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The development of functional categories in early Cantonese speaking child language

Fong Chung Man

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

This study aimed at studying the growth of functional categories – aspect markers and post-verbal particles in Cantonese speaking children. Four Cantonese-speaking children (aged between 23 months to 32 months) were studied over an eight-month period, using naturalistic speech samples from the existing longitudinal corpus developed by Lee, Leung and Wong (1996). The results showed that Cantonese-speaking children start to acquire functional categories earlier than English-speaking children which verb inflections in English start to emerge after age two (Radford, 1990). The growth in functional categories was documented by the increased frequency of functional categories used, the productivity measure and the error pattern shown in the speech sample. Also, individual differences are found in the children’s use of functional categories.
Introduction

Functional categories have been identified in various languages as problem areas of the grammar for children with Specific Language Impairment (SLI) (Leonard, 1995). In English, lexical items include nouns, verb, adjectives and prepositions while functional categories are those auxiliaries, complementizers, determiners and case particles. However, verb inflections (-s, -ed) should be included in functional categories as they are morphosyntactic structure, which are part of language grammar (Radford, 1990). In English verb inflections specifically have been labeled as clinical marker of SLI (Rice & Wexler, 1996), therefore, we can investigate functional categories in Cantonese-speaking children with SLI to see the underlying grammatical impairment of children with SLI. However, it is important to know what happens in normally developing children. In this study, I will look at the very early stages of development of two functional categories, aspect markers and post-verbal particles in Cantonese.

Radford (1990) has proposed three stages in early language development in English-speaking children.

1. Pregrammatical stage: (generally before 1;08) that is utterances only consist of single word only, there is no evidence of syntactic categorization of verbs and nouns.
2. Lexical stage: (1;08 – 2;00) children start to form productive syntactic structures which production are only sets of lexical items bound together by thematic relation. For example, “baby sit”. Therefore, the early language production of English speaking children is characterized as “lexical-thematic” in nature. At this stage, those non-themed functional categories are absent from early children’s speech, children do not use the verb inflections, determiners and auxiliaries.
Functional stage (after age 2): when children start to reach the functional stage, they will use the verb inflections inconsistently, alternating between grammatical structures and ungrammatical structures. The verb inflections can be identified from their structural properties.

From Rice & Wexler (1996), this showed that normal developing children will increase the use of verb inflections with language growth and they will have arrived at near-adult use of these grammatical morphemes at age 5, at which point, the underlying grammatical rules of verb inflections are fully developed.

Furthermore, based on the developmental sequences proposed by Radford (1990), the non-thematic verb inflections will emerge after age 2, and children will develop the lexical items before these functional categories. Why are these non-thematic functional categories acquired later? It may reflect that functional categories are more difficult to acquire than lexical categories. Hypotheses related to the identifiability of the verb inflections from the acoustic and morphosyntactic aspects suggested that the functional categories are less easy to be identified by children in early stage.

Reasons for the Late Acquisition of Functional Categories

Gleitman and Wanner (1982) pointed out that the functional categories in English are different from the lexical categories acoustically; the lexical categories generally have more salient phonological form that is more readily identifiable than functional categories, as verb inflections (e.g. -s, -ed) are mainly the unstressed syllables, or non-syllabic consonants which should be less identifiable for children and thus acquired later.

From the morphosyntactic aspect, it is proposed that the verb inflections have more morphosyntactic irregularity, for example, in past tense, the regular/irregular
past tense like played/drank, is common in English. However, most of the lexical category remains the same form in all contexts. So it will be more difficult for children to identify the verb inflections in different form than the lexical items (Radford, 1990).

Apart from identifiability, the late acquisition of verb inflections may relate to the cognitive level of the children, as lexical items are more concrete but functional categories are more abstract in nature. This implies the functional categories are cognitively more complex than lexical items, children should have reached certain level of cognitive maturity and thus acquired later (Cinque, 1988). However, this account is being criticized as there is no objective, language independent measurement of the cognitive complexity of the lexical and functional items, the cognitive maturity of the child (Aktinson, 1982).

