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<td>Ngan, Yuk-hing, Candy</td>
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Phonological Awareness in Native Cantonese-Speaking Children in Hong Kong

Candy NGAN Yuk Hing

A dissertation submitted in partial fulfilment of the requirements for the Bachelor of Science (Speech and Hearing Sciences), The University of Hong Kong, April 30, 1992.
ABSTRACT

Phonological awareness in native Cantonese-speaking children in Hong Kong was studied using tasks of syllable deletion, rhyme detection, rhyme production, onset detection, onset production and phonemic deletion. Eighteen primary one children and eighteen primary six children were tested individually. Primary six children, in general, performed better than primary one children, except, on the rhyme detection and onset detection tasks, where there was no significant difference between the performance of the two groups. The phonemic deletion task was very difficult for both groups of children. The results suggested that skills in syllable deletion, rhyme and onset detection may develop as a manifestation of cognitive development while ability to perform phonemic deletion may require some skills in reading an alphabetic system. The children's performance in the rhyme production task revealed possible developmental sequence of rhyming skills in Cantonese-speaking children. Implications of the findings and limitations of this study were discussed.
Phonological awareness is the awareness of the internal phonological structure of words (Mann, 1986). It embraces the knowledge that words comprise syllables, onsets (initial consonant or consonant cluster of a syllable), rhymes (vowel and any following consonant), phonemes and presumably, in languages such as Cantonese, tones. A literature review of studies on phonological awareness yields three hypotheses about the development of phonological awareness.

1. **Phonological awareness develops as a function of cognitive development**

   One hypothesis is that the acquisition of phonological awareness follows a strict or predictable developmental pattern and sequence. Evidence supporting this hypothesis comes from studies by Hakes, Evans and Tunmer (1980), Tunmer and Herriman (1984) and van Kleeck (1984). For example, in the study by Hakes, et al. (1980), children between the ages of four and eight years undertook a conservation task (a commonly used measure of cognitive development) and a phonemic segmentation task. The results provided a positive relationship between their performance in the conservation task and the phonemic segmentation task, thus suggesting that children's phonological awareness increases in line with cognitive development. However, this hypothesis has some weaknesses. These children aged five to eight years were also learning to read. Therefore, the increase in phonological awareness may not be solely the result of
cognitive growth but may also be a consequence of their learning to read an alphabetic system.

2. Phonological awareness develops as a result of learning to read an alphabetic orthography

An alternate hypothesis, that increases in phonological awareness result from learning to read an alphabetic orthography, was tested in studies of children learning different alphabetic orthographies (e.g. English and Russian). Results showed dramatic progress during the years when children started learning to read (Morais, Cary, Alegría and Bertelson, 1979). However, this finding might equally reflect improvement in phonological awareness is an outcome of cognitive development. Thus, the two factors: cognitive development and alphabetic reading instruction, are confounded in developmental studies of phonological awareness in children learning alphabets.

3. There are different levels of phonological awareness, some develop independently of reading an alphabetic orthography while others require the experience of reading an alphabetic orthography

A third hypothesis postulated by Bryant and Bradley (1985a) suggests that there are different levels of phonological awareness. Some levels of phonological awareness may precede reading alphabets or be independent of this ability while the others may follow and be the result of learning to read an alphabetic orthography.
Based on current research findings, the third hypothesis, suggesting that different levels of phonological awareness develop as a function of age and exposure to reading instruction, seems to be the most supportable one. First, preschool children were able to perform syllable segmentation (van Kleeck, 1984), and to detect rhyme and onset before they began to learn to read (Bryant and Bradley, 1985b; Dowker, 1989, Lenel and Cantor, 1981). This showed that some phonological awareness precedes reading. Second, the experience of learning to read improved children's understanding of the phonological structure of sounds (Bryant and Bradley, 1985a).

Bryant and Bradley's (1985a) hypothesis was also supported by studies which compared speech segmentation ability of people who are literate with those who are illiterate in alphabetic system. Morais, Bertelson, Cary and Alegria (1986) administered a battery of tasks requiring speech segmentation to a group of illiterate and ex-illiterate adults (people who attended literacy classes as adults). They found that both groups had similar sensitivity to rhyme and analysis into syllables, but the ex-illiterate group performed better in the analysis into phonetic segments than the illiterate group. This suggested that some levels of phonological awareness (syllable segmentation and rhyming tasks) can develop up to some point in the absence of reading experience while others (e.g. phonemic segmentation) require that experience.
In summary, based on the studies of English-speaking children and of adults who are illiterate in alphabetic system, syllable segmentation, rhyme and onset detection are not dependent upon the ability to read alphabetically, whereas the ability to perform phonemic segmentation seems to require some skills in reading and writing an alphabetic orthography.

At present, little is known about the development of phonological awareness in children learning the logographic Chinese, which does not demand explicit phonetic analysis. A developmental study of segmentation and rhyming skills in children learning a logographic system provides an opportunity to test the three hypotheses.

Children in Hong Kong learn to speak in Cantonese (a dialect of Chinese) and to read and write written Chinese (a logographic writing system which represents words at a syllabic level). Basically, Chinese is the medium of instructions in primary education while English is learned as a second language in school. Thus, children in Hong Kong have limited instruction to reading English during their primary education.

The present study was designed to investigate the phonological awareness of native Cantonese-speaking children in Hong Kong and to answer the following questions:

(1) To what extent can these native Cantonese-speaking children identify the phonological structure of speech in tasks involving segmentation and rhyming?
(2) Are there differences in performance related to levels of education?

It examined performance of two groups of Hong Kong children on a series of segmentation and rhyming tasks. One group consisted of children at primary one level and the other at primary six level.

Predictions:

There were two predictions about the performance of Cantonese-speaking children in this study:

(1) Studies of English-speaking children (Tunmer and Herriman, 1984) show that by primary six, children perform perfectly on all tasks. A positive correlation between educational level and phonological awareness would confirm that phonological awareness reflects general cognitive development, reading experience or both acting together.

(2) Studies of phonemic analysis in Chinese adults (Read, Zhang, Nie and Ding, 1986) and illiterate adults (Morais, et al., 1979, 1986) revealed that skills in syllable segmentation and detection of rhyme and onset can develop without having experience in alphabetic reading but the ability to perform phonemic segmentation requires that experience. Thus, it leads to the prediction that Cantonese-speaking children in Hong Kong, who received limited instructions in reading alphabets, would do poorly in the phonemic deletion task. Their performance in the syllable deletion and
the rhyme and onset detection tasks would be much better than in the phonemic deletion task because the former tasks do not necessarily require the experience of learning to read alphabetically whereas phonemic deletion does.

