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<td>University of Hong Kong</td>
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Cohesion in Narratives of Cantonese-Speaking Children

with and without Mental Retardation

Lau Man Yee

A dissertation submitted in partial fulfillment of the requirements for the Bachelor of Sciences (Speech and Hearing Sciences), The University of Hong Kong, May, 4, 2001
Abstract

The study investigated the cohesive ability of mildly mentally retarded and normal children. Twenty native Cantonese-speaking normal children and twenty native Cantonese-speaking mildly mentally retarded children were selected as subjects in the study. The two groups of children were sub-divided into two language age-groups (4;06 and 6;00). Narrative cohesion was measured by i) density of conjunction, ii) proportion of various types of conjunctions, iii) types of pronominal strategy. Results revealed that the developmental trends in both conjunctions and pronominal strategy in both population groups were similar. However, retarded children performed poorer than their linguistically-matched peers. Possible explanations for the findings were discussed in terms of cognitive maturity, language proficiency, pragmatic abilities and environmental factors. Clinical impression and insights for future research in the related areas were provided.
Introduction

Narrative production is a functional skill for children in daily communication (Peterson & Dodsworth, 1991). Children experience different forms of narrative every day, such as narrating an event or telling a story. Rather than just grouping words and sentences together, narrating requires children to integrate a complex of skills from various domains of development, including linguistic, cognitive, social and pragmatic abilities (Hemphill, Picardi & Tager-Flusberg, 1991). A number of studies have also shown that narrative abilities are highly correlated with children's later social and literacy skills (Peterson & Dodsworth, 1991). As pointed out by Paul and Smith (1993), narrative has a diagnostic value as it is sensitive to higher language skills in children, especially to those who perform adequately in basic syntactic production. As a result, through studying children's narrative ability, clinicians would obtain valuable information regarding their communicative development in linguistic, psychological and cognitive aspects (Bamberg, 1987). This would, in turn, help clinicians to determine intervention direction. All these make narrative become an important area to be investigated in recent researches.

There are two common perspectives from which children's narratives can be viewed: a global level (macrostructure) or a local level (microstructure). The global level, which is the conceptual or content level of representation, represents the organizational framework of the text (Hedberg & Westby, 1993). In contrast, the local level, which is the linguistic level of representation, concerns how the text is adhered together through the use of cohesion devices (Hedberg & Westby, 1993). As examining cohesion use has been shown to be more sensitive in characterizing language difficulties in language-disordered children than measuring episode use at global level (Liles, Duffy, Merritt & Purcell, 1995), studying children's narrative ability in achieving cohesion at the local level is of paramount value.

Cohesion is important in the interpretation of the discourse since it ensures the smooth
flow of ideas in the text. It helps listeners to integrate and organize information in the discourse (Halliday & Hasan, 1976). Cohesion, according to Halliday and Hasan’s definition, referred to the continuity of semantic relations between structures in the discourse. It is created when a span of sentences is tied together to form a whole by using cohesion devices. Ripich & Terrell (1988) mentioned that inadequate or inappropriate use of these cohesion devices would make a discourse difficult to comprehend, thus resulting in ambiguities.

Halliday & Hasan (1976) categorized cohesive devices into five main types, including reference (pronominal, demonstrative, comparative), conjunction, substitution, ellipsis and lexical cohesion. As reference and conjunctions were the two most common measures studied in past researches (Peterson & Dodsworth, 1991) and would occur more frequently in children’s narratives than the other three (Liles, 1985a), this study only investigated the above two specific cohesive devices.

Conjunctions relate semantic content across propositions (Halliday & Hasan, 1976). Based on their functions, four types of conjunctions were identified, including additive, temporal, causal and adversative. Bloom, Lahey, Hood, Lifter & Fiess (1980) found that English-speaking children normally acquired the above conjunctions in the order of additive, temporal, causal and finally adversative. Tsze (1997) discovered a somewhat similar developmental sequence in Cantonese-speaking children, in which temporal and additive relations were learnt first, followed by causal relation and adversative.

Pronominal reference is another technique for accomplishing cohesion. Inadequate use of pronominal reference would result in ambiguous referent in the discourse (Shapiro & Hudon, 1991). Based on how different types of personal reference were located in the narrative, different pronominal strategies could be identified. Karmiloff-Smith’s (1980, cited in Hudson & Shapiro, 1991) earliest study revealed that English-speaking and French-speaking children aged three to five did not demonstrate any particular strategy as
they lacked the ability to consider the narrative as an overall unit. Children with ages between five and eight exhibited a better grasp of narrative cohesion by applying thematic-subject strategy where they used pronouns consistently to refer to the protagonist. Children aged eight to twelve demonstrated a more advanced cohesive linking by using full anaphoric strategy, where pronouns and nominals were used to maintain and switch reference respectively. However, Bamberg (1986) discovered that young children less than five was capable of using thematic-subject strategy whereas children with ages five to six started to apply a full anaphoric strategy in his study. In Cantonese, Tsze (1997) found that most five-year-old children applied thematic-subject strategy. Only until seven years old did children start to use full anaphoric strategy.

In the past decade, apart from investigating narrative abilities just in normal children, some researchers begun addressing this issue to the disordered population. Children with learning disabilities and specific language impairment were two main foci of their studies. (Hemphill et. al., 1995). Tuch (1977, cited in Griffith & Ripich, 1988) discovered that language-disordered adolescents produced less cohesive retelling as their normal peers did when measured by the use of pronouns and conjunctions. Feagans and Short (1984, cited in Griffith & Ripich, 1988) also found that fewer appropriate use of reference was noted in reading-disabled children’s retellings. Similar finding was demonstrated by Liles (1985b), with language-disordered children exhibited poorer cohesion device use and story comprehension.

Despite the large amount of existing literature focusing on the use of cohesive ties in other disordered population, only a small number of researches have been conducted in the Western countries to address this issue in the mental retarded population. Most of the researches carried out with mental retardation only targeted on lexical, morphological or syntactic aspects. Given the existing literature that concluded retarded children demonstrated
similar development in lexical, morphological and syntactic aspects of language as the nonretarded children, one would expect that they would perform similarly as their matched normal peers in their cohesive abilities. Nwokah (1982) was a pioneer in comparing the use of cohesive items in moderately mental retarded with normal counterparts. He investigated narrative length and the use of various conjunctions among three age groups and found that mental retarded children closely resembled the younger non-retarded groups in their use of relatively simple conjunctions. In addition, Tager-Flushberg’s (1995) study also indicated that retarded children performed similarly as the mental age matched normal in their narrative length and use of cohesive devices. However, different results were found by Kerman and Sabsay (1987). They reported that mentally retarded adults demonstrated several semantic and pragmatic deficits, especially having difficulties in using reference appropriately. In another study by Hemphill, Picardi & Tager-Flusberg (1991), the authors discovered that mentally retarded children resembled the linguistically-matched normal in terms of narrative length, use of narrative devices and number of types of connectives and tense used. However, they performed worse than their normal counterparts in their use of references. As a summary, the above studies seemed to suggest that retarded children, when matched with their normal counterparts in terms of mental age and language age, demonstrated relatively intact ability in controlling interclausal conjunctions, but exhibited difficulties in referencing.

