required a computerized data set, NDW was chosen for this study.

Apart from the lexical diversity and the mean length of utterance, the sentence complexity is another area that should be investigated in the language sample analysis.

However, there are very few measures for the sentence complexity of Cantonese.

Wong (1993) developed some indices to analyze syntax of narrative production in Cantonese. The Composite Index (ComI) is the average number of coordinated and/or subordinated clauses used in each utterance. This index was found to be developmentally sensitive. Seven-year-old children produced significantly more composite sentences than 4-year-old children. Zhu (1986) suggested that the composite sentence, i.e. sentence with coordinated or subordinated clauses, grows rapidly between the age 4 and 6. However, the sentence form development is at two levels. At the sentence level, a sentence is more complex when it contains more than one clause. At the clause level, it becomes more complex when it contains more within-sentence elements (Owens, 1999). ComI fails to look into the complexity of the latter. For complexity of within-sentence elements, Wong (1993) suggested that syntactic complexity was mainly contributed by predicate elaboration. Two main types of predicate elaboration, serial verb construction and pivotal construction, were developed between the age of four and seven. Serial verb construction is three times more frequent in the narratives of 7 year old than 4 year old (Wong, 1993). It is a productive construction in Cantonese (Matthews, 2000). To measure sentence complexity, a measure that can include both sentence level and clause level analysis is needed.

To analyze a language sample, measure on only one dimension is not sufficient.

Different measures can complement each other. MLU fails to tell the specific structural complexity of a child's sentence (Owens, 1999) but the measure of sentence complexity can fulfill this goal. So it is essential to apply all these measures to analyze language samples.

The aim of this study was to determine whether there was a significant difference between the two types of story, the familiar and the unusual story on measures of sentence length, sentence complexity and lexical diversity. The story type that gives a more representative language sample and is more developmentally sensitive should be the one to be considered for clinical use. A more representative language sample is the one which gives higher scores in the language measures. Such as, if the language sample of unusual story gives a higher score in the measures of sentence length, sentence complexity and lexical diversity than that of familiar story, it would be a more representative sample. A more developmentally sensitive story type is one that includes the most measures that report development differences between the age groups. For example, if there is only one measure showing age difference in the familiar story, but all three measures show age differences in the unusual story, the unusual story would be more developmentally sensitive.

To assess developmental sensitivity, different age groups should be included in

the study. Since this was the first time to examine the effect of story types on the language measures, only two age groups were included. Five-year-old and 7-year-old children participated in this study. They should be able to produce true narratives (Paul, 2001).

For each of the three measures (sentence length, lexical diversity and sentence complexity), research questions will be asked:

- 1) Is there a difference between the two story types?
- 2) Is there a difference between the two age groups?
- 3) Is the difference between the two age groups consistent across the story types?

Method

Participants

Ten 5-year-old children, aged between 5 years and 5 years 10 months, and ten 7-year-old children, aged between 7 years and 1 month and 7 years and 10 months, participated in this research. The mean age of the two age groups was 5 and a half years old and 7 and a half years old respectively. The 5-year-old children were recruited from a K3 class in a kindergarten. The 7-year-old children were recruited from a P2 class in a primary school. They were native speakers of Cantonese, with no visual or auditory impairments. Their teachers regarded them as normal learners

with moderate academic performance.

Stimuli

The author of this paper and her supervisor adapted the unusual story from a book called *The Tooth Fairy* (Hall, 1994) and created the familiar story. They also designed the drafts before the illustrations were drawn by an amateur artist. Slight modifications to the two story books were made by the same artist after a pilot study, including adding pages to make the stories more organized and to increase the unusualness of the unusual story. The final version of the story books had ten pictures. Each story had three main groups of characters and two episodes (Appendix A). This was to make sure that the only difference between the two stories was the familiarity of the stories.

The familiar story was called the *McDonald Story*. It took place in a McDonald. Two children who loved to eat McDonald food was brought to McDonald. They got a doll as a gift from a meal. However, they forgot to take the doll and the customer service representative gave the doll back to them. Then they fought for the doll in the McDonald. During the fight, they caused three secondary students to drop their food. Finally the parents apologized for them and they played the doll together after that. It was a familiar story because it was assumed that every child had been to McDonald. They had experience of buying dolls in McDonald and

been taught that they should share their toys and play together.

The unusual story was called the Tooth Fairy. It was about a child who liked to eat sweets. A tooth fairy took him to the Tooth-Kingdom and then a tooth-checking station. He saw a child who just received bad result for his tooth check and was punished by some Tooth-Robots. He was very afraid about that. Surprisingly, he got a good result in the check. The robots liked him a lot and chased after him to give him a kiss. Finally, the tooth fairy saved him and brought him back to his bedroom. He kept on eating sweets after that. It was an unusual story because the Tooth Kingdom was an imaginative place. Children should have never been chased by robots, and have been taught that eating sweet would give them bad teeth. The context was unfamiliar to the children and the outcome of event was out of expectation.