Radford (1995) proposed the teleological explanation in explaining the late acquisition of functional categories, since verb inflections are the extended projections of verb phrase which lexical items of verb should be appeared first before the verb inflections can develop, so functional categories would be appeared later.

Chomsky’s functional parameterization theory (1989) suggested that the lexical items are in the innate programme in the Universal Grammar. Functional categories acquired later as it requires linguistic experiences before children can form the underlying grammar of the functional categories.

These hypotheses are used to explain the delayed acquisition of functional categories like verb inflections relative to lexical categories in early English-speaking children.
How about the functional growth in Cantonese-speaking children? What is the pattern of Cantonese speaking children in using the verb inflections? According to the Universal Grammar, Cantonese speaking children and English speaking children should use the verb inflections in similar ways and pattern. However, in Cantonese, there is no distinction of tense, so “the notions past, present and future are not encoded grammatically by forms of the verb” (Matthews & Yip, 1994, p197).

Instead, in Cantonese, there is aspect markers used to distinguish notions like the event, states and process. Grammatical aspect marks a verb for a particular viewpoint toward the described situation by the speaker (Smith, 1991). “The choice of aspect marker is determined partly be the context and partly by the speaker’s own choice of how to present the situation” (Mathews & Yip, 1994, p197). Unlike English, the use of the aspect markers are grammatical optional which they can be omitted.

Also, there are post-verbal particles which have similar function as aspect markers, they are used to describe the result and the phase of action (Matthews & Yip, 1994). However, according to Matthews & Yip (1994), aspect markers and post-verbal particles differ syntactically in two aspects. (i) Post verbal particles can be separated from verb by the modal verb 得 dakl and the negative of 唔 m4 like in the phrase 食得晒 sik6 dakl saai3 (can eat all), 食唔晒 sik6 m4 saai3 (can eat all). (ii) Verbal particles can combine with the aspect markers.

According to Radford’s (1990) account, it is believed that Cantonese-speaking children will develop aspect markers and post-verbal particles after lexical category development. If it is assumed that there will be late acquisition in aspect markers and post-verbal particles than the lexical categories, can we use the same hypotheses to
explain the results?

When comparing the acoustic signals of aspect markers and post-verbal particles with the lexical items, there should be no difference between them as in Cantonese, both lexical items and functional categories (aspect markers and post-verbal particles) consist of single syllable and there is no stress difference between them. So the aspect markers and post-verbal particles should be as salient as the lexical items, therefore children should be able to identify them as easily as the lexical items acoustically.

One study comparing the acoustic signals between the production of perfective aspect marker \( \text{不\lower{0.5ex}l\text{-}} z\text{o2} \) with its' homophonous adjective \( \text{左\lower{0.5ex}l\text{-}} z\text{o2} \) (which means 'left') and progressive aspect marker \( \text{著} g\text{an2} \) with the adjective \( \text{著} g\text{an2} \) (which means 'tight') showed that there is no difference between the lexical items (adjective) and the aspect markers acoustically (Lee, 2000).

Also, the form of aspect marker and post-verbal particles remains the same when attached to all kind of verbs, like \( \text{食\lower{0.5ex}l\text{-}} s\text{ik6 zo2} \) (ate), \( \text{玩\lower{0.5ex}l\text{-}} w\text{aan2 zo2} \) (played), \( \text{買\lower{0.5ex}l\text{-}} m\text{ai3 zo2} \) (bought). There should be no difference in Cantonese-speaking children in identifying the functional categories in terms of morphosyntactic regularity.