Despite the fact that several studies concerning narratives between retarded and normal population have been conducted in Western countries, there was, to my knowledge, no relevant study on such issue conducted in Hong Kong. Generalization of these findings from Western countries to the Hong Kong society was questioned due to the language difference existed between English and Cantonese. For instance, in Hickmann & Hendriks’ (1999) study in comparing cohesion and anaphora in children’s narratives among four
languages, the authors found that the development of anaphora was determined by
language-specific properties. Different languages could affect children's rules in mapping
discourse-internal and sentence-internal functions onto the same forms.

Furthermore, as only a limited number of studies exploring narrative abilities in the
retarded children have been carried out, there were still a lot of questions remained
unanswered. For example, investigators only knew that retarded children performed
similarly as their matched peers in their conjunction use at a selected age, but whether there
was any plateau in their performance or any difference in their onset time were still a
mystery. The problem of drawing consistent conclusions was even heightened by two
methodological issues, including: (a) different populations were employed in different
studies. For instance, in Nwokah (1982)'s study, moderately retarded children were recruited;
in Kerman & Sabsay's (1987) research, mildly retarded adults were involved, while mildly
retarded children were employed in Hemphill et. al.'s (1995) study, and (b) data was
collected by using different methods. For example, narrating a wordless picture story was
used by Nwokah (1982) and Hemphill et al. (1991), while narrating report of a short film
was adopted by Kerman & Sabsay (1987). In addition, most of the previous studies
presented just a quantitative analysis of the conjunctions used. They did not judge whether
the use of that particular conjunction in the discourse was appropriate or not, thus might not
truly identify the linguistic ability of these retarded children.

Given the fact that assisting narrative development in mentally retarded children is
important and no relevant study has been addressed on this issue in Cantonese, it is worth
exploring the developmental trends of the narratives produced by retarded children. As
Hedberg (1983, cited in Hedberg & Westby, 1993) reported that children as young as two
years of age were able to construct stories by using cohesive devices and previous
researchers such as Chan (2000) did demonstrate the proportion of cohesive ties used
appeared to plateau at school-age children, it would be particularly interesting to reveal the developmental patterns in young children. Information obtained could shed some lights on the early development of the conjunction use and pronominal reference in language acquisition in these children. Thus, the purpose of the study was to investigate:

1. Any age or group difference in the density of conjunctions and proportion of various types of conjunctions produced by mildly mentally retarded and normal children.

2. Any age or group difference in the use of pronominal strategies produced by mildly retarded and normal children.

Method

Subjects

Thirty mildly mentally retarded children and thirty normal children (with ten children in each of the language age groups 3;00, 4;06, 6;00 in each population) was originally recruited in the study. Given that children with language age three years old rarely demonstrated the use of conjunctions or pronominal reference in their narratives and the ambiguities in determining their use, the two groups, normal children at language age 3;00 group (N3;00) and retarded children at language age 3;00 group (MR3;00) were excluded from the current study. Thus, a total of twenty mildly mentally retarded and twenty normal children resulted. Each group consisted of five boys and five girls.

In the mentally retarded group, children were employed from three mildly mentally handicapped schools. They were all referred by the certified speech therapists working in the special schools. They were all within the mild grade mentally retarded intelligence range. All of them were reported to have normal hearing, no Down’s syndrome, emotional or behavioral disturbances or other complicated conditions. Children with Down’s children were excluded to avoid linguistic variations among the retarded group, since Down’s syndrome children would perform linguistically poorer than the other retarded children.
(Kernan & Sabsay, 1996). No children recruited received speech therapy on discourse level within the past six months, as to ensure that the cohesion devices demonstrated by these subjects were representative of the group and was not due to the treatment effect. The Cantonese version of Reynell Developmental Language Scales (RDLS) (Reynell, 1987) was used to assess the language abilities of the children. Results of RDLS revealed that retarded children at language age 4;06 group (MR4;06) and retarded children at language age 6;00 group (MR6;00) demonstrated mean receptive language ages of 4;11 and 5;11 respectively. The mean expressive language age in the two age groups were 4;05 and 6;01 correspondingly.

For the normal group, children were randomly selected from a normal kindergarten. All of them were of normal hearing and without visual or speech and language deficits. Results of RDLS revealed that normal children in language age 4;06 group (N4;06) and normal children in language age 6;00 group (N6;00) exhibited mean receptive language ages of 4;11 and 6;00 respectively, while their mean expressive language ages were 4;07 and 6;00 correspondingly. Table 1 summarized the information of the subjects.

**Table 1  Mean of Chronological Ages and Language Ages of Retarded and Normal Children**

<table>
<thead>
<tr>
<th></th>
<th>MR4;06</th>
<th>MR6;00</th>
<th>N4;06</th>
<th>N6;00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chronological Age</td>
<td>10;00</td>
<td>10;11</td>
<td>4;07</td>
<td>6;00</td>
</tr>
<tr>
<td>Receptive Language Age</td>
<td>4;11</td>
<td>5;11</td>
<td>4;11</td>
<td>6;00</td>
</tr>
<tr>
<td>Expressive Language Age</td>
<td>4;05</td>
<td>6;01</td>
<td>4;07</td>
<td>6;00</td>
</tr>
</tbody>
</table>

**Materials**

The materials consisted of two stories, which was modified from Chan (2000). The story was modified in such a way that the target conjunctions and pronominal reference could be elicited. Two stories were used to elicit more language sample, so that the result
obtained would be more representative. The structures in the two stories were similar. As Bavin & Shopen (1985; cited in Chan, 2000) mentioned that cohesiveness of children's narratives increased with the story length, each story contained twelve colored-pictures.

**Procedure**

In this study, retelling was chosen. Reasons were: a) it was a common method for studying cohesion used by many investigators such as Strong & Shaver (1991), Liles (1985), Ng (1998) and Chan (2000), b) it could minimize the effect of memory and cognitive load on children for the purpose that the data obtained would maximally reflect children's linguistic abilities in using cohesion (Ng, 1998), c) it could give children a model so that the required structure could be elicited more easily (Ng, 1998), and d) it was clinically more appropriate than storytelling in language assessment as it could elicit longer and more elaborate samples without affecting children's organization structures in the narratives (Griffith & Ripich, 1988, Liles & Merritt, 1989). As story retelling had several advantages over storytelling and would have no direct influence on the cohesion analysis, it was considered as a suitable method used in this study.