METHODS

Subjects

Thirty six children from three local primary schools and a day-care centre in the Central and Eastern districts of Hong Kong Island (for details, see Appendix 1) took part: 18 at primary one level (mean age 6;7 years, age range 6;3-7;2 years) and 18 at primary six level (mean age 11;6 years, age range 11;2-11;11 years). Subjects were all native Cantonese-speaking children with no known or reported hearing, developmental, academic or intellectual problems.

Materials

Subjects undertook six tasks (for details, see Appendix 2):

1. Syllable deletion -- Subjects were asked to delete one or two syllables from a Cantonese bisyllabic or polysyllabic word (for example, to delete "kj" [sai,] from the word "jki" [sai, kwa,]).

2. Rhyme detection -- Subjects were asked to say four monosyllabic words (such as "k" [ts'e,], "ka" [tsi,], "k" [ts'e,], "ki" [sai,]). The first one was the target to which one of the other three rhymed. The subject was asked to select the one that rhymed with the
target word.¹
A pilot study showed that children in Hong Kong did not understand the term "押韵" (rhyme) in Cantonese. Therefore, the phrase "同尾同音字" (words that end with the same sound) was used in the instructions to explain the concept of rhyme.
Additionally, a detailed explanation giving examples of rhyming words (e.g. "好" [tsʰeː], "远" [tseː]) and non-rhyming words (e.g. "书" [tsʰeː], "妮" [sɔː]) was used to clarify the instructions.
3. Rhyme production — Subjects were asked to repeat a word (for example, "花" [fa]) and then to generate rhyming words (such as [ka], [kwa], [sa]). As in the rhyme detection task, an explanation was given before the instructions. The experimenter allowed 30 seconds for subjects to say rhyming words for each stimulus.
4. Onset detection — The experimenter said a target sound (phoneme) and two monosyllabic words (for example, the /f/ sound and the words "企" [ka] and "花" [fa]). Only one of the words began with the target phoneme. No visual (placement) cues were provided. The subject was

The rhyme detection task required children to remember the words and categorize their sounds. A memory task, followed the rhyme detection task, was used to test the subjects' auditory memory. This task was designed to ensure that subjects could remember the words for sound categorization. The subject was asked to recall the six sets of four words immediately after the experimenter.
asked to select the word containing the target sound. Explanations and examples were given to help children understand the task.

5. Onset production -- Subjects were asked to repeat a target sound (such as /s/) and then to generate words starting with it (for example, "沙" [sa], "些" [se]). A detailed explanation was used to clarify the instructions. The experimenter allowed 30 seconds for subjects to say words starting with the target sound for each stimulus.

6. Phonemic Deletion -- Subjects were asked to delete the initial or final segment of a syllable. Results of pilot study showed that children in Hong Kong did not understand this task if they were given only the instructions. Therefore, a detailed explanation showing explicit phonetic analysis was used to clarify the instructions.

Procedures

The children were tested individually and all six tasks were completed in one session. The experimenter began by talking with the child to obtain background information and to check his/her listening and speech ability.

The experimenter introduced the experiment to the child:

"我想了解你可唔可以聽懂。例如我話「山」，你話「山」，或者我話「水」，你話「水」，你可唔可以話「山」、「水」呢？我想你盡量去做，話出每個你認為係啲啲答案就得嘅喇。"
"I want to know how well you can listen to and say some sounds. I have a total of six tasks for you to do. Among the six tasks, some of them are easy to do and some of them may be difficult. I want you to try your best, just tell (me) what you think is the correct answer for each task."

A standard procedure was developed from the results of the pilot study. Most tasks had three practice trials and six test trials. An explanatory trial was included in all the tasks except the syllable deletion task, which was easily understood by children from the practice trials. An additional practice trial was provided in the phonemic deletion task as from the pilot study, it was the most difficult task.

Feedback:

In the practice trials, the experimenter indicated whether the children were attending to the relevant part of the stimulus or whether the verbal response was appropriate. When necessary, the experimenter repeated the instruction and modelled responses. The children were asked to repeat the model. During testing, the experimenter gave general encouragement but did not indicate correct or incorrect responses.

Task order:

Task order was counterbalanced using a 6x6 Latin square. Six different orders of task presentations were adopted.
Scoring procedure

Raw scores were given to each task for preliminary statistical analysis. On each task, only the six test items were scored. Each item was scored 0 or 1. A value of 0 was assigned for no response or for incorrect response. A value of 1 was assigned for response that equals to the target response. Thus, the minimum score was zero and the maximum score was six for each task.

RESULTS

Figure 1 shows the performance of the two groups of children on the six tasks.

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In the rhyme production and onset production tasks, children gave several different responses to a stimulus. These include both appropriate and inappropriate responses. In order to simplify the procedure for preliminary statistical analysis, a strict scoring criterion was adopted for these tasks: children scored credit for an item if they could produce one response close to the target regardless of how many target responses they produced.
As predicted, mean scores of the two groups revealed that in general, primary six children performed better than primary one children, except on the onset detection task, where both groups had the same mean scores. Both groups of children had the highest mean scores on the syllable deletion task. They scored higher on the detection of rhyme and onset than on the rhyme production and phonemic deletion tasks. Again, as predicted, extremely poor performance was found on the phonemic deletion task, suggesting that this was the most difficult task for Cantonese-speaking children. This preliminary interpretation of the data was substantiated by the following statistical analysis.

A three-way analysis of variance (ANOVA) of Educational Level x Task x Task Order, i.e. 2 x 6 x 6, with repeated measures on the last two factors was carried out. The predicted results were as follows:

(1) in general, primary six children would perform better than primary one children,

(2) performance on the syllable deletion, rhyme and onset detection tasks would be better than that on the phonemic deletion task.

The predicted results would be reflected in significant effects for Educational Level and Task in the analysis.

The results of the three-way ANOVA of Educational Level x Task x Task Order is given in Table 1. The effect of Educational Level was highly significant, $F(1, 144) = 24.12$. 
$p = .0001$, with primary six children scoring significantly higher than primary one children (see Figure 1). Task effect, $F(5,144) = 144.45$, $p = .0001$, and the Educational Level x Task interaction, $F(5,144) = 3.25$, $p = .0082$, were also significant. The effect of Task Order and other interactions did not reach significance (all $ps > .10$).