In Cantonese, aspect markers and post-verbal particles are more abstract than lexical items and more complex semantically too, and this may contribute to the difference in the stage of acquisition. Also, both of them are the projections of the verb phrase, so according to the teleological explanation (Radford, 1995) which should be acquired later. Also, both aspect markers and post-verbal particles are used optionally that Children may also have problem with the optionality of these forms, in determining the condition under which they are to be included in an utterance. And these are the hypotheses explaining the late acquisition of functional categories in
Cantonese-speaking children

**Productivity of Functional Categories**

In language development, how do we address the issue of the availability or otherwise of any functional category empirically? This is a methodological issue not addressed by Radford. Presumably, it can be done by the number of times a form is used like in Brown (1973) children need to meet criterion of using the grammatical structure in 90% of its obligatory contexts. However, aspect markers and post-verbal particles are not obligatory in Cantonese grammar, so that such criterion is not applicable in Cantonese.

However, only based on the frequency of specific language form used may not reflect the language competence of children reliably. As children use adult-like forms of language, it can be either “they have the same underlying linguistics competence as adult or they are imitatively learning from adult” (Tomasello, 2000, p211). The imitative language productions are “rote-learned or morphologically unanalyzed” (Berman & Armon-Lotem, 1995, p37). “Memorization of such chunks of complex linguistic material does not feed into the process of learning grammar” (Peters, 1985).

The simple frequency of language form used may not be reliable in reflecting language growth, but can we decide whether the child has acquired the abstract grammatical schema (grammatical rules)? According to Tomasello (2000), if children have not acquired the abstract grammatical schema of particular language form, they could only produce that language form in item specific ways, only on specific words and phrases, this shows that children do not have systematically acquired that language form. In later stage of development, children can segment these chunks, they can find formulaic frames of the structure, understand the underlying abstract schema
of that particular form (Peters, 1995). They could produce the language form with various lexical and phrases in unlimited ways and they are productive in the use of that language form. Therefore, productivity will be our second measure of acquisition of functional category in our study.

As this study aims at investigating the functional categories growth, the productivity would measure the generalization of aspect marker $E zo2 as it would emerge earlier than other aspect markers and documented the productivity of functional categories more clear. When children understand the abstract grammatical schemas, they could produce them with more verbs rather than on individual verb specifically. In this study, the verb types attached to the aspect marker $E zo2 would be counted. Also, children acquired the abstract grammatical schema should be able to attached the aspect marker $E zo2 to newly learned verbs, so that it would be expected that children would increase the attachment of aspect marker $E zo2 to the new verb types across time.

The third parameter in measuring growth in the use of functional categories would be the error pattern, as the error pattern reflected the children’s immaturity in understanding of the functional categories, so that tracing the error pattern, it was expected children would show decrease in the agrammatic production or we could see different error pattern at different stage of development. For example, children may overgeneralize the functional categories like 唔食 m4 sik6 zo2 (not ate), and at later stage of development, this error pattern would be reduced as children’s abstract grammatical schema started to form.

Research Questions

1. Is functional category acquisition later or earlier in Cantonese-speaking children
than English speaking children?

2. Does functional category production increase with time?

3. Do children show increased productivity in the use of functional categories with time?

4. Is there individual difference in the development of functional categories?

Methodology

Four Cantonese-speaking children were studied from naturalistic speech sample of the existing longitudinal corpus collected by Lee, Leung and Wong (1996). The conversational speech sample was collected through the interaction between the child, caretakers and the investigator during home visits. The child interacted with the same investigator throughout the study.

The corpus was transcribed and verified by a second transcriber in full using the CHAT transcription system developed by CHILDES (MacWhinney, 1995).

There were a total of 8 subjects with total of 171 data files in the corpus. Four children at lower chronological age (1:11 – 2;01) were selected from the corpus. Five data points at a two-month interval over a total of eight-month period were studied. The second data file of all children was selected from the existing corpus as the first data point in this study. There were two criteria for the choice of the starting data point: (i) the data should provide enough verb phrases for the study. (ii) It would provide a better fit for the 2-month interval.

All the repetitive, agrammatic production and the response to the Yes/No questions were deleted from the sample. For each data point, one hundred verb phrases and the use of aspect marker and post-verbal particles were counted and
further analyzed. The following measurements would be done on the hundred verb phrases extracted.