Procedure

The experimenter interviewed each child individually in a quiet room. The experimenter chatted with the child for a short while to establish rapport. She then presented a trial story (adapted from the story “My Dream” (Wildsmith, 1986)) to the child to make sure that s/he understood what was expected of him/ her. The complexity of the sentences in this story was balanced (Appendix B). This story had an equal number of simple, coordinate and subordinate sentences. It was to make

sure that the trial story would not bias the child to a certain sentence type. A wordless picture book was used to illustrate the story. The experimenter and the child went through the story book together once and then the experimenter told the story. The experimenter then remarked that child who told a good story would get two sweets. Otherwise, s/he would only get one.

The child was then asked to tell the familiar or the unusual story one after the other (Appendix A). The order of the stories presented was randomized for the children to balance the practice effect. For each story, a simple background was introduced (see Appendix C). Then the child was asked to go through the illustrations from front to back him/herself. When s/he was ready, s/he told the story which was recorded by a SHARP MD portable recorder (MD-MT770). The experimenter told the child that she could not see the story books while the child was telling the story so that the child must tell the story in detail to her. She also sat in a position that did not allow her to see the story book. When there was a long pause, the experimenter would prompt the child by saying, "Finished?" or "Any more?" The experimenter did not ask any specific information about the story not is being told or elaborate from the child.

Transcription and segmentation of language sample

The tape-recorded narratives were then transcribed orthographically by the

experimenter who collected the language samples. Direct responses to the experimenter's prompts or speech directed to the experimenter, stereotyped and self-repeated utterances, utterances that were subsequently repaired and incomplete sentences were all excluded from the language sample.

The reduced language samples were then divided into sentences based on syntactic and prosodic boundary markers and semantic completeness. For syntactic markers, it was considered as a sentence when it was syntactically well-formed. A sentence was regarded as a basic unit to express a complete meaning. It contains both subject and predicate (Greenbaum, 1990). However, subject drop is common in Cantonese. Subjectless sentence was regarded as complete sentence. Sentences with no predicate were regarded to be incomplete sentences (see example in Appendix D). A complete sentence could be a single word sentence, subjectless sentence, subject-predicate sentence or composite sentence. Examples of each sentence type were listed in Appendix D. Sentence final particles also helped in the segmentation of sentences as it marked the end of a sentence. For prosodic boundary markers, falling intonation and pauses suggested the end of a sentence. Semantic completeness also played a role in the segmentation. In the follow example, “一個機械人(short pause)見到佢冇食到糖” “A robot (short pause) saw that he hadn't eaten sweets”, it was counted as a sentence rather one incomplete sentence + a subjectless

sentence. As the subject, the robot, hadn't been mentioned before, it was clearly to be the subject of the following predicate. Without the subject, the second part would become semantically incomplete.

Scoring

Mean Length of Sentence (MLS)

As sentence complexity score investigated language sample upon sentence level, to compare between measures, MLS was calculated instead of mean length of utterance. The number of morphemes of each sentence was first counted. It followed the rules for the counting of morphemes by Brown (1973) and some rules specified for Cantonese by the author of this paper. These specific rules include sentence final particles were counted as one morpheme when they were combined, e.g. 喇嘢 (laa3bo3). Pronouns, such as 嗰度 (there), 咁樣 (this) were counted as one morpheme. Questions words were counted as one morpheme, such as 係咪 (Is it?), 好唔好 (OK or not?). The total number of morphemes was then divided by the number of sentence and this resulted in the MLS.

Number of Different Words (NDW)

NDW was based on the same number of word tokens for all children. It was because to compare within or among children, the total number of words across sample should be controlled. The total number of words differed from sample to

sample in this study so the minimum total number of words in all samples, 44, was taken. In the first 44 words of each sample, the first appeared words were counted. Words in mazes were excluded (Leadholm and Miller, 1995). The number obtained was the NDW.

Sentence Complexity Score (SCS)

A measure of sentence complexity, Sentence Complexity Score (SCS), was proposed in this study. SCS analyzed sentences in two levels, the sentence level and the clause level. Firstly, a sentence was credited if it was a composite sentence. Wong (1993) found out that the Composite Index (ComI) is an index that is developmentally sensitive. For clause level analysis, the number of verbs and predicative adjectives was counted. A Cantonese clause can have no verb but only a predicative adjective. For example, in the sentence 我好開心 “I very happy.”, 開心 was a predicative adjective. So the number of verbs and/ or predicative adjectives in a clause was counted instead of verbs only. Marks were credited to the clause if it contained more than one verb and/ or predicative adjective.