Each subject was asked to retell two stories individually. The experimenter seated at 90° with the subject in a quiet room. Before the task began, the experimenter chatted with the subject to build up rapport first. The experimenter then presented one of the stories both pictorially and orally to the subject. The presentation of the stories was counterbalanced in which half of the subjects were assigned randomly to listen to story A first. The subject was asked to retell the story after ten minutes. The subject then listened to the second story five minutes later after the retelling of the first one. No time limit was set to retell the stories and experimenter's interruptions were kept to minimum.

**Coding and Analysis**

All production of narratives were audio-taped by SHARP MD-SR60 recorder and
transcribed orthographically. Repetitions and repairs were excluded for further analysis. Each story was segmented into clauses by applying the procedures described by Wong (1990). Modified from the methodology by Shapiro & Hudson (1991) and Tsze (1997), the following measures were taken:

**Interclausal Conjunctions.** Conjunctions that used to conjoin clauses were identified and classified into semantic-appropriate or semantic-inappropriate conjunctions first. Based on Halliday and Hasan’s (1976) definition of cohesiveness, appropriate conjunctions were those with forms matched with their meanings whereas inappropriate ones were those that caused ambiguous to readers or inferred opposite meaning to the story (Liles, 1987). Semantic criteria in categorizing a conjunction was applied as it was a method commonly used in past researches such as Liles and Tsze (1997).

Semantic-appropriate conjunctions were then further coded into four categories: additive, temporal, causal and adversative according to their functions (Halliday & Hasan’s, 1976). Additive conjunctions coordinated two independent events. Temporal conjunctions were applied to link up two or more simultaneous or sequential events. Causal conjunctions joined intentional or motivational events with cause-effect relations. Adversative conjunctions were used to connect two contrastive or constraint events. Each conjunction was marked once only. For conjunctions that expressed more than one semantic relation between the clauses, the one with more specific meaning would be identified (Peterson & McCabe, 1991, Bloom et. al, 1980), according to the rule of cumulative semantic complexity.

An error analysis was performed on the semantic-inappropriate conjunctions by primarily applying the coding system of Peterson and McCabe (1985). 'Semantic errors' referred using incorrect form to code for the meaning expressed, while 'syntactic errors' were using incorrect conjunction pairs or placing conjunctions in wrong position. According
pragmatically. Thus, two new categories: 'pragmatic use', which was identified when conjunctions served only pragmatic functions, and 'others', which was coded when the conjunctions did not fit into the three categories mentioned, were added to reveal a holistic picture of children's mastery of conjunction.

**Pronominal reference.** Nominal and pronominal forms used to switch or maintain reference were counted. Children's referential strategies in each story were determined by applying Shapiro & Hudson (1991)'s coding system: confused, nominal, thematic-subject, full-anaphoric strategies and indeterminable. A confused strategy was identified if the use of pronouns was locally determined, thus resulting in ambiguous referent. A nominal strategy was coded if only nominal forms were used to switch and maintain reference, without using pronouns. Thematic-subject strategy was classified when the subject slot for the protagonist of the story was reserved and only pronouns were used to refer to the main character, while other characters were referred by definite nominal forms. A full anaphoric strategy was determined when nominals were used to switch the reference and pronouns were to maintain reference. Indeterminable was for those that did not fit into the above four categories, in which subjects seemed to apply more than one strategy so that the use of pronouns or nominals was inconsistent.

**Data Analysis**

For the semantic-appropriate conjunctions, results obtained were analyzed with both descriptive statistics and Mann-Whitney U test to determine whether there was any significant difference among four groups, N4;06 versus N6;00, MR4;06 versus MR6;00, N4;06 versus MR4;06 and N6;00 versus MR6;00. The dependent variables were a) density of semantic-appropriate conjunctions, and b) proportion of various types of conjunctions. The .050 level of significance was adopted. However, for the error analysis of the conjunctions and pronominal strategies, due to the small sample size that could be recruited
conjunctions and pronominal strategies, due to the small sample size that could be recruited in each of the group (n per cell=10) and low occurrence of targets, descriptive statistics, instead of inferential statistics, were used.

Reliability

Thirty percent of the transcription of the samples were coded and scored a second time by the researcher after two weeks in order to establish the intra-judge reliability. An agreement of 92.6% was noted. Ten percent of the samples were coded by one Year four students studying Speech & Hearing Sciences in order to establish inter-judge reliability. An inter-judge agreement of 90.5% was established.

Results

Conjunction

![Figure 1](image)

**Figure 1.** Mean of density of conjunctions among four groups.

Figure 1 demonstrated the mean of conjunctive density in four groups. Older retarded children exhibited significantly higher density than younger retarded children (U=14, p<.01). Young retarded children produced significantly lower density than young normal peers (U=3, p<.01).

Percentage of different types of conjunctions

Table 2 summarized the percentage of various types of conjunctions in the retarded and normal children. A general increase in the use of adversative and causal conjunction from aged 4:06 to 6:00 in both groups was noted. At the same time, there was also a general
decrease in the use of temporal conjunctions from aged 4;06 to 6;00.

Table 2  Mean Values of the Density and Proportion of Various Types of Conjunctions employed by Four Groups of Children

<table>
<thead>
<tr>
<th>Measures</th>
<th>MR4;06</th>
<th>MR6;00</th>
<th>N4;06</th>
<th>N6;00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>.133</td>
<td>.345</td>
<td>.527</td>
<td>.502</td>
</tr>
<tr>
<td>Appropriate</td>
<td>.908</td>
<td>.908</td>
<td>.896</td>
<td>.956</td>
</tr>
<tr>
<td>Additive</td>
<td>.083</td>
<td>.065</td>
<td>.050</td>
<td>.104</td>
</tr>
<tr>
<td>Temporal</td>
<td>.844</td>
<td>.745</td>
<td>.787</td>
<td>.615</td>
</tr>
<tr>
<td>Causal</td>
<td>.019</td>
<td>.117</td>
<td>.128</td>
<td>.154</td>
</tr>
<tr>
<td>Adversative</td>
<td>.053</td>
<td>.073</td>
<td>.035</td>
<td>.128</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>.092</td>
<td>.092</td>
<td>.104</td>
<td>.044</td>
</tr>
</tbody>
</table>

Table 3  Probability Level of four groups of comparison measured by Mann-Whitney U test