**Table 1** Summary table for the three way analysis of variance of Educational Level x Task x Task Order

<table>
<thead>
<tr>
<th>Variable</th>
<th>df</th>
<th>Sum of Squares</th>
<th>Mean square</th>
<th>$F$</th>
<th>$p$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
<td>1</td>
<td>30.3750</td>
<td>30.3750</td>
<td>24.12</td>
<td>.0001*</td>
</tr>
<tr>
<td>Task</td>
<td>5</td>
<td>909.5231</td>
<td>181.9046</td>
<td>144.45</td>
<td>.0001*</td>
</tr>
<tr>
<td>Order</td>
<td>5</td>
<td>5.1898</td>
<td>1.0380</td>
<td>0.82</td>
<td>.5343</td>
</tr>
<tr>
<td>Task x Level</td>
<td>5</td>
<td>20.4861</td>
<td>4.0972</td>
<td>3.25</td>
<td>.0082*</td>
</tr>
<tr>
<td>Level x Order</td>
<td>5</td>
<td>1.9306</td>
<td>0.3861</td>
<td>0.31</td>
<td>.9083</td>
</tr>
<tr>
<td>Task x Order</td>
<td>25</td>
<td>16.6713</td>
<td>0.6669</td>
<td>0.53</td>
<td>.9674</td>
</tr>
<tr>
<td>Task x Level x Order</td>
<td>25</td>
<td>21.3750</td>
<td>0.8550</td>
<td>0.68</td>
<td>.8707</td>
</tr>
</tbody>
</table>

*Key*: Level = Educational Level  
Order = Task Order

* $p < .01$

Comparison of primary one and primary six children's performance on each task

A one way ANOVA of Educational Level on each task was carried out. The results are shown in Tables 3 to 8.
Table 3  One way analysis of variance of Educational Level on the syllable deletion task

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>1.3611</td>
<td>1</td>
<td>1.3611</td>
<td>4.13</td>
<td>.017</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>7.3889</td>
<td>34</td>
<td>0.2173</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>8.7500</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4  One way analysis of variance of Educational Level on the rhyme detection task

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between groups</td>
<td>3.3611</td>
<td>1</td>
<td>3.3611</td>
<td>4.13</td>
<td>.198</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>66.2778</td>
<td>34</td>
<td>1.9494</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>69.6389</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5  One way analysis of variance of Educational Level on the rhyme production task

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>p</th>
</tr>
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<tr>
<td>Between groups</td>
<td>12.2500</td>
<td>1</td>
<td>12.2500</td>
<td>4.13</td>
<td>.025</td>
</tr>
<tr>
<td>Error (within groups)</td>
<td>76.0556</td>
<td>34</td>
<td>2.2369</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>88.3056</td>
<td>35</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>
The performance of primary one and primary six children differed significantly on the syllable deletion task, $F(1, 34) = 4.13, p < .05$, rhyme production task, $F(1, 34) = 4.13$,
p < .05, onset production task, F(1, 34) = 4.13, p = .000, and phonemic deletion task, F(1, 34) = 4.13, p < .05. No significant difference was found between their performance on the rhyme detection and onset detection tasks (for both tasks, ps > .10). Children in both groups performed comparably in the onset detection task (F(1,34) = 4.13, p = 1.000).

Overall, the results support the hypothesis that there is a developmental difference in phonological awareness in Cantonese-speaking children, with skills in detection of rhyme and onset acquired at or before primary one level. Skills in explicit phonetic analysis (such as phonemic deletion and production of rhyme and onset) continue to develop during primary school years.

Further analysis of the Task effect

From the results of the three way ANOVA (See Table 1), Task effect was highly significant, F(5, 144) = 144.45, p = 0.001. This means that the six tasks differ in difficulty. Tukey's Studentized Range (HSD) Test was used to determine a hierarchy of task difficulties.

The results of Tukey's Test for the scores of primary one children and primary six children are given in Table 9 and Table 10 respectively.
Table 9  Results of Tukey's Studentized Range (HSD)
Test for scores obtained by primary one children

<table>
<thead>
<tr>
<th>Tukey Grouping</th>
<th>Mean</th>
<th>N</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5.5556</td>
<td>18</td>
<td>syllable deletion</td>
</tr>
<tr>
<td>A</td>
<td>5.4444</td>
<td>18</td>
<td>onset detection</td>
</tr>
<tr>
<td>A</td>
<td>4.5000</td>
<td>18</td>
<td>rhyme detection</td>
</tr>
<tr>
<td>B</td>
<td>3.6111</td>
<td>18</td>
<td>onset production</td>
</tr>
<tr>
<td>C</td>
<td>0.7778</td>
<td>18</td>
<td>rhyme production</td>
</tr>
<tr>
<td>C</td>
<td>0.2222</td>
<td>18</td>
<td>phonemic deletion</td>
</tr>
</tbody>
</table>

* Means with the same letter are not different at .05 significant level.

Table 10  Results of Tukey's Studentized Range (HSD)
Test for scores obtained by primary six children

<table>
<thead>
<tr>
<th>Tukey Grouping</th>
<th>Mean</th>
<th>N</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5.9444</td>
<td>18</td>
<td>syllable deletion</td>
</tr>
<tr>
<td>A</td>
<td>5.5000</td>
<td>18</td>
<td>onset production</td>
</tr>
<tr>
<td>A</td>
<td>5.4444</td>
<td>18</td>
<td>onset detection</td>
</tr>
<tr>
<td>A</td>
<td>5.1111</td>
<td>18</td>
<td>rhyme detection</td>
</tr>
<tr>
<td>B</td>
<td>1.9444</td>
<td>18</td>
<td>rhyme production</td>
</tr>
<tr>
<td>C</td>
<td>0.6667</td>
<td>18</td>
<td>phonemic deletion</td>
</tr>
</tbody>
</table>

* Means with the same letter are not different at .05 significant level.
Overall, the results of Tukey's tests revealed that for both groups of children, performance on the syllable deletion, onset detection and rhyme detection tasks was significantly better than that on the rhyme production and phonemic deletion tasks. Extremely low scores were found on the phonemic deletion task. This supports the hypothesis that tasks involving explicit analysis at a phonemic level (such as phonemic deletion) are the most difficult for Cantonese-speaking children, who do not have specific training on explicit phonetic analysis.

Further analysis of children's performance on the rhyme production task

Interesting results were found in children's responses to the rhyme production task. Children produced different types of responses. Some of the responses showed the characteristics of a tonal language (e.g. children varied the tone of the given word while keeping the segmental features constant when they were asked to give rhymes for it). As a result, two different analyses were made on the rhyme production task.

In the first analysis, a strict scoring criterion was adopted. Children scored credit for an item only if they could provide a target response, as follows:

Target Response = response (word) in which the initial segment only differs from the given word, the tone and the rest of the syllable are unchanged.
e.g. given word: "\textsc{\texttt{tse}}" (umbrella) [tse,]
response: "\textsc{\texttt{fe}}" (brown) [fe,]

This scoring procedure was adopted in order to simplify the procedure for the statistical analysis described above.