For the scoring of SCS, each sentence was credited a mark (see Appendix D for the scoring scheme). At the sentence level analysis, the sentence was first determined to be a composite or a simple sentence. The composite sentence, which was a sentence with two or more clauses connected (Greenbaum, 1990), appears

developmentally later than the simple sentence (Kwong, 1992; Wong, 1993) and so it was credited two marks. Greenbaum (1990) defined clause as a sentence or sentence-like construction in a sentence. A simple sentence which had only one clause was credited one mark. For composite sentence, it was further classified into a coordinate or a subordinate sentence. The coordinate sentence was a sentence whose clauses were independent (Greenbaum, 1990; Nippold, 1998). The subordinate sentence was a sentence with one subordinate clause (Greenbaum, 1990; Nippold, 1998). As subordinate sentence appears developmentally later than coordinate sentence (Bloom, Lahey, Wood, Lifter, Fiess, 1981), two marks were given to the subordinate sentence and one mark was given to the coordinate sentence. After the sentence level analysis, the sentence was further analyzed at the clause level. The number of verbs and/ or predicative adjectives in each clause was counted. Both pivotal construction and serial verb construction contain more than one verb or predicative adjective in the sentence. One mark was credited to clauses with more than one verb and/ or predicative adjective. The total mark of the whole sample was then divided by the number of sentences and this was the SCS.

Results

Children produced a similar number of sentences in the two story types.

Children in the 5-year-old group produced an average of 12.4 and 12.8 sentences in

their unusual and familiar stories respectively. Children in the 7-year-old group produced an average of 19.3 and 20.8 sentences in their unusual and familiar stories respectively.

Differences between age and story type were examined for each of the measures. The result of the language sample analysis was presented in the following paragraph on a measure-by-measure basis, with the order, MLS, NDWPS and SCS.

MLS

The 7-year-old children (mean = 8.99, $SD= 1.42$) produced longer sentences than the younger 5-year-old children (mean = 7.23, $SD= 1.42$). Sentences were longer in the unusual stories (mean = 8.34, $SD= 1.90$) than in the familiar stories (mean= 7.88, $SD= 1.39$). The difference in MLS was greater in the 7-year-old group than in the 5-year-old group.

A two-way ANOVA, story type (2) X age group (2), was performed on the data set to examine whether these differences were statistically significant. The main effect of age was confirmed to be significant, $F(1, 18) = 9.127, p= 0.007$. Neither the main effect of story type ($F(1, 18) = 2.93, p= 0.104$) nor the interaction effect ($F(1, 18) = 0.169, p= 0.686$) turned out to be statistically significant. Table 1.1 shows the means of the mean length of sentences produced by the children in the 5- and 7-year-old groups in the two stories

Table 1.1 Mean (standard deviation) of the mean length of sentences produced by children in the 5- & 7-year-old groups in the two stories

Age	Familiar story	Unusual Story	Overall performance (familiar + unusual stories)
5	7.05 (0.87)	7.40 (1.85)	7.23 (1.42)
7	8.71 (1.34)	9.28 (1.51)	8.99 (1.42)
Whole sample	7.88 (1.39)	8.34 (1.90)	/

NDW

The 5-year-old children (mean = 30.4, $SD= 2.76$) and the 7-year-old children (mean = 30.9, $SD= 2.43$) produced very similar number of different words. The number of words produced in the unusual stories (mean = 31.1, $SD= 2.51$) was also very similar to that produced in the familiar stories (mean= 30.2, $SD= 2.63$). The difference was very slightly greater in the 5-year-old group than in the 7-year-old group.

A two-way ANOVA, story type (2) X age group (2), was performed on the data set to examine whether these differences were statistically significant. Neither the interaction effect ($F(1, 18) = 0.462, p = 0.505$), main effect of age ($F(1, 18) = 0.243, p=0.628$) and the main effect of story types ($F(1, 18) = 0.632, p=0.437$) was significant.

Table 1.2 shows the mean number of different words produced by the children in the 5- and 7-year-old groups in the two stories.

Table 1.2 Mean number of different words (standard deviation) produced by children in the 5- & 7-year-old groups in the two stories

Age	Familiar story	Unusual Story	Overall performance (familiar + unusual stories)
5	29.8 (3.05)	31 (2.45)	30.4 (2.76)
7	30.6 (2.22)	31.2 (2.70)	30.9 (2.43)
Whole sample	30.2 (2.63)	31.1 (2.51)	/

SCS

The 7-year-old children (mean = 2.05, $SD= 0.42$) produced more complex sentences than the younger 5-year-old children (mean = 1.88, $SD= 0.36$). More complex sentences were produced in the unusual stories (mean = 2.11, $SD= 0.41$) than in the familiar stories (mean= 1.82, $SD= 0.32$). The difference was greater in the 7-year-old group than in the 5-year-old group.

A two-way ANOVA, story type (2) X age group (2), revealed that the main effect of story types was confirmed to be significant, $F(1, 18) = 1.96, p=0.004$. Neither the main effect of age ($F(1, 18) = 1.6, p= 0.222$) nor the interaction effect ($F(1, 18) = 1.44, p=0.245$) turned out to be statistically significant. Table 1.3 shows the mean sentence complexity score produced by the children in the 5- and 7-year-old groups in the two stories

Table 1.3 Mean sentence complexity score (standard deviation) obtained by children in the 5- & 7-year-old groups in the two stories

Age	Familiar story	Unusual Story	Overall performance (familiar + unusual stories)
5	1.79 (0.22)	1.97 (0.45)	1.88 (0.36)
7	1.85 (0.41)	2.25 (0.34)	2.05 (0.42)
Whole sample	1.82 (0.32)	2.11 (0.41)	/

Reliability

Intrarater reliability

Four narrative samples, one from each story type from each age group, were randomly selected to be scored again within 4 weeks by the experimenter. The agreement between the two sets of scores was computed in percentages and they were 99%, 100% and 96% accuracy for MLS, NDWPS and SCS respectively.