<table>
<thead>
<tr>
<th>Measures</th>
<th>N4;06-N6;00</th>
<th>MR4;06-MR6;00</th>
<th>N4;06-MR4;06</th>
<th>N6;00-MR6;00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriate</td>
<td>.250105</td>
<td>.584441</td>
<td>.667403</td>
<td>.153720</td>
</tr>
<tr>
<td>Additive</td>
<td>.156262</td>
<td>.232293</td>
<td>.232293</td>
<td>.421004</td>
</tr>
<tr>
<td>Temporal</td>
<td>.037428 *</td>
<td>.274037</td>
<td>.353829</td>
<td>.256132</td>
</tr>
<tr>
<td>Causal</td>
<td>.470672</td>
<td>.014608 *</td>
<td>.025481 *</td>
<td>.518952</td>
</tr>
<tr>
<td>Adversative</td>
<td>.011146 *</td>
<td>.215818</td>
<td>.765670</td>
<td>.147545</td>
</tr>
<tr>
<td>Inappropriate</td>
<td>.250105</td>
<td>.584441</td>
<td>.667403</td>
<td>.153720</td>
</tr>
</tbody>
</table>

Note: N4;06-N6;00 = N4;06 compared with N6;00; MR4;06-MR6;00 = MR4;06 compared with MR6;00; N4;06-MR4;06 = N4;06 compared with MR4;06; N6;00-MR6;00 = N6;00 compared with MR6;00

* p< .05

Table 3 summarized the results of Mann-Whitney U test performed among the four groups. Normal children aged 6;00 produced significantly lower proportion of temporal conjunctions but higher proportion of adversative conjunctions than normal children aged 4;06 (p< .05). Retarded children aged 4;06 produced significantly lower proportion of causal
conjunctions than both retarded children aged 6;00 and normal children aged 4;06 (p < .05).

Error Analysis

Table 4  Percentage (and number of occurrence) of error types in conjunctions demonstrated by the retarded and normal children

<table>
<thead>
<tr>
<th>Error type</th>
<th>MR4;06</th>
<th>MR6;00</th>
<th>N4;06</th>
<th>N6;00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic errors</td>
<td>42.86% (3)</td>
<td>63.16% (12)</td>
<td>34.62% (9)</td>
<td>50.00% (4)</td>
</tr>
<tr>
<td>Syntactic errors</td>
<td>0.00% (0)</td>
<td>0.00% (0)</td>
<td>11.54% (3)</td>
<td>37.50% (3)</td>
</tr>
<tr>
<td>Pragmatic use</td>
<td>28.57% (2)</td>
<td>36.84% (7)</td>
<td>42.31% (11)</td>
<td>0.00% (0)</td>
</tr>
<tr>
<td>Others</td>
<td>28.57% (2)</td>
<td>0.00% (0)</td>
<td>11.54% (3)</td>
<td>12.50% (1)</td>
</tr>
</tbody>
</table>

Table 4 revealed that semantic and pragmatic use were two main error types occurred in retarded and normal groups. Semantic errors increased with increasing age in both retarded and normal children.

Pronominal Reference

Table 5  Percentage (and number of occurrence) of pronominal strategies used by four groups of children in two stories

<table>
<thead>
<tr>
<th>Strategy</th>
<th>MR4;06</th>
<th>MR6;00</th>
<th>N4;06</th>
<th>N6;00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confused</td>
<td>30.00% (6)</td>
<td>0.00% (0)</td>
<td>10.00% (2)</td>
<td>0.00% (0)</td>
</tr>
<tr>
<td>Nominal</td>
<td>5.00% (1)</td>
<td>45.00% (9)</td>
<td>15.00% (3)</td>
<td>10.00% (2)</td>
</tr>
<tr>
<td>Thematic-subject</td>
<td>30.00% (6)</td>
<td>30.00% (6)</td>
<td>35.00% (7)</td>
<td>30.00% (6)</td>
</tr>
<tr>
<td>Full-anaphoric</td>
<td>0.00% (0)</td>
<td>10.00% (2)</td>
<td>0.00% (0)</td>
<td>35.00% (7)</td>
</tr>
<tr>
<td>Indeterminable</td>
<td>35.00% (7)</td>
<td>15.00% (3)</td>
<td>40.00% (8)</td>
<td>25.00% (5)</td>
</tr>
</tbody>
</table>

Table 5 summarized the percentages of pronominal strategies used by children in the four groups. For both normal and retarded children aged 4;06, confused, nominal and thematic-subject strategies were common pronominal strategies used. They together comprised about 60% of the total. For normal children aged 6;00, 35% applied full-anaphoric, 30% adopted thematic-subject and 10% used nominal strategy, whereas for retarded children aged 6;00, 10% used full-anaphoric, 30% applied thematic-subject and
45% adopted nominal strategy. Indeterminable strategy decreased across the two ages in both population groups.

Discussion

The results of the present study revealed that mentally retarded children showed a developmental pattern in the use of conjunctions and pronominal reference. Younger retarded children demonstrated more preliminary use of conjunctions and reference, while older ones used more advanced cohesive use. However, their development was less obvious and considered as delayed when compared with that of the linguistically-matched normal children.

Conjunctions

Density of conjunction. Retarded children demonstrated a significant increase in density of conjunctions from language age of 4;06 to 6;00. As their linguistic and cognitive abilities improved, retarded children became more mature language user and started to aware of the story structure. They became aware of making the discourse as a cohesive whole and tried to relate the meaning existed between clauses. More conjunctions were used to link up the narrative, thus resulting in an increase in density of conjunctions in the discourse.

When comparing the developmental patterns of retarded children with those of normal controls from language age of 4;06 to 6;00, one might be interested with the finding that normal children demonstrated stable performance in conjunctive density, while retarded children showed gradual development. As noticed by Tsze (1997), normal children would increase their conjunctive density from aged three to five and then decrease it gradually from five to nine. The decrease in conjunctive density in older children was attributed to children's awareness of the unnaturalness of employing too many explicit conjunctions to link up the discourse (Tsze, 1997). Therefore, as their language proficiency improved, older children would decrease their use of conjunctions and apply other natural means of
coordination. Firstly, they would start to employ cohesive items such as utterance-particle ' AttributeError' in sentence-initial position to replace for the original slot of conjunctions (Tsze, 1997).

Secondly, they would try to achieve cohesion by expressing relations implicitly. Although there was no similar significant decline in conjunctive density occurred in normal children in the present study, as Tsze demonstrated in hers, stable performance across the selected age range was revealed from normal children. It seemed that conjunctive density exhibited by normal children in this study was plateau, which might suggest that normal children has acquired certain knowledge of avoiding linking up text with too many conjunctions. Thus, they were said to be at a more advanced level than retarded children with the same age range in conjunctive density. In other words, retarded children exhibited a delayed developmental pattern in their conjunctive density compared with that of linguistic-matched normal peers.