In a second analysis, different types of responses given by the children to the rhyme production task were categorized and a distribution of the different response types was found. The response categories were:

1. No Response
2. Unrelated Response = response does not relate, either semantically or phonologically, to the given word
   e.g. given word: "\textsc{\texttt{tse}}" (mouth) [ts\textsc{\texttt{o}}]
   response: "\textsc{\texttt{mau}}" (cat) [mau,]
3. Target Response -- as described above
4. Tone Change = response contains the same segments as the given word but the tone is changed
   e.g. given word: "\textsc{\texttt{tse}}" (umbrella) [tse,]
   response: "\textsc{\texttt{sce}}" (sister) [tse,]
   or "\textsc{\texttt{tsce}}" (borrow) [tse,]
5. Onset and Tone Change = response has both initial segment and tone different from the given word
   e.g. given word: "\textsc{\texttt{tou}}" (knife) [tou,]
   response: [hou,]
6. Semantically Related Response = response is semantically related to the given word
   e.g. given word: "\textsc{\texttt{tou}}" (knife) [tou,]
   response: "\textsc{\texttt{tsa}}" (fork) [tsa,]
7. Other = response does not belong to the above categories. Some examples of children's responses in this category were:
a) children make sentences/ phrases with the given word,
   e.g. given word: "vf" (cough) [k\textipa{t}]  
   response: "*v" (not cough) [\textipa{t}]

b) children give a homophone for the given word,
   e.g. given word: "JJ^" (umbrella) [tse],
   response: "4it~iaL41 #, " (sister)
   or " 4^1^ *%

The distribution of the different types of responses to the rhyme production task is given in Figure 2.

Responses from both groups of children revealed that among the three phonologically related responses, children tended to provide more Tone Change response than Target Response, which in turn, was more than Onset and Tone Change response.

The results showed that primary one children gave more Semantically Related Responses and Other responses. This indicated that they might not have understood the task instructions.

Further analysis of children's performance on the phonemic deletion task

There was a great variation between children's performance on the phonemic deletion task (primary one: mean score = 0.22, SD = 0.43 ; primary six: mean score = 0.67, SD = 0.69). In the primary one group. four children had one item correct. Three were able to delete the final consonant /m/ from the word "\. The other one child was able to correctly delete /a/ from the word "\.
Figure 2 Distribution of the different types of responses given by primary one and primary six children to the rhyme production task.
In the primary six group, two children had two correct items and eight children had only one correct. Overall, nine of them were able to delete the final consonant /m/ from the word "A\[t^am\]."

A total of 14 children in this study were able to correctly complete one or two items of the phonemic deletion task. Twelve of these children had learned either English pronunciation and/or Hanyu pinyin. This suggests that the ability to perform phonemic deletion requires skills in reading an alphabetic system such as English and Hanyu pinyin.

**DISCUSSION**

The results support the hypothesis that there are different levels of phonological awareness, some develop independently of reading an alphabetic orthography while others require the experience of reading an alphabetic orthography.

The children's performance in the syllable deletion, rhyme detection and onset detection tasks was significantly better than that in the phonemic deletion task. Moreover, their performance in the phonemic deletion task was extremely poor. This might be related to the fact that children in Hong Kong have limited instruction to reading alphabets. Among the fourteen children who were able to

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3Hanyu pinyin is an official alphabetic writing system to represent the phonemic structures of the Beijing dialect in Chinese.
correctly complete one or two items on the phonemic deletion task, twelve had specific training on alphabetic reading (English and / or Hanyu pinyin). This suggests that alphabetic reading instruction enhances phonemic analysis. The results are consistent with those studies reporting that acquisition of skills in explicit phonemic analysis requires alphabetic reading experience (Morais, et al., 1979, 1986 and Read, et al. 1986) whereas skills in syllable deletion and detection of rhyme and onset may develop without that experience (Morais, et al. 1986).

Morais, et al. (1979, 1986) and Read, et al. (1986) studied the adults' performance in phonetic analysis. Their studies could not provide any information about the developmental aspect of phonological awareness and reflect whether awareness of phonological structures is an all-or-none phenomenon or whether it is a gradual process.

Given the limitations in previous studies, the present study on Cantonese-speaking children is much more direct to indicate that alphabetic reading instruction stimulates phonemic analysis.

Moreover, another concern of this study was with development of phonological awareness in these children. The results reveal that children's phonological awareness increases from primary one to primary six. Results of the one way ANOVA further support a developmental difference in phonological awareness in Cantonese-speaking children, with skills in detection of rhyme and onset acquired at or before
primary one level. Skills in explicit phonetic analysis (such as phonemic deletion and production of rhyme and onset) continue to develop during primary school years. These findings substantiate the claim that awareness of phonological structures is not all-or-none (Lenel and Cantor, 1981). Improvement in phonological awareness with educational level appears to be a gradual process rather than an abrupt change from no to perfect performance.

Interesting results were obtained from the rhyme production task. Cantonese-speaking children in this study tried to vary the onset and/or the tone of a word when they were asked to produce rhymes. They tended to provide more Tone Change response than Target Response (response that have a different initial segment from the given word), which in turn, was more than Onset and Tone Change Response. This suggests that perception of rhyme in Cantonese-speaking children may be quite different from English-speaking children because Cantonese words involve tones. This hierarchy of rhyming skills (change tone > change initial segment > change both the initial segment and tone) may lead one to speculate a gradual process in the development of rhyming skills in Cantonese-speaking children. That is, when these children are learning to produce rhymes, they may find it easier to change the tone first before they are able to vary the initial segment of a word. After they have acquired these skills for some time, they may be able to combine them together and to provide rhyming words that vary
both the tone and the initial segment.

Implications

In summary, results of the present study support that phonological awareness develops as a function of cognitive development and exposure to reading alphabetic instruction. (Bowey and Francis, 1991; Bryant and Bradley, 1985a). On one hand, the results indicate that children's ability to perform explicit phonemic analysis does not develop in the absence of alphabetic reading instruction. This implies that alphabetic reading instruction, even if not a prerequisite, is probably the most efficient means of stimulating phonemic awareness (Bowey and Francis, 1991). On the other hand, the developmental difference and the children's sensitivity to rhyme and onset evidenced suggest that some form of phonological awareness can develop gradually. This implies that cognitive development also plays a role in phonological awareness. Thus, the hypotheses that phonological awareness develops solely as a function of cognitive development or it develops solely as a function of reading alphabetic orthography are not correct. Children's sensitivity to phonemic structure of language cannot be developed without specific instruction on reading alphabets (Bowey and Francis, 1991). However, specific instruction may not be effectual before some critical developmental stages. As suggested by Morais, et al. (1979), at the initial stages of the learning process, a
cognitive capacity for "becoming aware" is the precondition for the acquisition of phonemic analysis. Thus, the relationship between learning to read and developmental changes in phonological awareness is a reciprocal one.