**Measurement**

In this study, the Mean Length of Utterance (MLU) out of the first one hundred and fifty (intelligible and complete) child utterances generated via KWAL (MacWhinney, 1995) was used as a general index of language growth for these children.

In order to demonstrate the language growth in functional categories (aspect markers and post-verbal particles), the number of aspect markers and post-verbal particles used in the spontaneous speech sample at each data point were measured. In the study, the number of types of aspect marker and post-verbal particles used in the speech sample would be counted also.

The productivity would be a second parameter in demonstrating the functional categories growth, the generalization of aspect markers $\text{z}_2$ attached to different verb types and the number of new verb types attached to the aspect markers $\text{z}_2$ were counted. When children start to develop an abstract grammatical category, they should show increase in the use of the aspect marker $\text{z}_2$ attaching to different verb types instead of on limited verb types. Also, the number of new verb types attached to aspect marker $\text{z}_2$ demonstrates the increased generalization of aspect marker $\text{z}_2$ to new verb types across time.

Also, percentage of spontaneous production of functional categories would be counted as children would show increase in spontaneous production of functional categories. When children produced functional categories, the former two utterances of adult would be traced and to see whether the child would imitatively produce the
functional categories based on the adults’ utterance.

**Coding System**

The aspect markers and post-verbal particles measured in this study were basically based on the classification of Matthews & Yip (1994) as shown in table 1.

<table>
<thead>
<tr>
<th>Types</th>
<th>Aspect Marker</th>
<th>Types</th>
<th>Post-verbal Particles</th>
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</thead>
<tbody>
<tr>
<td>Experiential</td>
<td>gwo3 透</td>
<td>Repetitive</td>
<td>faan1 番 gwo3 透</td>
</tr>
</tbody>
</table>
| Perfective          | zo2 咋       | Resultative | dou2 到, dou3 到, hou2  
| Good                | jyun4 住     | Quantifying | saal3 看, maaib4 埋,  
| Continuous          | jyun4 住     | Adversative | chan1 興     |
| Delimitative        | hah5 哎     |                   | tim1                   |
| Habitual            | hoi1 開     |                   |                       |

However, there was modification of the post-verbal particles classification system. Matthews & Yip (1994) included the directional particles, resultative particles, quantifying particles and the adversative/habitual particles for the post-verbal particles, but for the directional particles and the resultative particles, most of the particles could be used alone as a verb or an adjective which would be counted as lexical items in this study. The classification system in this study would only include the post-verbal particles in Matthews & Yip (1994) which cannot stand alone as a lexical item, or the post-verbal particles that have different meaning when it is used as adjective like 好 hou2, in adjective form, it means “well” but when it is used as post-verbal particles, it means “finished’. Apart from this, for the 番 faan1 and 過 gwo3 which were labeled as directional particle from Matthews & Yip (1994), since
they have the meaning of repetitive, that implies the action need to repeat once like
做過 zou6 gwo3, 做番 zou6 faam1 (which means do it again), not really expressing
the direction of the action and they were labeled as “repetitive” particles in this study.

Reliability

Reliability measurements were carried out in extracting the hundred verb phrases
from the raw data and the categorization of the aspect marker and post-verbal
particles by a second examiner, 10% of the total data file was taken out randomly and
the inter-rater reliability was approximately 92%.

Result

In the following, the study measured these four children in their use of functional
categories – aspect markers and post-verbal particle in two ways. One was viewing
the functional category development of these four children as one group, and the other
examined the functional category development individually. It has been apparent
since the early longitudinal study in Brown (1973) that even in small sample, children
can show very different rate of development.