Interrater reliability

A total of four narrative samples, one from a story type of each age group, were randomly selected for re-transcription and rescoring by another scorer. The instructions described in appendix D were given to the scorer as guidelines of scoring. High agreement was obtained in the scoring of MLS, NDWPS and SCS with 99%, 98% and 94% accuracy respectively.

Discussion

A better story type is one that can give higher scores in language measures and show age difference in more number of measures. This story type should be chosen to elicit narrative samples. However, according to the result of this study, unusual story gave higher scores only in the SCS. Familiar story didn't give higher scores in any of the measures. Only MLS showed the age difference. However, it was not affected by the story type. Therefore, the result from this study did not strongly favor one story type over the other. Preliminary evidence, however, suggested that the unusual story seemed to be more useful.

SCS

Significantly more complex sentences were produced in the unusual story than in the familiar story. In the familiar story, the participants could safely assume that the experimenter was familiar with the context of a McDonald restaurant, less description was needed. On the other hand, an unusual event was not a event that happened every day. Therefore, the participants had to describe the event and the environment to their listeners in more detail. Moreover, the unusual story was about a child, though, loved to eat sweet but still could get a good result in the dental-checking station. It did not follow what children generally believed. This stimulated the children's thinking. They tended to say something to explain or amend this odd phenomenon and so favored the production of the subordinate sentence. Thus, this

resulted in a higher SCS.

However, no age difference was seen in the SCS in either of the story types.

According to the subjective judgment of the experimenter, 7-year-old children produced more complex sentences than the 5-year-old children. Failure to show developmental differences should be due to the relatively simple scoring scheme.

The development of the SCS was aimed at creating a simple and quick measure of sentence complexity in Cantonese for clinical use. However, it seemed that only taking composite sentences and the number of verbs and predicative adjectives into account might not be sufficient to detect age differences. Children who produced sentence at different complexity level could potentially get the same marks. For example, a 5-year-old child produced a sentence, ‘話好鐘意佢’ “said that liked him very much” and a 7-year-old child produced a sentence ‘有個侍應生就送左一隻白兔仔既玩具俾佢地’ “there was a waiter gave a white rabbit doll to them”. Both of these sentences got two marks. However, the second sentence was obviously more complex than the first sentences as it contained three verbs, aspect marker and noun phrase expansion. Also, looking into two levels of a sentence might not be enough. Greenbaum (1990) stated that determining a sentence as either coordinate or subordinate sentence was merely looking at the highest level of a sentence. Combination of coordinate and subordinate sentences can occur at the lower level.

This was observed in the language samples obtained in this study. The following sentence was one with three levels.

<p>Level 1: 以後食糖果同埋食零食個陣時，要適當時先可以食，同埋臨訓之前要刷牙。 “In the future, when you are eating sweet and eating snack, eat at the appropriate time, and brush teeth before sleeping.” -- Coordinate sentence</p>			
<p>Level 2: 以後食糖果同埋食零食個陣時，要適當時先可以食 “In the future, when you are eating sweets and eating snacks, eat at the appropriate time” – subordinate sentence</p>		<p>同埋臨訓之前要刷牙 “and you should brush teeth before sleeping.” – subordinate sentence</p>	
<p>Level 3: 以後食糖果同埋食零食個陣時 “When you are eating sweets and eating snacks” -- Coordinate sentence</p>	<p>要適當時先可以食 “eat at the appropriate time” - Subordinate sentence</p>	<p>同埋臨訓之前 “Before sleep” – simple sentence</p>	<p>要刷牙 “should brush teeth” – simple sentence</p>

Moreover, there was a lot of uncertainty in judging the grammar of Cantonese.

For example, the omission of subjects and connectives in the composite sentence made the judgment of composite sentences difficult. Example 1 below can be considered as one composite sentence or two separate sentences. If the second part was considered as the reason of the first part, it should be counted as a subordinate

sentence. However, these two parts could also stand alone independently.

Example 1 唔可以各不相讓 避免影響到第二個

Also, a word can be or not be a verb under different contexts. In example 2, 係度 is as an aspectual marker, indicating that the action is continuous. But in example 3, 係度 refers to physical existence. Only the 係度 in example 3 was counted as a verb.

Example 2 我係度食緊飯 I am having meal.

Example 3 我係度 I am here.

These uncertainties posed a negative effect on the validity and reliability of the SCS. A composite sentence may be regarded by some as a simple sentence due to the omission of connectives, leading to discrepant scorings between judges. Though SCS failed to be developmentally sensitive, a measure of sentence complexity was still needed. Such a measure should build on a more systematic and clearer definition of grammar of Cantonese. Grammatical aspects that were developmentally sensitive had to be found out. Then a valid, reliable and hierarchical analysis system of sentence complexity can be developed.