Applications

The present study provided information about the awareness of phonological structures in native Cantonese-speaking children in Hong Kong. It suggests that we can expect Cantonese-speaking children, even at primary one level, to be able to perform syllable deletion, rhyme and onset detection. However, we need to be aware that Cantonese-speaking children, unlike English-speaking children, will find difficulty with explicit phonemic segmentation, such as phonemic deletion tasks. Such information on Cantonese phonological awareness is valuable clinically. It reminds therapists to avoid using teaching strategies that assume phonological awareness skills clients do not have.

Limitations, and implications for further research

There are some limitations in this study. First, this is only a small-scale study. The context in which the data were collected was quite restricted. Second, children were assumed to be able to comprehend the instructions and to be equally attentive to all six tasks (the implementation on all the tasks usually lasts for 30-40 minutes). There is a possibility that the instructions were not understood and
that children may lose attention before the end of the experiment. Thus, it may be better to conduct testing in two sessions and allow more response time.

It would be valuable to conduct a training study with Cantonese-speaking children in phonemic segmentation and synthesis, and to determine responsiveness. This would help in the design of more appropriate treatment programme for articulation disorders in Cantonese and in the teaching of English reading and writing.
REFERENCES


ACKNOWLEDGEMENT

I am very grateful to the principals of T.W.G.Hs. Lee Sai Chow Memorial Primary School, St. Matthew's Primary School, St. Charles Primary School and the centre-in-charge of the Boys' and Girls' Clubs Association of H.K. (Headquarters) for letting me visit the schools / centre and see the children there. I would like to thank Dr. Godfrey Harrison for his comments on the research design and data analysis. Special thanks are due Professor Ann Zubrick for valuable discussions, her comments on an earlier draft of this paper, her help and encouragement.
APPENDIX

Contents:
Appendix 1 Names of schools and centre involved in this study
Appendix 2 Task instruction, items and record form
Appendix 3 Letter of consent (in English and in Chinese)
Appendix 4 Thank you letter for schools and centre
Appendix J

Names of schools and centre involved in this study

T.W.G.Hs. Lee Baj Chow Memorial Primary School
St. Charles Primary School
St. Matthew’s Primary School
Boys’ and Girls’ Clubs Association of H.K. (Headquarters)
Appendix 2

Task Instruction, items and record form.

Introduction

"我想叫你可唔可以聽側同埋跟側我去講—些話呀。
我想佢六個項目佢你就做喺，喺呢六個
项目裏面喺，有些項目都唔容易做喺，而
有些項目喺，你可能會覺得難個嘅嘅喺。
我想你盡量去做，試出每一項你認為係
喺喺嘅，就係喺嘅。

English translation: "I want you to try your best, just tell
me what you think is the correct answer for each task.""

N.B.: Responsive feedback will be given as follows:

1. During practice trials, I will give feedback to indicate
whether P is attending to the relevant part of the
stimulus or whether sufficient detail is given in verbal
responses.

2. During test trials, I will give general encouragement,
but not indicate specifically whether the child is
correct or incorrect in the response.

Key:

T = Experimenter

P = Subject
Task I. Syllable Deletion

Instructions:

T: 你講 XXX

P: XXX

T: 好, 你再講一次。 Good. Now say it again. but

不要講 了.

(Translation: XXX) (the original
di- / tri- / poly-syllabic words)

Three practice trials will be given. The experimenter will give the instructions and the subject will perform the task according to the instructions. If the subject gives the correct response for the first practice trial, T will say,

"講得唔喇。西瓜唔講 "西" 就係 "瓜"." (That's right. "watermelon" but say "west" is "vegetable"

Translation: "That's right. "watermelon" but say "west" is "vegetable"

If P gives the correct response in the second and the third practice trials, T will say,

2nd "講得唔喇。" ("That's right")

3rd "講得幾好。" ("That's fine.

不如我地再試多

個吧."

If P cannot perform the practice trial, T will give the instructions again and model how to perform the task. Then P will be asked to repeat the practice trial as demonstrated by T before moving on to another practice trial.
### Practice Trials

<table>
<thead>
<tr>
<th>Given Words</th>
<th>Omission of</th>
<th>Target Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 西瓜 \ ([sei, kwai] \ [sei_] \ [kwai])</td>
<td>“water melon”</td>
<td>“meat” \ a category of vegetables</td>
</tr>
<tr>
<td>2. 跑馬 \ ([p'nau, ma_] \ [ma_] \ [p'nau])</td>
<td>“horse racing”</td>
<td>“horse” \ “run”</td>
</tr>
<tr>
<td>3. 猪肉 \ ([tsy, juk_] \ [juk_] \ [tsy])</td>
<td>“pork”</td>
<td>“meat” \ “pig”</td>
</tr>
</tbody>
</table>

### Test Trials

<table>
<thead>
<tr>
<th>Given Words</th>
<th>Omission of</th>
<th>Target Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 火車 \ ([fo_ ts\e_] \ [ts\e_] \ [fo])</td>
<td>“train”</td>
<td>“car” \ “fire”</td>
</tr>
<tr>
<td>2. 烟火 \ ([jin, fa_] \ [jin_] \ [fa])</td>
<td>“fireworks”</td>
<td>“smoke” \ “flower”</td>
</tr>
<tr>
<td>3. 公仔 \ ([k\u2013\u2013\u2013 jsi, tim_] \ [min_] \ [key, trei])</td>
<td>“Doll’s” \ “noodle”</td>
<td>“noodle” \ “doll”</td>
</tr>
<tr>
<td>4. 西多 \ ([si_ ts_ pe, lei_] \ [pe_ lei_] \ [si_ to])</td>
<td>“strawberry”</td>
<td>“pear” \ “store”</td>
</tr>
<tr>
<td>5. 士的 \ ([si_ tik_] \ [si_] \ [tik])</td>
<td>“stick”</td>
<td>“stick”</td>
</tr>
<tr>
<td>6. 麦當勞 \ ([ma_ to_ nou__] \ [ma_ to_] \ [nou_])</td>
<td>“McDonald”</td>
<td>“McDonald”</td>
</tr>
<tr>
<td>7. 九星 \ ([k\u2013\u2013\u2013 j\u2013\u2013\u2013 si_]</td>
<td>“nine”</td>
<td>“nine”</td>
</tr>
<tr>
<td>8. 玩具 \ ([p\u2013\u2013\u2013 j\u2013\u2013\u2013 si_] \ [si_]</td>
<td>“toy”</td>
<td>“doll”</td>
</tr>
</tbody>
</table>