General Developmental Trend

Figures, 1-2 demonstrated the group mean MLU, the group mean number of
aspect marker (ASP) and post-verbal particles (PVP) used respectively. From the
MLU result, there was a peak in data point 3 (mean age 2;04) and this was due to the
sampling effect which there was a sudden increase in subject CGK. However, from
the group mean MLU, it did reflect a general language growth increased from 2.08 to
2.64 morphemes throughout this eight-month-period.
Also, from the group mean number of aspect marker and post-verbal particle used as shown in figure 2, it did show a gradual increase in the number of aspect marker and post-verbal particle used in the group. The peak in data point 3 (mean age 2;04) in the number of aspect marker used was due to the sampling affect of one subject, CGK, who would be shown in the later part, was a fast developer. However, in general, children would use the aspect marker more than the post-verbal particle at any data point.
As mentioned before, the functional categories growth would be demonstrated by the generalization of aspect marker to verb types across time as shown in figure 3, it showed gradual increase in verb types attached to aspect marker ইউজো২. In figure 4., this showed the increase number of the new verb types attached to the aspect marker ইউজো২ cumulatively.

**Individual Difference**

In the following, the individual differences in the frequency of functional categories used, the productivity measure and the error pattern among these four children would be addressed. The horizontal axis of each figure represented the mean age of four children and the vertical axis represented the number of language form used by these four children measured by different parameters.

**Frequency of functional categories used**

![Frequency of functional categories used](image1)

Figure 5 demonstrated the MLU of each subject individually, the MLU were fluctuating in the data but it did show the increase in MLU in general. It reflected that children’s language competence was increasing throughout these 8-month-period.

Figure 6 reported the individual use of aspect marker, in general, CCC and CGK
deployed the aspect marker in higher frequency than CKT and MHZ. Only CKT demonstrated steady increase in the use of aspect marker while the other three subjects were quite fluctuating.

Figure 7 demonstrated the individual use of post-verbal particle, however, the deployment of the post-verbal particles were similar among the subjects which CGK used more post-verbal particle in the beginning. However, for CCC, CKT and MHZ, they showed increase in their use of the post-verbal particle throughout the study.

In figure 8, it demonstrated the percentage of spontaneous production of aspect marker and post-verbal particles. However, there is no different within the subjects throughout the study but it did show individual difference among the subjects. More spontaneous production of aspect marker and post-verbal particles was found in the speech sample in CCC and CGK than CKT and MHZ.

In table 2, it showed the number of types of aspect marker and post-verbal particles used individually throughout the study. However, number of aspect markers
deployed by the subject was similar throughout the study but CGK used more aspect marker types than the other subject. For the use of post-verbal particles, all children showed increase in the number of types of post-verbal particles used except in CCC, there was a sudden drop in the last data point.

Table 2  Number of types of aspect markers and post-verbal particles used across time

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mean age</th>
<th>2;0</th>
<th>2;02</th>
<th>2;04</th>
<th>2;06</th>
<th>2;08</th>
<th>Aspect marker</th>
<th>2;0</th>
<th>2;02</th>
<th>2;04</th>
<th>2;06</th>
<th>2;08</th>
<th>Post-verbal particles</th>
</tr>
</thead>
<tbody>
<tr>
<td>CCC</td>
<td>2;0</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CGK</td>
<td>2;02</td>
<td>4</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>CKT</td>
<td>2;04</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>MHZ</td>
<td>2;06</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Productivity Measures

![Figure 9](image1.png)  Number of verb types attached to ASP zo2

![Figure 10](image2.png)  Number of new verb types attached to aspect marker zo2

Productivity would be measured by the verb types attached and the new verb types attached to aspect marker zo2 as shown in figures 9 and 10 respectively. In figure 9, children’s performance was inconsistently throughout the study, and only
CGK and CKT could demonstrate increase in the number of verb types attached to aspect marker 丸 zo2.

In figure 10, it demonstrated that children would attach the aspect marker 丸 zo2 to new lexical verb across time. However, although there was not consistent increasing pattern in the attachment of new verb types with aspect markers, children were able to attach the new verb with aspect marker for each data point except the last data point of MHZ. CKT demonstrated steady increase in the number of new verb types attached to the aspect marker 丸 zo2 which demonstrated the generalization of functional categories.