MLS

A significant difference was seen between 5-year-old and 7-year-old children only in the measure of sentence length. This was consistent with Scott and Stokes

(1995), Leadholm and Miller (1995) and Wong (1993)'s finding. Owens (1999) and Hirsh-Pasek, et al (2005) stated that MLU becomes useless after preschool years because it is dependent on the situation rather than the child's production ability. However, Leadholm and Miller (1995) found that developmental differences were more prominent in narration than conversation. This suggested that when the situation was controlled, especially in a narrative situation, the mean length of sentences or utterances still is a useful measure on the development of language production.

NDW

The story type and the age did not pose any effect on NDW. This might suggest that children did not produce significantly more different words in either of the stories and NDW was not a developmentally sensitive for children older than 5 years old.

However, cautions should be taken in interpreting NDW. NDW required a common total number of words for all samples as it was dependent on the sample size.

However, the total number of words of all samples in this study ranged from 44 to 272.

Due to the small sample size, the sample with the lowest total number of words cannot be excluded. Only taking the first 44 words of a sample might fail to provide a valid picture of the language skills at least in some children.

Clinical implication

This study was designed with a clinical purpose in mind. It aimed to find out a

story type that could elicit the most valid picture of a child's language production ability. According to the result of this research, children could produce significantly more complex sentences in the unusual story. This preliminary evidence suggested that an unusual story was a better stimulus to elicit a representative language sample.

In choosing a developmental sensitive measure, according to the result of this research, the MLS obtained from narratives was developmentally sensitive for Cantonese-speaking children between 5 and 7 years of age. According to this research, 5-year-old children produced sentences with a mean of 7.88 morphemes and 7-year-old children produced sentences with a mean of 8.34 morphemes.

Future research

The aim of this study was to find out whether there was an effect of story type on the language measures. This study used the McDonald story and the Tooth-fairy story to represent the familiar story and the unusual story. To prove that finding from this study extend beyond these two particular stories, replication with another unusual and familiar stories should be tried. If the same result is obtained, this will suggest that the result of this study can generalize to any unusual and familiar stories.

For language measures, the result of this study indicated that the mean length of sentences was a developmentally sensitive measure in the context of narrative for 5-year-old and 7-year-old Cantonese-speaking children. However, in order to use it

as a developmental measure, a norm should be obtained from narrative samples from children of different ages.

Apart from the mean length of sentences, a measure of sentence complexity in Cantonese which can be used simply and quickly in the clinical setting is needed. Within sentence elements, such as noun phrase and verb phrase expansion, that are crucial to tap the developmental difference in sentence complexity of Cantonese-speaking children have to be found out so that a scoring scheme based on these elements can be developed.

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Appendix A

Familiar story

Story grammar	Episode I	Episode II
Setting	There were a brother and a sister. They liked to eat McDonald very much. Their parents brought them to a McDonald.	
Initiating event	They bought a doll but they forgot to take it.	There fought for the doll and so made 3 senior students drop their food.
Internal response		They were afraid.
Attempt		They apologized with their parents.
Consequence	The customer service representative gave them back the doll.	The students forgave them and leave.
Reaction	They were happy.	They play the doll together. Their parents praised them.

Unusual story

Story grammar	Episode I	Episode II
Setting	The child was called Siu2Hong1 and he liked to eat sweets very much. He lost a tooth and put it under his pillow. When he was sleeping, a tooth fairy brought him to the Tooth-kingdom.	
Initiating event	Siu2Hong1 was brought to a tooth-checking station by the tooth-fairy. He saw a child being punished due to his poor result of the tooth-checking.	The robots liked the child very much because he got good teeth. They chased him for a kiss.
Internal response	The child was very afraid.	He was afraid.
Attempt		He wanted to escape.
Consequence	The child got good result.	He was saved by the tooth fairy.
Reaction	He was surprised.	He kept on eating sweets.

Appendix B

Trial story - "My Dream" - Sentence type	code	quantity
Simple sentence with one verb and/ or predicative adjective	(1)	3
Simple sentence with more than one verb and/ or predicative adjective	(2)	3
coordinated with one verb and/ or predicative adjective in each clause	(3)	3
coordinated with more than one verb and/ or predicative adjective in only one clause	(4)	3
coordinated with more than one verb and/ or predicative adjective in 2 clauses	(5)	3
subordinated with one verb and/ or predicative adjective in each clause	(6)	3
subordinated with more than one verb and/ or predicative adjective in only one clause	(7)	3
subordinated with more than one verb and/ or predicative adjective in two clauses	(8)	3

1. 呢個小朋友叫做琪琪。(1)

"This child is called /kei4kei2/."

2. 一晚佢好早就訓覺喇 (1)

"One night, she slept very early."

3. 媽媽幫佢 kum2 好被，跟住講晚安 (4)

"Her mother helped her to cover the quilt, then said goodnight to her."

4. 訓緊覺既時候，琪琪夢見自己飛上天 (7)

"When she was sleeping, she dreamed that she had flown to the sky."

5. 佢坐住係粒星上面同埋好大力攞住粒星 (3)

"She is sitting on the star and holding it tightly."