Percentage of various types of conjunctions. Retarded children also demonstrated a developmental trend in the use of conjunction types, although their development was not as obvious as that in the normal group. In this study, older retarded children were found to produce significantly more causal conjunctions than younger ones. In fact, they also produced fewer temporal conjunctions than younger children, though the difference was not significant. Generally speaking, younger retarded children relied mostly on temporal conjunctions, while older retarded children, in contrast, exhibited increasing proportion of causal conjunctions, together with temporal conjunctions, to coordinate the narratives. This conjunction shift reviewed that conjunctive usage in these children's narratives changed from early dependence on temporal relationship between events to more causally-linked chains of events (Peterson & McCabe, 1991). As pointed out by Piaget (1972), such a change was highly related to cognitive maturity in these children as they grew up. Children with language age 4;06 were functioning at early preoperational stage. Their egocentric nature of thinking, which was limited to personal and immediate experience, inhibited them
from taking perspective of others or interpreting cause-effect relationships of events competently. Therefore, they tended to relate events simply in temporal sequence, resulting in predominantly use of temporal conjunctions. In contrast, retarded children with language age of 6;00 were much more able to reason, think logically and perceive relationships between events due to their decreased egocentrism (Piaget, 1972). Characters’ intention, belief, motivations and reactions could be interpreted more accurately and hence the older retarded would demonstrate more use of complex conjunctions such as causal than the younger retarded.

Retarded children with language age of 4;06 produced significantly less causal conjunctions than the controls with the same age in this study. It seems that producing causal conjunctions required relatively more cognitive demand than temporal or additive conjunctions, and it thus could tap the difference between the two population groups better than the other measures. In fact, this finding was unexpected and contradicted with findings conducted by Hemphill et. al. (1991) and Nwokah (1982). Since these authors suggested that retarded children performed similarly in their use of conjunctions as the matched controls, one would expect no difference would be found between retarded and normal subjects at both language ages in all conjunction types. Such discrepancies might be related to the methodological issues. The coding system might have played a significant part in influencing the results. In Hemphill et. al.’s (1991) and Nwokah (1982)’s studies, it was the form of conjunctions, rather than the semantic meaning of conjunctions, to be considered. That meant each form of conjunction such as ‘because’, ‘so’, ‘and’ was counted separately. As different forms of conjunctions could express the same semantic relationship (Halliday & Hason, 1976) and semantic classification of conjunctions was widely adopted in recent researches, this study seemed to provide a more comprehensive coding of conjunction use. This might help to account for why difference in conjunctive use occurred in this study, but
Error Analysis. In this study, retarded children produced only about 10% semantic-inappropriate conjunctions. In fact, the amounts of errors produced in each age group in either retarded or normal children was small. This finding contradicted with studies conducted in Western countries, which suggested that inappropriate conjunction use was a common phenomena in young children in both normal and disordered population. For example, Peterson & McCabe (1985) reported that 40% of the conjunction 'because' and 62% of 'so' produced by three-to-nine years old normal children consisted of syntactic or semantic errors. Peterson (1986) also discovered that 43% of the conjunction 'but' exhibited by children aged three to five was semantic-inappropriate and most were misusing adversative connectives for causal or precausal relationships. Liles (1985b), in addition, found that normal and language-disordered children exhibited a proportion of conjunctive errors in their narratives. These authors attributed such a high occurrence of errors to the hypothesis that young children was incapable of relating character's relationship to each other and how events could be organized in discourse (Liles, 1985b). Another interesting finding was that no developmental patterns were found in the usage of inappropriate conjunctions across the selected age range in either retarded or normal group. That meant no significant decrease was revealed with increasing age in both population groups. This was unexpected since studies in Western countries revealed that percentages of inappropriate conjunction use decreased as age increased in either normal or disordered population (Peterson & McCabe, 19). Possible explanation on these two issues might be related to the special property of the Cantonese conjunctions (Tsze, 1997). As mentioned by Matthew & Yip (1994), relationships between clauses in Cantonese are usually expressed by juxtaposition of phrases. As a result, it was not necessary in Cantonese to use conjunctions in marking relationships explicitly. As the chance to use conjunctions obligatorily reduced, the
possibility of making errors might also reduced (Tsze, 1997), thus resulting in fewer errors occurred in both Cantonese retarded and normal children in this study. Another hypothesis was due to the different methodology used. In most of the studies mentioned previously, personal narratives or conversation were used, while story retelling was adopted in this study. According to Merritt and Liles (1989), story retelling required lower cognitive load, which was easier for children to manage. Thus it might not able to tap the breakdown of conjunctive use in retarded children to the same extent as personal narratives or conversation did.

An error analysis performed across inappropriate conjunctions revealed some interesting observations about the nature of errors produced by retarded children in this study. Generally speaking, apart from ‘others’ category, pragmatic use and semantic errors were the most common error types occurred in retarded children. Most of the pragmatic use demonstrated by these retarded children (in fact, demonstrated by normal children as well) involved the use of ‘然後(then)’ to indicate continuity in the discourse without temporal meaning. A high percentage of pragmatic use in these children’s narratives was not surprising as Peterson & McCabe (1991) claimed that young children usually used conjunctions both pragmatically and semantically in narratives. This phenomena occurred because children, during narration, must hold the floor to avoid interruptions by listeners to show clarification inquiries, encouragement to continue, indications of interest, or prompts for specific important information that have been missed out (Peterson & McCabe, 1991). This would smooth narration as children signaled listeners when a narrative began as well as when it ended.

There seemed to be a developmental trend occurred in the retarded children, with semantic errors increased as language age increased. This was because they tended to mix up meanings and forms as these children learned more conjunctions. The proportion of semantic
errors thus increased. Nevertheless, due to the limited number of conjunction errors elicited, the finding on this issue was thus quite preliminary. Further studies with a larger corpus were recommended to confirm the results.

**Pronominal Reference**

Retarded children exhibited a developmental trend in the use of pronominal strategies, although the trend was not as obvious as the normal. Most obviously, retarded children demonstrated decreased use of indeterminable strategy as normal did with increasing language age. This was because older retarded children, with improved linguistic and cognitive abilities, could cope with the use of reference more competently than younger ones, and thus avoided using several strategies inconsistently in one story. Another developmental pattern revealed was that retarded children showed a shift of pronominal strategies to a more advanced use. At the language age 4;06, they mostly applied confused, nominal or thematic-subject strategies, while at 6;00, a majority of them changed to rely on thematic-subject or full-anaphoric strategies. Their emergence of a more sophisticated strategy at the language age of 6;00 was attributed to their better mastery of the reference in the discourse due to their more proficient linguistic, pragmatic and cognitive abilities as language age increased. Older children had a firmer understanding of how the characters and events were related in the stories and were more aware of the potential ambiguity of the reference in their narratives. They therefore tried to make the message clearer by introducing new characters with nominals and then linking these mentioned referents up with a pronoun (Bamberg, 1986).