*Note: The table and text are filled with Chinese characters and their Pinyin equivalents, followed by English translations*
Task 2: Rhyme Detection

Explanations:  

T: 你講“車、旅”  
P: “車、旅”  
T: “車、旅”  

T: 哪兩個字是，尾後

T: 你还兩個字的尾後

T: 還一個字尾後

Instructions:

T: 你講“X”  
P: “X”  
T: “X”  
T: 好，再來講  
P: “W1, W2, W3”  
T: “W1, W2, W3”  

T: 哪一個字尾後

T: 你同“X”同音嘅？

The explanations will be given before the practice trials. After the explanations are given, the first practice trial will be provided using the above instructions. If the subject gives the correct response for the first practice trial, I will say, “唔嘅嘅，“車、旅”嘅尾後係同音嘅。”

Translation: “That’s right. [tsʰə, tʂə] end with the same sound.”
If the subject cannot do the first practice trial correctly, I will give the instructions again and model how to perform the task. Then P will be asked to repeat the practice trial as demonstrated by T before moving on to another practice trial.

If P gives the correct responses in the second and the third practice trials, I will say:

2nd: "Correct!" ("That's right.")
3rd: "That's fine."
Not bad; I'll try again. Let's do some more.

Practice Trials

<table>
<thead>
<tr>
<th>Target Word</th>
<th>Rhyme + distractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>辛</td>
<td>知道</td>
</tr>
<tr>
<td>[tsʰe]</td>
<td>[tsi]</td>
</tr>
<tr>
<td>香</td>
<td>花</td>
</tr>
<tr>
<td>[sy]</td>
<td>[fa]</td>
</tr>
<tr>
<td>薄</td>
<td>草</td>
</tr>
<tr>
<td>[pou]</td>
<td>[tou]</td>
</tr>
</tbody>
</table>

Test Trials:

<table>
<thead>
<tr>
<th>Target word</th>
<th>Rhyme + distractor</th>
</tr>
</thead>
<tbody>
<tr>
<td>枝</td>
<td>钥</td>
</tr>
<tr>
<td>[fu]</td>
<td>[ku]</td>
</tr>
<tr>
<td>跳</td>
<td>捕</td>
</tr>
<tr>
<td>[thi]</td>
<td>[həy]</td>
</tr>
<tr>
<td>蟹</td>
<td>章</td>
</tr>
<tr>
<td>[mau]</td>
<td>[kwei]</td>
</tr>
</tbody>
</table>
Memory Task

After the test trials, the subject's auditory memory will be tested. He/she will be asked to immediately recall each set of four words after T.

E.g. T 作 语, 答, 鼓, 锺, 铅

P "答, 鼓, 锺, 铅"

English Translations
You say [fu:], [ku:], [so:], [ka:]

[fu:], [ku:], [so:], [ka:]
Task 3: Rhyme Production

Instructions:  

T: 你講 "花"  
T: You say [fa:]  
P: "花"  
P: [fa:]  

T: 好，我們就來做  
T: Good. We now try to  

找一些尾音 "花" 的字  
find some words that end  
尾音 "花"  
with the same sound as  
尾音 "花"  
[fa:]  

例如 "家" "花"  
e.g. [ka:] and [fa:] end  
尾音 "花"  
with the same sound  
尾音 "花"  
[fa:]  

你找到可以尾音 "花" 的字嗎? (給 30 秒鐘)  
Can you find some words  
尾音 "花"  
that end with the same  
音 "花"  
[fa:]  

If P can produce a correct rhyming word(s), the T will say,  

"啞啞 " (the P's correct response(s)) "同 " "啞啞 "  
尾音 "花" 同音 "啞啞 "  
尾音 "花"  
[fa:]  

English Translation: "That's right. "(P's correct response(s))" and [fa:] end  
with the same sound."

Then proceed to second practice trial.

If P cannot produce a correct rhyming word for "花" [fa:]  
after 30 seconds, T will give some more examples  
of rhyming words for "花" [fa:] and then ask P to  
repeat T's model before moving on to the next trial.

If P gives correct rhyming words for the second and the third  
practice trials, T will say,  

2nd: "啞啞 " ("That's right")
General instructions for trials: (English translations):

T: 你講 "X"  T: You say "X" (given word
P: "X"  P: "X"

T: 好，有哪幾字頭 T: Good, which words
尾尾頭同 "X" 你同  that end with the same
尾尾頭同  sound as "X"?

(given: 30 seconds
for each trail)

Practice Trials:

<table>
<thead>
<tr>
<th>Given word</th>
<th>Examples of rhyming words</th>
</tr>
</thead>
<tbody>
<tr>
<td>花 [fa]</td>
<td>家, 花, 义, 虾, 爸, 沙, 瓜, 番</td>
</tr>
<tr>
<td>豆 [teu]</td>
<td>狗, 口, 酒, 角, 手, 醋, 油, 椰</td>
</tr>
<tr>
<td>腰 [jiu]</td>
<td>锅, 腰, 保, 炒, 象, 植, 嫁</td>
</tr>
</tbody>
</table>

Test Trials:

<table>
<thead>
<tr>
<th>Given word</th>
<th>Examples of rhyming words</th>
</tr>
</thead>
<tbody>
<tr>
<td>哥 [ket]</td>
<td>袋, 贡, 贺, 股, 一, 七, 也, 室</td>
</tr>
<tr>
<td>佳 [tse]</td>
<td>短, 超, 该, 也, 也</td>
</tr>
<tr>
<td>力 [tou]</td>
<td>煤, 高, 劈, 铺, 群</td>
</tr>
<tr>
<td>右 [to]</td>
<td>稀, 活, 载, 合</td>
</tr>
<tr>
<td>吻 [tray]</td>
<td>女, 水, 取, 服, 腿</td>
</tr>
<tr>
<td>滤 [tse]</td>
<td>桌, 融, 滤, 咖, 啡, 咖, 嘀</td>
</tr>
</tbody>
</table>

3rd: "講得真好." ("That's fine.")
Task 4: Detection of Phonetic Target in Spoken Words

* I should cover the mouth when saying the words so that no visual cues are provided.

Instructions: (English translation)

T: I will say a sound to you.
Then I will read aloud some words. I want you to find out which word has the sound I am looking for.

T: 我要講一個音標 T: I now say a sound to you.
然後我會說一些 T: Then I will read aloud some
話要你找出這個字 T: words. I want you to find out which word has
的音標. T: the sound I am looking for.

例如：個 /s/ 音 T: For example, the /s/ sound.
以我講一個 "妹" 字呢？ T: I say the word [sɔ].
就有一個 /s/ 音嗎？ T: It has the /s/ sound at...
/s=ɔ/ T: the beginning. /s=ɔ/.