Error Pattern in Functional Categories

Table 3 showed the error production of functional categories of CCC, CKT and MHZ. However, there was not error production found in CGK’s spontaneous speech sample. The error production were mainly the misplacement of the negation 唔 m4 with the post-verbal particles, the production of aspect marker 丸 zo2 with negation 末 mei5 which only appeared once in MHZ’s speech sample.

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Error production of CCC, CKT and MHZ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age</td>
<td>2;00</td>
</tr>
<tr>
<td>CCC</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>CKT</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>MHZ</td>
<td>-</td>
</tr>
</tbody>
</table>
Discussion

In the following, we would discuss the research questions stated in the introduction, (i) Does functional category production increase with time? (ii) Whether Cantonese-speaking children will acquire the functional categories – aspect markers and post-verbal particles earlier than the English-speaking children? (iii) Do children show increased productivity in the use of functional categories with time? (iv) Is there individual difference in the development of functional categories?

Functional Categories Development and Language Development

Functional categories growth in Cantonese-speaking children is evidenced by (i) the increase in frequency and types of functional categories used. (ii) Productivity measure. (iii) Error pattern of functional categories in children.

Increase in frequency and types of functional categories used. From figure 1, the group mean showed that children increased the use of both aspect marker and post-verbal particles across times and suggested that their ability in using the functional categories (aspect markers and post-verbal particles) increases with the MLU. Supporting evidence was also available in the individual data, each child used more aspect marker and post-verbal particles in the last data point than that in the initial data point. These results matched with the expected result from the English-speaking children as proposed by Radford (1990), both Cantonese and English-speaking children will increase their use of the verb inflections in the later stage of development.

Table 2 demonstrated children’s increase in the types of aspect marker and post-verbal particles used. This supported Radford’s (1990) view that functional categories are emerged and to become more adult-like, so that children would use
more and more functional categories as adult do.

**Productivity.** From figures 3-4, children showed increase in number of verb types and number of new verb types attached to the aspect marker ฉือzo2. This implied that children's abstract grammatical schemas of functional categories were developing, both semantically and syntactically, so that they could generalize the use of functional categories to other verbs based on the abstract grammatical schemas and to other newly learned verbs in the later stage of development. From the increase in both verb types and new verb types attached to aspect marker, this proved that children were not using functional categories with individual verbs in item specific way which they had passed through the earlier stage mentioned in Tomasello (2000).

However, it is interesting that both Radford (1990) and Tomasello (2000) have mentioned the timing of functional categories started to acquire. Radford (1990) stated that children develop functional categories after lexical categories, but they still develop the abstract schemas for functional categories during the third year of life, during which time these functional categories become productive gradually. From Tomasello (2000), up to age of about three, children do not have abstract schemas and productive functional categories. They can only use individual forms with individual verbs specifically, and the formulation of functional categories (of past tense, of aspect marker and post-verbal particles) come later. As from the result, this suggested that children become more and more productive to the use of the functional categories in this eight-month-period, age 2;00 to 2;08, so that children had started developing the abstract grammatical schema before age 3. This supports the view of Radford (1990) that children would start to develop the schema during third year of life.

**Error Pattern of the functional categories.** In the speech sample, four children
were able to produce both the aspect marker and the post-verbal particles appropriately for most of the time, they could produce the aspect marker and post-verbal particle with appropriate action semantics, and they could produce them in correct position which should follow the verb. However, it was noted that in only one trial, MHZ produced the verb with negation 唔 m4 with aspect marker 咚 zo2 which is inappropriate in Cantonese. Also, it was noted that in the speech sample of CCC, CKT and MHZ, they inconsistently produced the form of the post-verbal particles with negation inappropriately like 食唔倒 sik6 m4 dou2 (correct) and 唔食倒 m4 sik6 dou2 (incorrect) throughout the eight-month-period (as shown in table. 3) and they could produce them appropriately in sometimes.