Comparing the performance of retarded children with linguistically-matched normal, it was found that retarded children performed similarly as their normal peers at 4;06, but performed more preliminarily than their normal peers at 6;00. At the language age of 4;06, the two groups of children demonstrated similar percentages of confused, nominal or
thematic-subject strategies. At the language age of 6;00, they employed fewer anaphoric strategy (only 10% in the retarded compared with 35% in the normal). This represented the special characteristics of retarded children in mastering reference. Generally speaking, the finding obtained in the reference was consistent with that conducted by Hemphill et. al. (1991), in which retarded children applied less anaphoric strategy than normal at around six to seven-years old.

**Poorer Performance of Retarded Children**

Concluding the results from measures of conjunctions and pronominal reference that presented previously, it seemed that retarded children demonstrated poorer performance with their linguistically-matched normal peers. What contributes to their poorer performance in cohesion? The following were some plausible explanations.

**Cognitive competence.** Cognition is important in determining children’s ability in using appropriate cohesion. In this study, mastering conjunctions required understanding of the relationship between events, cause and consequences in the stories (Peterson & McCabe, 1991). It also involved knowledge of characters’ feelings, intentions, responses or thoughts (Tager-Flusberg & Sullivan, 1995). Managing reference, on the other hand, required understanding of the plot structure, underlying knowledge of characters and their roles in events (Hemphill et. al., 1991). As noted by many researchers, retarded children’s cognitive development was found to be delayed (Zigler, 1969, cited in Owens, 1997). In fact, a number of studies (Connis, 1979, Spitz, 1966, Belmont, 1966, Stephens, 1972, cited in Owens, 1997) have indicated that retarded children exhibited poorer attention, short-term memory, generalization skills as well as organization techniques for later-recall information. These cognitive limitations might cause them become less proficient in mastering cohesion. With inferior cognitive ability, retarded children might just think of the relationship between events and characters explicitly, instead of getting into the abstract and implicit knowledge.
Consequently, they tended to apply conjunctions mostly just to link events temporally, and managed the reference by either using nominal forms to refer to the character at every time it appeared or just fixing the subject slot of the protagonist by using pronouns.

**Linguistic competence.** According to Hemphill et. al. (1991), story retelling “required linguistic knowledge, including control of tense shift and mastery of the complex sentence that mark temporal and causal relations.”(p. 264) Thus, abilities to recognize the rule of linguistic structures and applying them appropriately in narratives were important in the mastery of cohesion in this study. Ingram (1972, cited in Owens, 1997) reported that retarded children generally demonstrated poor linguistic ability, which was suggested to be related to their poor linguistic rule generalization. This deficiency might play a part in accounting for their poorer cohesive use, as it inhibited their application of appropriate conjunctions and reference forms during narratives. In addition, as Liles (1985a) discovered that there was correlation between knowledge of story grammar and cohesive use in narrative production, inferior comprehension skills in retarded children might be another possible reason for their poorer performance in cohesion use.

**Pragmatic competence.** Perspective-taking was another important element in determining children's success in the mastery of cohesion in narratives. During narration, children needed to aware of listeners' expectation and took his or her responsibilities of communicating clearly (Hemphill et. al., 1991). In this study, in order to let listeners understand the narrative, children must provide explanation on the cause-effect relationship of events by using appropriate conjunctions, as well as signaling a shift in the character's role by alternating nominal or pronominal forms (Hemphill et. al., 1991). As pointed out by McLean and Synder-McLean (1978, cited in Owens, 1997), retarded children demonstrated deficits in social functioning, and they were found to be weak in judging nonverbal emotions of listeners than their mental age matched normal peers. Their delayed pragmatic functioning
thus restricted them to understand listener's perspectives and their responsibility as a narrator. As a result, it built up barrier for them to become sophisticated in mastering cohesion competently.

**Environmental factors.** Other than inferior cognitive, linguistic and pragmatic abilities mentioned earlier, environment might place a role in influencing the performance. In fact, it was well documented in Western countries that environment had influences on children's language performance (Conroy, Efthimiou & Lemanowicz, 1982, cited in Owens, 1991). As reported by the subjects during conversations, it was found that retarded children commonly received less chance of narrating stories to either parents or teachers than normal children. This reduced practice and experience to narration might be a possible cause of their poorer performance in cohesive use. In addition, in most kindergardens, much emphasis was placed on academic achievement, while in special schools, in contrast, a large proportion of time was spent on functional aspects such as self-care, perceptual motor training and independent living skills. (Curriculum Developmental Council, 1997). Such difference in school curriculum might also affect the results. These two environmental factors might help to account for the group difference in this study, to certain extent.

Smith and Wilson (1973, cited in Patton & Thomas, 1994) reported that frequent inner ear infections and occasional resultant hearing impairment were common in mental retardation populations, especially those with Down's syndrome. One might then start to argue the possibly of hearing problems that cause the group difference in this study. As hearing-impairment would hinder retarded children to perceive knowledge verbally, language acquisition on cohesion, would be affected. This would thus lead to their poorer performance in their mastery of cohesion in narratives. However, this suggestion seemed unlikely as no subject recruited in this study had Down's syndrome or reported to have any known hearing problems. Besides, none of them appeared to have any hearing-related
difficulties during conversations. Middle ear inflection during childhood, thus, could not account for the group discrepancy in this study.

As a summary, inferior cognitive abilities, language proficiency, pragmatic skills and reduced exposure were four possible reasons concluded to cause the poorer cohesive use performance in retarded children in this study.

Clinical Implications

This study provided preliminary information on the development of conjunction and pronominal reference in mildly mentally retarded children. Information obtained could shed some lights on the selection of suitable conjunction types or pronominal strategy for these children in the therapeutic process. It also gave insights on assessment planning as examination of narrative was found to be a useful and sensitive tool for assessing language use beyond sentence level. Besides, this study suggested that cognitive maturity, language proficiency, pragmatic abilities and environmental factors were important factors to be taken into account during examination of retarded children’s narrative skills.