6. 佢一邊攞實粒星星坐，一邊睇下周圍既風景(4)

"She was holding the star and admiring the view."

7. 之後佢坐係隻藍色既雀仔上面向下飛(2)

“Then she sat on a blue bird and flew downward.”

8. 佢飛到一間糖果屋到 (1)

“She flew to a candy house.”

9. 間屋個煙通係由朱古力整成同埋個屋頂係由棉花糖做既 (5)

“The chimney of the house was made up of chocolate and the roof was made up of candyfloss.”

10. 琪琪見周圍都冇人，同埋 d 朱古力實在太吸引喇 (4)

“There was nobody nearby and the chocolate was so attractive.”

11. 佢一路食個朱古力煙通，一路好開心咁笑 (3)

“She ate the chocolate chimney and smiled happily.”

12. 琪琪食飽咗之後，就行入森林裡面 (6)

“After she had eaten fully, she walked into the forest.”

13. 當佢係森林行行下既時候，突然有隻老虎衝出尼追琪琪 (8)

“When she was walking in the forest, a tiger rushed out and chased her.”

14. 老虎係咁追，琪琪係咁跑 (3)

“The tiger kept on chasing and she kept on running.”

15. 老虎不單止冇減慢，仲越跑越快添 (5)

“The tiger hadn’t decelerated and even ran faster.”

16. 因為比隻老虎嚇親，所以琪琪不知不覺就跑到條橋到 (7)

“As being scared by the tiger, she ran to a bridge unconsciously.”

17. 之後佢爬上棵樹到，但隻老虎都係咁跟住佢 (6)

“Then she climbed up a tree, but the tiger still kept on following her.”

18. 突然，琪琪回自己講唔使驚 (2)

“Suddenly, she told herself that she should not be afraid.”

19. 佢追番隻老虎落棵樹，佢追番隻老虎過條橋 (5)

“She chased the tiger down the tree; she chased the tiger across the bridge.”

20. 見到琪琪追番佢轉頭，隻老虎喊住咁想逃走 (8)

“As the tiger was chased back by /kei4kei2/, it cried and ran away.”

21. 趕走左隻老虎，琪琪好開心咁爬番上間朱古力屋上面 (7)

“After /kei4kei2/ had scared the tiger away, she climbed up the candy house happily.”

22. 佢騎住隻好大隻藍色雀仔飛番上天 (2)

“She sat on the blue bird and flew back to the sky.”

23. 飛上月亮之後，佢向下飛番屋企 (6)

“After she had arrived the moon, she flew downward to her home.”

24. 第二朝，媽媽叫琪琪起身既時候，琪琪覺得自己發左一個好開心既夢 (8)

“Next morning, when her mother awoke her, /kei4kei2/ thought that she had made a very happy dream.”

Appendix C

Rundown of the data collection

After building rapport with the child, the experimenter said:

今日呢想小朋友你幫我講個故仔啫! "I want you to help me to tell a story today!"

姐姐會比本故仔書你睇左先, 你諗下點樣講比姐姐聽啫! "I will show you a story book first. You make a story to tell me."

你睇完準備好就可以講比我聽喇! "After reading it, you can start when you are ready."

噏! 呢度有本故仔書, 係講一個小朋友叫琪琪, 佢有一晚發左一個夢啫!

你睇埋落去諗下點樣講。"This is a story book. It is talking about a child who was called /kei4kei2/. She made a dream one night. You read how the story continues."

今次第一次, 不如就姐姐講一次先啦。"This is the first time, I tell you once first."

唔, 姐姐講完喇! 跟住就到你喇啫! "I have finished telling it. This is your turn now."

我帶左 d 朱古力同糖尼。如果你講得好好聽既話, 你可以有兩粒。如果唔好聽既話, 就只得一粒。俾心機喇! "I have brought some chocolates and candies. If you tell a good story, you will get two. If you tell a bad story, you will only get one.

Try your best."

Familiar story – McDonald

呢本係講有一個哥哥同埋妹妹，佢地好鐘意食麥當勞既。有一日，佢地同爸爸媽媽講話要去麥當勞啲！咁你睇埋落去，準備好就話比我知開始喇 BO..

“This is a story talking about a brother and a sister who loved to eat McDonald food.

One day, they asked their parents to take them to a McDonald. You read it once, and tell me to start when you are ready.”

Unusual story – Tooth Fairy

呢本係講有一個小朋友叫做小明，佢好鐘意食糖既。有一晚，佢甩左隻牙啲！咁你睇埋落去，準備好就話比我知開始喇 BO..

“This is a story talking about a child, /siu1ming4/ who loved to eat sweet. One day,

he lost a tooth. You read it once, and tell me to start when you are ready.”

Appendix D

Segmentation of language sample into sentences

Ai. Syntactic indicators: it was considered as a sentence when it was syntactically well-formed. It could be:

- Single word sentence, e.g. 好呀! "Yes!"
- Subjectless sentences, e.g. 甩左隻牙。"lost a tooth."
- Subject- predicate sentence, e.g. 天使帶佢走。"The fairy took him away."
- Composite sentence, e.g. 佢地臨走之前, 姐姐就送左一個玩具比佢地。"Before they went away, the elder girl had given a toy to them."
- Incomplete sentences were those without predicate. They were excluded.