好啦，聽我講第三個字！ T: Well... let's listen to another
"哥"，呢個字就有個 T: word [kɔ]. The word does not have the /s/
/s/ 音嗎？ /kɔ/ T: sound. /kɔ/.

所以呢，如果我問 T: therefore, if I ask...
以下這個字係有個 T: "which one of the following words has the
個 /s/ 音呢？ /s/ sound?"
"哥" "妹" "粗"

它就係 "妹" 字有個。 T: It is "climb" [sɔ] that has
個 /s/ 音。 /s/ the /s/ sound.

T: 請多個例，以下邊 T: Take another example, which one
個字係有 /pʰ/ 音呢？ T: of the following words has the
音呢？ /pʰ/ sound?
"爬" "含" "climb" [pʰɔ], "take" [tək]
If $P$ cannot give the correct response, then the $T$ will repeat the instruction and model how to do this trial. Then $P$ will be asked to repeat $T$'s model before moving on to the next practice trial.

**Practice Trials:**

1. /s/:
   - 粉 /fən/ 读 /duː/ 以 下 這 個 字 條 有 哪 個 音 呢？

2. /pʰ/:
   - 花 /huː/ 花 /huː/ 以 下 這 個 字 條 有 哪 個 音 呢？

3. /l/:
   - 落 /ləə/ 落 /ləə/ 以 下 這 個 字 條 有 哪 個 音 呢？

**Test Trials:**

<table>
<thead>
<tr>
<th>Target sound</th>
<th>Word pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>/ʃ/</td>
<td>花 /huː/ (flower)</td>
</tr>
<tr>
<td>/f/</td>
<td>花 /huː/ (flower)</td>
</tr>
<tr>
<td>/pʰ/</td>
<td>花 /huː/ (flower)</td>
</tr>
<tr>
<td>/l/</td>
<td>落 /ləə/ (fall)</td>
</tr>
<tr>
<td>/s/</td>
<td>落 /ləə/ (fall)</td>
</tr>
<tr>
<td>/pʰ/</td>
<td>花 /huː/ (flower)</td>
</tr>
<tr>
<td>/kʰ/</td>
<td>花 /huː/ (flower)</td>
</tr>
<tr>
<td>/pʰ/</td>
<td>花 /huː/ (flower)</td>
</tr>
<tr>
<td>/pʰ/</td>
<td>花 /huː/ (flower)</td>
</tr>
</tbody>
</table>
Task 5: Production of words that start with a target sound.

Instructions: 

T: 你講 /s/  

P: /s/  

T: 好，有啲字呢係由 /s/ 音開始嘅。  

例如：

/s/ 絲，個“絲”字係由 /s/ 音開始嘅。  

/s/ 沙，個“沙”字係由 /s/ 音開始嘅。  

你有啲字呢係由 /s/ 音開始嘅呢？

English Translation:

T: You say /s/  

P: /s/  

T: Good. Some words are started with the /s/ sound.

For example:

The word [sam] is started with the /s/ sound.

Also started with the /s/ sound.

What other words are started with the /s/ sound?

(Given: 30 seconds)

If P can give correct responses, I will say:

"啲系啲 " (P’s responses) "係由 /s/ 音開始."  

(Bilingual translation: "That's right. "(P’s responses)" is also started with the /s/ sound.

If P cannot give the correct response out of 30 seconds,  

I will give three more examples:

/s/ 絲  

/s/ 沙  

/s/ 筍

and ask the P to repeat T’s model before moving on to the next trial.
### Practice Trials:

<table>
<thead>
<tr>
<th>Given sound</th>
<th>Examples of target words</th>
</tr>
</thead>
<tbody>
<tr>
<td>/s/</td>
<td>小, 沙, 砂, 沙土, 沙滩</td>
</tr>
<tr>
<td></td>
<td>[sam], [sa], [si], [so]</td>
</tr>
<tr>
<td>/k/</td>
<td>犬, 桑, 染, 线, 逐</td>
</tr>
<tr>
<td></td>
<td>[kan], [ken], [kon], [kon]</td>
</tr>
</tbody>
</table>

### Test Trials:

<table>
<thead>
<tr>
<th>Given sound</th>
<th>Examples of target words</th>
</tr>
</thead>
<tbody>
<tr>
<td>/t/</td>
<td>太, 火, 树, 眼</td>
</tr>
<tr>
<td></td>
<td>[ta], [ta], [fu], [fun]</td>
</tr>
<tr>
<td>/l/</td>
<td>梨, 鸟, 六, 拉</td>
</tr>
<tr>
<td></td>
<td>[lei], [lin], [lu], [la]</td>
</tr>
<tr>
<td>/p/</td>
<td>猫, 缓, 皮, 堆</td>
</tr>
<tr>
<td></td>
<td>[pin], [pin], [pei], [pa]</td>
</tr>
<tr>
<td>/ts/</td>
<td>车, 义, 底, 鑫</td>
</tr>
<tr>
<td></td>
<td>[tse], [tse], [tse], [the]</td>
</tr>
<tr>
<td>/m/</td>
<td>妈, 马, 林, 镜</td>
</tr>
<tr>
<td></td>
<td>[mai], [ma], [mam], [mau]</td>
</tr>
<tr>
<td>/t/</td>
<td>跳, 趴, 推, 他, 倒, 天</td>
</tr>
<tr>
<td></td>
<td>[tin], [bin], [tib], [tin]</td>
</tr>
</tbody>
</table>
Task 6: Phonemic Deletion

Demonstration by T:

T: 1. If you have a sound /s/ after a sound /ʃ/, it should be /ʃə/.  
   trials...

  English translation: If the sound /s/ is followed by /ʃ/, it makes /ʃə/.  
  This /ʃə/ you say it again, but don't say /ʃ/.  
  It should be /ʃə/.  

Practice Trials:

1) T: 1. If you have a sound /ʃ/ after a sound /ʃ/, it should be /ʃə/.  
   1. Let's practice...
   2. /ʃəl, /  
   3. Again, /ʃə/.  
   4. How should it? ( /ʃəl )  

2) T: 2. If you have a sound /tʃ/ after a sound /lam/, it should be /tʃam/.  
   1. Let's practice...
   2. /tʃam/.  
   3. Again, /tʃam/.  
   4. How should it? ( /tʃam/ )  

(If the subject cannot give the correct responses for these two practice trials, T will repeat the instructions again, 
and demonstrate to P what the correct responses are.  
Then P will be asked to repeat T's model before...  
moving on to the next trial.)

If P's responses to these two practice trials are correct, 
T will say, "You say it right: "(given word)” and "(the deleted 
phone)” = "(target response)" (rest).  