Limitations of the Study

There were several limitations of this study. Firstly, only ten subjects were recruited in each group. Such a small sample size would make the generalization of the findings to the whole population difficult. Secondly, as the sample size is small, inferential statistics could not be taken on the measures of error analysis and pronominal strategy. Thirdly, the age range selected was narrow. It might not demonstrate a complete developmental pattern in the two population groups. Fourthly, the subjects recruited in this study were matched on linguistic ability but not mental age, and so one might question about the influence of cognitive achievement on their cohesion use. Finally, being limited by the small sample size, the influence of individual variability such as children’s personality or talkativeness might contribute to the group difference noted.
Further Investigations

This study provided only exploratory information on the development of cohesion in mildly retarded children. Further studies on the same topic with a larger population can be conducted to confirm the findings. As conjunctions and personal reference were just two parameters that were used as measures in this study, further investigation can be targeted on other cohesive devices such as ellipsis, lexical cohesion and substitution. Researches focusing on comparing the narrative performance of normal and retarded children in terms of story grammar or propositional analysis could also be a constructive topic. Besides, according to Liles (1993), narratives could be affected by a variety of factors, including media input (oral/ pictorial), response output (oral/ written), medium (storytelling/ story-retelling) and elicitation procedures (personal narratives/ narrating a wordless film/ narrating a story book). How these variables affected the narrative performance in retarded children would give a fruitful area for research. Finally, this study could be expanded to other disordered population such as children with autism, language-impairment or specific language impairment.

Conclusion

This study compared the ability to produce cohesive narrative between mentally retarded and normal children, using conjunctions and pronominal strategy as measures. It also studied the development of these two measures in these two populations. Both retarded and normal children were found to demonstrate similar developmental trend in which older subjects exhibited more variety of conjunctions and applied more sophisticated way of linking up narratives than younger ones. This was due to their increased awareness of the intralinguistic relation in the discourse. However, retarded children tended to perform worse than their linguistically-matched normal peers in the two measures in terms of their achievement level. Inferior cognitive abilities, linguistic proficiency, pragmatic knowledge.
and reduced chance of practice were four possible reasons concluded that might cause them less competent in organizing cohesive narratives.

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Appendix A

Guidelines for Coding and Analysis

Extracting the narrative core. For easier analysis, the narrative sample collected was extracted by applying the procedures described by R. Wong (1993). Some modifications were made. The following items are excluded when extracting the narrative corpus, as they did not represent the linguistic levels of the subject’s narratives:

a. Utterances that are direct responses to prompts or direct questions by the experimenter.

Utterances that seemed to copy the structure of experimenter’s utterances are also extracted.

The subject’s response in the following exchange was omitted:

e.g. Experimenter: 小芬想去……

Siu Fan want……

Child: 小芬想去游泳

Siu Fan want to swim.

On the other hand, the subject’s response in the following exchange is retained, as the prompts are just to guide the subject to speak more:

e.g. Experimenter : 跟住點呀?

What’s next?

Child : 佢地走去撈灘

They go to the beach.

b. Comments or questions that the subject makes on the narrative during the retelling task. For example, 唔知 (don’t know), 冇喇 (nothing), 請咗喇 (tell already), 唸個咩嘅嘅? (What is this?).

c. All “starters” that the child used habitually, e.g. [ε₂], [ε₃|ε₄]

d. All repairs that the subject makes on the narrative. Categories of repairs are as follows (the brackets indicated the parts that are deleted):
1. Repetition: All the repetitions are eliminated except the final occurrence of the repeated word, fragment or sentence. Repetition is retained when it is used for emphasis.

   e.g. 媽媽唔得閒費整蛋糕 [一齊整蛋糕] 一齊整蛋糕

   Mother does not have time to make cake, make cake together.

   However, the repetition in the following case is retained as it is used for emphasis:

   e.g. 咪咪 蹦蹦

   He go to play football, play like this.

2. Interruptions: only the complete clause or the more complete fragment is scored.

   e.g. 咪咪 小芬

   He found Siu Fan.

3. Amendments: Amendments are scored only.

   e.g. 弟弟想 小明想去踢波

   Brother want to play football.

4. Elaborations: The most elaborated fragment is scored.

   e.g. 妹妹 放落去 放啲蛋落去

   Mother put the cake into the bowl.

**Segmenting into clauses**

The extracted utterances were then segmented into clauses by primarily applying the procedures described by M. Wong (1990). A clause is a basic grammatical unit for analysis and was commonly used in past Cantonese researches. According to M. Wong (1990), "Semantically, a clause usually represents an action, an event or a state. Syntactically, a clause contains a single nuclear predicate around which other predicate-like items may cluster without themselves constituting independent predicates. A predicate in spoken Cantonese can be a verb or an adjective." (p.54) Here are some examples:

   e.g. 星期六 小明踢波
On Saturday, Siu Ming play football.

e.g. 之後佢就好開心

After that he was very happy.

Complex sentences are divided into several clauses as follows:

a. Co-ordinate sentence is segmented into two clauses.

eg. 佢唔腳又傷左  個波又爛左

His foot was hurt, his ball was broken.

b. Subordinate sentence is segmented into two clauses.

e.g. 雖然佢冇得去踢波  但係冇得食蛋糕

Although he could not go to play football, he can eat cake.

e.g. 媽媽唔得閒  要煮飯

Mother does not have time, she needs to cook.

e.g. 去到沙灘之後  爺爺孃孃家姐小芬一齊見到好多人

After they reached the beach, grandfather, grandmother, sister and Siu Fan saw a lot of people.

c. Embedded sentence is segmented into separate clauses.

e.g. 媽媽話  爺爺孃孃家姐陪小芬去游泳

d. Serial verb construction is considered as one clause as follows:

e.g. 佢可以喺埋小芬一齊整

He can ask Siu Fan to make it together.

Incomplete clauses will be excluded for further analysis.

Coding for interclausal conjunctions:

Here are some guidelines of deciding a conjunction is appropriate or not:

e.g. 雖然佢整個波，所以佢呢就俾雪糕佢食
Siu Fan Cry

爺爺就走去買雪糕給他

Grandfather go to buy him an ice-cream

Here, the 就 is considered as adverbial conjunction denoting causal function.

However, in the following case,

e.g. 星期六小明就去公園踢波

On Saturday Siu Ming go to park to play football

Here, the 就 is not considered as conjunction. It behaved as an adverb demonstrating the necessity of the action.

Coding for semantic-inappropriate conjunctions:

Here are the guidelines for coding:

1. ‘Semantic errors’ are identified if the child used incorrect form to code for the meaning expressed.

   e.g. 跟住先加啲落去，於是撈個爐去入便

      Then first add something, so put it into the oven

      Here the conjunctive relation was temporal, but the child use inappropriate form (causal form) to denote it. It is a semantic error.