E.g. d 牙 白色既牙齒 "Those tooth, the white tooth."

Aii Sentence final particles helped in segmentation too as it marked the end of a sentence.

B. Prosodic Indicators: falling intonation and pauses suggested the end of sentence

C. Semantic Indicators: semantic completeness

E.g. 一個機械人(short pause)見到佢冇食到糖。"One robot (short pause) saw that he hadn't eaten sweet." It was counted as a sentence rather one incomplete sentence + a subjectless sentence.

MLS - Counting the number of morphemes

Rules adapted from Brown (1973)

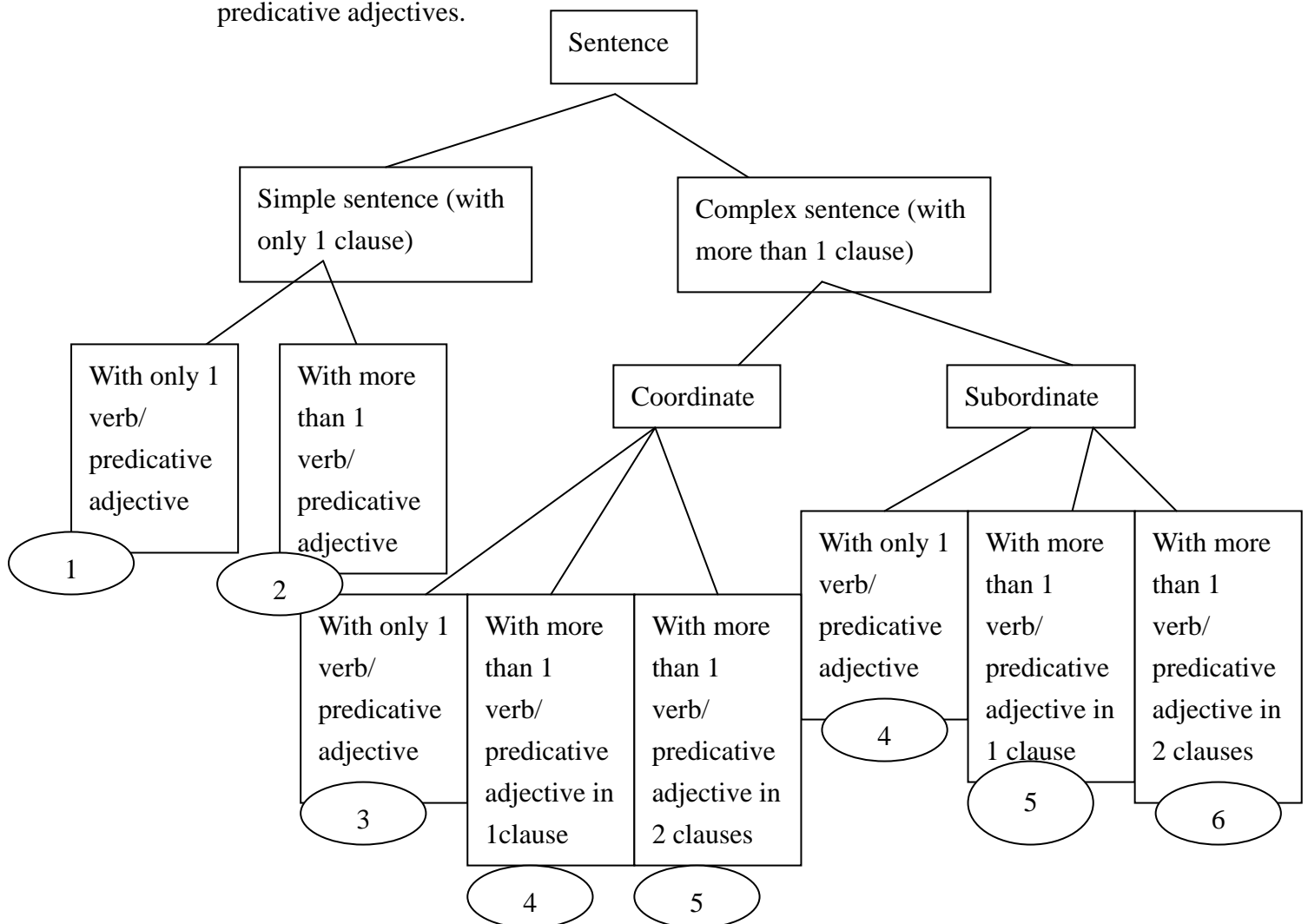
1. Words in mazes are excluded. Mazes includes false starts, repetitions and reformulations.
2. Words for emphasis, or the like, count each occurrence. e.g. 佢係度篤. 篤. 篤.
篤. 篤. 篤
3. Fillers are excluded. No, yeah, hi are counted. e.g. 哎呀
4. Combined nouns were counted as one morpheme, e.g. 牙齒王國, 麥當勞姐姐.
5. Diminutives and auxiliaries are counted as one morpheme, e.g. 牙仔

Rules set in this study

1. Sentence final particles are counted as one morpheme when they were combination, e.g. 喇嚟, 架嘞, etc
2. Pronouns were counted as one morpheme, e.g. 嗰度, 咁樣, etc.
3. Question words were counted as one morpheme, e.g. 係咪, 好唔好, etc.