English translation: "You say it right: "(given word)” and "(the deleted 
phone)” = "(target response)" (rest)."
Instructions for the practice trials 3) & 4) and for the test trials

<table>
<thead>
<tr>
<th>Given word</th>
<th>deletion of</th>
<th>target response</th>
</tr>
</thead>
<tbody>
<tr>
<td>3) 鬼</td>
<td>/si/</td>
<td>[i]</td>
</tr>
<tr>
<td>4) 鬼</td>
<td>/kam/</td>
<td>[ka]</td>
</tr>
</tbody>
</table>

(If the subject can give correct response to practice trial #3 or #4 or to both, he/she can attempt the test trials.)

If the subject cannot give correct response to practice trial #3, I will repeat the instruction and demonstrate to the subject what the correct response is. Then the subject will be asked to repeat. T’s model before moving on to practice trial #4.)
<table>
<thead>
<tr>
<th>Test Trials:</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Given word</td>
<td>deletion of</td>
</tr>
<tr>
<td>1) 花</td>
<td>[fa]</td>
</tr>
<tr>
<td>2) 手</td>
<td>[s]</td>
</tr>
<tr>
<td>3) 食</td>
<td>[t'am]</td>
</tr>
<tr>
<td>4) 糖</td>
<td>[k'wen]</td>
</tr>
<tr>
<td>5) x</td>
<td>[ts'a]</td>
</tr>
<tr>
<td>6) 貓</td>
<td>[mau]</td>
</tr>
</tbody>
</table>
RECORD FORM

BACKGROUND INFORMATION

Name of School: _____________________________

Class: _____________________________

Subject’s no. : _____________________________       Sex: _____________________________

Date of Birth: _____________________________       Age: _____________________________

Date of interview: _____________________________

Linguistic experience:

1. Have you learned English pronunciation? ( Y / N )

2. (Observation) Is there any instructions on English pronunciation given in the textbooks? ( Y / N )

3. Do you like reading story books/magazines? ( Y / N )
   ( English / Chinese )
   ( How many / often ?)

4. Do you have a Filipina maid? ( Y / N )
   ( How long has she been working at your home? )

5. Do you know other languages / Putonghua Pinyin? ( Y / N )

Overall speech intelligibility: Good / Poor

Articulation test: Pass / Fail
Task 1: Syllable Deletion

Practice Trials:
1. 西瓜 / 西瓜
2. 跑步 / 跑步
3. 马肉 / 马肉

Test Trials:
1. 火车 / 火
2. 烟花 / 烟花
3. 公子 / 公子
4. 子女 / 子女
5. 太阳 / 太阳
6. 学霸 / 学霸

Task 2: Rhyme Detection

Practice Trials:
1. 里知 / 原知
2. 彩衣 / 彩衣
3. 萧萧 / 萧萧

Test Trials:
1. 鼓楼 / 鼓楼
2. 飞去 / 飞去
3. 猴爬 / 猴爬
4. 洗七 / 洗七
5. 山重 / 山重
6. 烟方 / 烟方

Task 3: Rhyme Production (30 seconds @)

Practice Trials:
1. 花 / 花
2. 烤 / 烤

Test Trials:
1. 呜 / 呜
2. 仔 / 仔
3. 你 / 你
4. 多 / 多
5. 吩 / 吩
6. 滚 / 滚
Onset Detection

Task 4: (Detection of Phonetic Target in Spoken Words) (cover)

<table>
<thead>
<tr>
<th>Target sound</th>
<th>target + distractor</th>
<th>C's response</th>
<th>target sound</th>
<th>target + distractor</th>
<th>C's response</th>
</tr>
</thead>
<tbody>
<tr>
<td>practice trials: 1. /s/</td>
<td>耳 interim</td>
<td>2. /p/</td>
<td>3. /s/</td>
<td>些 啪</td>
<td>4. /p/</td>
</tr>
<tr>
<td>5. /k/</td>
<td>人 空</td>
<td>6. /p/</td>
<td>婆 水</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Task 5: (Production of Words that Start with a Target Sound)

<table>
<thead>
<tr>
<th>Target sound</th>
<th>C's response</th>
<th>target sound</th>
<th>C's response</th>
</tr>
</thead>
<tbody>
<tr>
<td>practice trials: 1. /s/</td>
<td>2. /k/</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Task 6: (Phonemic Deletion)

Demonstration by T /s + s/ → /s/ (读)

<table>
<thead>
<tr>
<th>Given word / omission</th>
<th>Target</th>
<th>C's response</th>
<th>Given word / omission</th>
<th>Target</th>
<th>C's response</th>
</tr>
</thead>
<tbody>
<tr>
<td>practice trials: 1. s / s</td>
<td>(ok)</td>
<td>2. t / m</td>
<td>打 [ta]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. 舌 / s</td>
<td>[li]</td>
<td>4. 男 / m</td>
<td>家 [ka]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Test trials: 1. 花 / f | 鳥 [ga] | 2. 手 / s | 喂 [ke]
| 3. 食 / m | 吃 [ta] | 4. 椰 / k | 威 [wen]
| 5. 木 / a | [ta] | 6. 狮 / m | [au]

Time:
Dear Principal,

I would like to seek your support to do a small project on the awareness of speech sounds in native Cantonese-speaking children in Hong Kong. The aim of the project is to investigate the ability of Cantonese children to analyse speech sounds in Cantonese. This project will contribute a part of my Bachelor Degree in my final year of studies in the Department of Speech and Hearing Sciences, University of Hong Kong. Any information collected in connection with this project will remain confidential and will be disclosed only for academic purposes.

I have six short tasks that ask the children individually to listen to and say some Cantonese speech sounds. The tasks last for about 30 minutes and no discomfort will result. I can do the tasks with the children at times you can suggest which will cause no disruption.

I would like to see some children at primary one level (age range: 6 yr. 3 mo. - 6 yr. 9 mo.) and primary six level (age range: 11 yr. 3 mo. - 11 yr. 9 mo.), whose listening and speaking ability in Cantonese is considered as normal by the teachers.

I attach a copy of an authorization letter from the University. If it is possible for me to see students at your school, could you kindly return the reply slip to me.

If you have any questions, please feel free to ask me (Tel. no.: 5453439).

Yours faithfully,

Candy Ngan Yuk Hing
Our school * would be willing / would not be willing to participate in a study on the awareness of speech sounds in native Cantonese-speaking children in Hong Kong. (* delete as appropriate)

You can come on the following dates and time:

________________________________________  __________________________________

________________________________________  __________________________________

________________________________________  __________________________________

(Please specify the dates and time that you would like the study to be conducted.)

Name of School: __________________________________________

Name of Principal: __________________________

Signature: __________________________

Date: __________________________