The possible reasons for the error production are: firstly, children could not syntactically analyze the verb with functional categories like 輸咗 syul zo2 (lost) in the agrammatic production of 未輸咗 mei6 syul zo2 (not lost), they just treated 輸咗 syul zo2 (lost) as a chunk without analyzed morphologically, this showed that they are not fully productive in the use of aspect marker and post-verbal particles. And the abstract grammatical schemas of functional categories were still emerging.

Secondly, it might be due to the negation 唔 m4 used with the post-verbal particles should be placed between the verb and the post-verbal particles like 做唔讀 zou6 m4 saxi3 (not finished), 拎唔倒 lingl m4 dou2 (cannot take) which is different from the negation of the verb like 唔食 m4 sik2 (not eat), 唔做 m4 zou6 (not do). As in the negation of verb, it just simply adds the negation of the 唔 m4 in front the verb, however, in the verb with post-verbal particles, the negation 唔 m4 should be placed between the verb and post-verbal particles which may be unusual in the early developing children. Therefore, they overgeneralized the use of negation of 唔 m4 to
the verb with post-verbal particles.

It was noted that children was able to produce the negation with 未 mei6 all correct in four children, as using 未 mei6 for negation with post-verbal particle, it just simply put the negation in front of the verb and the post-verbal particle like 未做嘅 mei6 zou6 saai3 (not finish). So that it is expected that these children can produce the negation with 未 mei6 correctly but not for 唔 m4 as it is more complex syntactically.

However, as they could produce the post-verbal particle with negation 唔 m4 inconsistently throughout the study, as according to the Radford (1995), we could conclude such inconsistent pattern as the transition phrases in language development, that means such syntactic structure is under development. In parameterization theory (Chomsky, 1989), it stated that the functional categories acquired later as it requires linguistics experiences before they can form the underlying grammar of the functional categories. Therefore, it is believed that children would produce the correct negation form with 唔 m4 in the later development through linguistic experiences of the functional categories. However, in the spontaneous speech sample of CGK, she could produce all the negation of the verb with post-verbal particles correctly and thus she had gone through the transition phases, so CGK's use of the functional category was more advanced than the other three children.

To conclude, the development of functional category in Cantonese-speaking children is supported by the evidence that the use of the functional category increased with the MLU growth, the generalization of the aspect marker 喺 zo2 to other different verbs and the transition phases of the development of the negation 唔 m4 in children.
Earlier Emergence of Functional Categories in Cantonese-Speaking Children

As stated before, in English speaking children, functional category likes the verb inflections will appear in the child language after age two (Radford, 1990). However, it was noted that all four children were able to use the functional category at age 1;11 or before. Especially in CGK's spontaneous speech sample, CGK was able to use the functional category with both aspect marker and post-verbal particles in 32% of verb phrases counted. So, it is believed that the aspect marker and the post-verbal particles emerged before age 2 in Cantonese-speaking children, which is earlier than the verb inflection emergence in English-speaking children. Would it be possible that the verb-inflections system in English is more complex than that in Cantonese? As aspect marker and post-verbal particles are used which reflect children's internal viewpoint on the aspect of that action, there is no tense agreement and subject agreement in the use of aspect marker and post-verbal particles in Cantonese which made it more simple. So, Cantonese-speaking children can acquire the functional categories easier and earlier than English-speaking children.