2. ‘Syntactic errors’ are noted if the child used incorrect pairs of conjunctions or place the conjunctions in a wrong position.

   e.g. 小芳喊，因為爺爺就走去買雪糕給他

      Siu Fan cry, because grandfather buy him an ice-cream.

      Here the conjunction 因為 is placed in a wrong position. It also lacks another conjunction 所以. It is a syntactic error.

3. ‘Pragmatic use’ is revealed if the conjunctions serve some pragmatic functions.
Coding for semantic-appropriate conjunctions

Here are some examples of conjunctions:

Table 1. Examples of conjunctions

<table>
<thead>
<tr>
<th>conjunction</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additive</td>
<td>同 (and), 同埋 (and), 仲 (also)</td>
</tr>
<tr>
<td>Temporal</td>
<td>閃住 (then), 終於(ultimately), 之後 (then), 然而 (then)</td>
</tr>
<tr>
<td>Causal</td>
<td>因為...所以 (because...so), 因為 (because), 所以 (so), 於是 (so)</td>
</tr>
<tr>
<td>Adversative</td>
<td>雖然...但係 (although...but), 但係 (but), 不過 (however)</td>
</tr>
</tbody>
</table>

Several counting criteria were made to cope with specific features in Cantonese conjunctions.

1. In Cantonese, double conjunctions are common. (Matthews & Yip, 1994). Double conjunctions such as “because...so”, “although...but” are counted as one, as only one conjunctive relation is expressed between clauses.

2. In Cantonese, co-occurrence of conjunctions is common in adult’s speech. Co-occurrence of conjunctions that served the same function is counted as one conjunction, as only one conjunctive relation is expressed. For example, 跟住然後洗麪粉 (Then he make flour)

3. Co-occurrence of conjunctions that served different functions is counted as two conjunctions. Two conjunctive relations are expressed. For example, 跟住雖然小明冇得去踢波 (then although Siu Ming cannot go to play football)

4. In Cantonese, conjunctions are hardly distinguishable from prepositions or adverbs (Chao, 1968). For example, 就 can act as a general-purpose conjunction denoting temporal and causal functions, apart from being adverb (Matthew & Yip, 1994). Coding for 就 was based on Bloom et. al.’s (1980) “inferential process of interpretation”. That is, if their occurrence does serve the function of expressing conjunctive relations between clauses, they would be coded as conjunction with that specific semantic relation in this study. Here are the examples:

   e.g. 小芬喊
Although he broke the ball, he gave him ice-cream.

The conjunctive relation here was adversative, but the child use incorrect pairs of conjunctions to denote it.

\textit{e.g.} 爷爺買雪糕俾佢食，跟住佢好開心

Then he placed the thing, so put it into the oven.

Here the conjunctive relation was temporal, but the child use inappropriate form (causal form) to denote it.

\textit{e.g.} 爷爺買雪糕俾佢食，跟住佢好開心

Grandfather gave him ice-cream, then he was happy.

There is a causal relationship between the conjoined clauses. It is not specific enough to use temporal marker. However, it does not infer opposite meaning to the story. The sentences could be interpreted as two temporal events were joined together. \textit{跟住 (then)} is hence classified as appropriately-used.

\textit{e.g.} 雖然佢整個波，但係佢都有雪糕食

Although he broke the ball, he can have ice-cream to eat.

There is an adversative relationship between the conjoined clauses and the child use correct form (adversative) to denote it. No syntactic errors were noted. \textit{雖然...但係 (although...but)} is hence classified as appropriately-used.
e.g. 小芬叫佢媽咪，問住佢問媽咪

Siu Fan call her mom, then she ask her.

Here the relationship seemed not to be explicitly temporal, but the conjunction 跑住(then) serves some kind of pragmatic functions: It hold the floor and imposes continuity of the discourse. It helps to make a narrative cohesive and coherent.

4. ‘Others’ is denoted if the conjunctions used could not fit in the above three categories.

e.g. 小明雖然星期六去公園踢波，佢走去揾媽咪

Although Siu Ming go to play football, he go to find mom.

Here the conjunction 雖然(although) did not serve any particular semantic or pragmatic functions.
Appendix B

Materials

Story A

星期六小芬想去海灘游水

於是佢就去揼媽媽陪佢去喇

但係媽媽因為要煮飯

所以唔可以陪小芬去

咁媽媽就提議小芬去揼爺爺孻孻同家姐

咁跟住小芬就走去揼爺爺孻孻同家姐陪佢去喇

佢地去到海灘

見到好多多人

小芬首先去游水

然後走去踢波

但係佢一唔小心跌左落地

整個左個波
Story B

星期六小明想去公園踢波

於是佢就去揾小芬陪佢去喇

佢係小芬因為要做功課

所以唔可以陪小明去

咁小芬就提議小明去揾媽媽同姨姨

咁跟住小明就去揾媽媽同姨姨陪佢去喇

佢係媽媽係度整蛋糕

唔得閒

佢叫小明不如一齊整

佢地首先揀埋啲蛋同麵粉

然後揀麵粉

跟住又將啲麵粉放入焗爐度焗

最後佢地終於整好個蛋糕喇

仲叫埋小芬一齊食嘢

小明雖然冇去到公園踢波

佢係佢就整啲個蛋糕

覺得好開心
Appendix C

Measures

1. Conjunctions

a. Density of semantic-appropriate conjunctions

\[ \text{Density} = \frac{\text{no. of semantic-appropriate conjunctions}}{\text{no. of complete clause}} \]

b. Proportion of semantic-appropriate conjunctions over total number of conjunctions

\[ \text{Proportion} = \frac{\text{no. of semantic-appropriate conjunctions}}{\text{no. of semantic-appropriate conjunctions} + \text{no. of semantic-inappropriate conjunctions}} \]

c. Proportion of each type of semantic-appropriate conjunctions

\[ \text{Proportion} = \frac{\text{no. of each type of conjunctions}}{\text{no. of total semantic-appropriate conjunctions}} \]

d. Proportion of semantic-inappropriate conjunctions over total number of conjunctions

\[ \text{Proportion} = \frac{\text{no. of semantic-inappropriate conjunctions}}{\text{no. of semantic-appropriate conjunctions} + \text{no. of semantic-inappropriate conjunctions}} \]

e. Proportion of each type of semantic-inappropriate conjunctions in each group

\[ \text{Proportion} = \frac{\text{no. of that type of error}}{\text{no. of total semantic-inappropriate conjunctions}} \]

Pronominal Reference

Percentage of each pronominal strategy in each group

\[ \text{Percentage} = \frac{\text{no. of that pronominal strategy}}{\text{total occurrence of pronominal strategy}} \times 100\% \]