Sentence Complexity Score (SCS) – Scoring Scheme

1. Decide the number of clauses of each sentence. If it is a composite sentence which has more than one clause, two marks would be credited. If it is a simple sentence which has one clause, one mark would be given.
2. For composite sentence, one mark would be credited to coordinate sentence and two marks would be credited to subordinate sentence.
3. After that, the number of verbs and/ or predicative adjectives in each clause would be counted. One mark would be given to clauses with more than one verbs and/ or predicative adjectives.



Examples:

(Verbs or predicative adjectives were underlined. Dropped subjects were in brackets.)

1. 果三個 “Those three”– zero mark

Reason: it is an incomplete sentence with only the subject but no predicate.

2. 你用左隻牙 “You have lost one tooth.”– one mark

Reason: it is a sentence with one clause so it is a simple sentence. Only one verb, 用 /lose, is present.

3. 仙女就帶佢番屋企 “The fairy takes him back home.”– two marks

Reason: it is a sentence with one clause so it is a simple sentence. There are two verbs, 帶 take and 番 back.

4. 我要一個兒童餐，要個兔仔 “I want one meal for children, and want the doll.”– three marks

Reason: it is a sentence with two clauses. It is a coordinate sentence as the two clauses are independent. Each clause has one verb.

5. 跟住佢地食完 d 野，就攞左 d 野走左喇 “They have eaten the food, then (they) have taken the things and left.”– four mark

Reason: it is a sentence with two clauses. It is a coordinate sentence as there are two independent clauses. The first clause has one verb and the second clause has two verbs.

6. 大力得滯一/mun1/， 撞到隔離果三位哥哥 “Once he pulled with too much effort, (he) crashed with the three elder boys nearby.” – four marks

Reason: it is a sentence with two clauses. It is a subordinate sentence as it is expressing a temporal relationship. Each clause has one verb.

7. 小康一跌， 就跌番落佢張床度喇 “Once he fell, (he) fell down to his bed.” – five marks

Reason: it is a sentence with two clauses. It is a subordinate sentence as it is expressing a temporal relationship. The second clause has two verbs.

8. 佢就擺隻牙落去枕頭下面，唔想比爸爸媽咪同埋佢朋友知道 “He put his tooth under the pillow as he didn’t want to let his father, mother and his friends know.” – six marks

Reason: it is a sentence with two clauses. It is a subordinate sentence as it is expressing a temporal relationship. Both clauses have two verbs.

Determination of sentence types

1. Sentences other than composite sentences were all considered as simple sentences.

2. Composite sentences were further classified into coordinate or subordinate

sentences according to the following classification [cited from the notes of skills

lab of grammatical analysis of Dr. Law (2005)]

Coordinate sentence (two clauses are independent)	
并列	‘又..又..’, ‘一邊...一邊’, ‘一面...一面’, ‘一來...二來’
連貫	‘跟住’, ‘就’, ‘又’
對立	‘要...唔要’, ‘係..唔係’, ‘唔係...而係..’
選擇	‘或者’, ‘與其..不如’, ‘唔係...就係’
遞進	‘不單止...仲’, ‘不但...而且’, ‘況且’, ‘何況’, ‘再講’
分合	表示分述或綜合

Subordinate sentence (with at least one dependent clause)	
假設	‘如果’, ‘假如’
條件	‘只要..就’, ‘只有..先至’, ‘除非...否則’, ‘唔理’, ‘無論’
因果	‘因為..所以’, ‘由於..就’, ‘...因此..’, ‘既然...咁就’
轉折	‘但係’, ‘而’, ‘雖然’, ‘盡管’, ‘固然’, ‘即使’
目的	‘為咗’
連鎖	‘邊個..., 邊個就...’, ‘你話點樣做, 我哋就點樣做’
時間	‘一...就’

Determination of verbs and predicative adjectives

1. Modals were not counted as verbs, e.g. 會, 應該 etc. Modal appears before main verb and modifies it (Fletcher, Leung, Stokes & Weizman, 2000).
2. Stative verbs were counted as verbs, e.g. 啱, 驚, 緊張, 熟, 清楚, 忙, 妒忌, 羨慕.
3. Co-verbs were counted as verbs, e.g. 跟, 為, 係, 同, 到, 對, 向, 為.
4. 到 is not counted as a verb when it was acting as a verb-particle. E.g. in 仙女就帶小康尼到牙齒王國.
5. Reduplicative verbs were counted as one verb only, e.g. 食食下, 訓訓下, etc.
6. 將 was not counted as verb.
7. Directional verbs were counted as verb, e.g. 出尼, 入去, 上去, 落尼.
8. 係度 was counted as verb when it indicated physical existence but was not counted as verb when it acted as aspectual marker.

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