Apart from this, the earlier emergence of the functional category in Cantonese-speaking children may be related to the identifiability, that means the verb inflections in English is more difficult to be identified as they are usually unstressed or non-syllabic consonant with phonological salient in feature. However, in Cantonese, all the aspect marker and post-verbal particles are syllable in nature, sharing the same phonological saliency as lexical items (Lee, 2000). So it is possible that Cantonese-speaking children can identify the functional category easier and earlier than the English-speaking children.
Development of Aspect Markers and Post-Verbal Particles

Also, from the speech sample of the children, we could observe the developmental pattern of each of the aspect marker. In the speech sample, the most frequently appeared aspect markers are the 咅zo2 and зыва6 住, and the later is the 甘2 繁. Also, the aspect marker 咅zo2 and zza6 住 appeared earlier in CCC, MHZ and CKT, they started to use the aspect marker 咅zo2 and zza6 住 from age 2 and similar finding was noted that aspect marker 咅zo2 was first encoded and the stative marker zza6 住 in Cantonese emerged before the progressive marker 甘2 繁. and these aspect markers 咅zo2, 甘2 繁 and zza6 住 emerge before age 2;06 (Chan, 2000). However, from the speech sample of CGK, she could use 4 different aspect markers as age 1;11 and throughout the study while the other were able to use one two types of aspect marker, it is believed that CGK is more advanced in the development of the aspect marker.

For the post-verbal particles, from the spontaneous speech samples, the post-verbal particles saai3 嘢, dou2 嘢, jyun4 完 were appeared in most of the children’s spontaneous speech sample at about age 2;0. For the other post-verbal particles, there is no systemic pattern shown from the speech sample.

However, from the results, it was noted that children could able to produce the post-verbal particles denote the meaning of completion, or successful accomplishment of an action and the perfective aspect marker 咅zo2 earlier than the other aspect markers and post-verbal particles, it is believed that the functional categories denoting the meaning of completion of action would develop first.

Individual Difference in the Use of Functional Categories

Individual difference is found in the development of functional categories among
children as shown in the results of various measures individually throughout the study.

Obviously, CGK was the most advanced in the development of functional category than other three children, as CGK used the aspect marker and post-verbal particles more than the others and more types of functional categories were used. Also, CGK was more productive in the use of functional categories as she could use more different verb types attached with aspect marker $\text{Je zo2}$ than the other children and she could attached the aspect marker $\text{Je zo2}$ to more new verbs and most of the production of functional categories were spontaneous production. No error production was found in CGK's use of functional categories. All these suggested that CGK was more advanced in the development of the functional categories.

For the other three children, they were less productive in the use of the functional categories and lower deployment was found. However, CKT is the best example in documenting the development of functional categories growth among four children. As in figure 5, it showed that the MLU of CKT was increasing with the increase in the use of both functional categories of aspect markers and post-verbal particles. This suggested that the MLU grows with the increased use of functional categories. Also, in terms of productivity of the functional category, CKT showed steady increased in the number of verbs types attached to aspect marker $\text{Je zo2}$, which means that she could realize the underlying grammar of the aspect marker steadily and become productive to the new verb learnt. She could also attach the functional categories to new very types as supported by the fact that from figure 10, CKT showed increased in number of new verb types attached to aspect marker $\text{Je zo2}$.

For MHZ, the use of functional categories was different from the other three children as the growth in the use of aspect markers was not obvious throughout there
eight-month-period however, his use of post-verbal particles increased and showed steady growth in this study. This may be due to the fact that verbal particles such as resultative particles 倒 dou2 完 jyun4 好 hou2 and the quantifying particles 說 saai3, which denotes the meaning of completion, or successful accomplishment of an action, which can be an alternative to perfective aspect marker 呢 zo2. This was supported by the spontaneous speech sample of MHZ, he used the post-verbal particles like 倒 dou2, 完 jyun4, 好 hou2 and 說 saai3 more than the aspect marker zo2. From the verb semantics of the verb attached to the post-verbal particles, the verbs used by MHZ could be attached to both aspect marker and post-verbal particles and MHZ showed higher preference in choosing the post-verbal particles. This pattern is different from the other three children and this might explain the low deployment rate of the aspect markers and low productivity in MHZ. Also, he was a slower developer than the other three children as he slowed lower percentage of spontaneous production of functional categories shown in figure 8.

Individual difference was found in the deployment rate, the productivity and the error pattern in the use of the functional categories among children.

Limitations

The present study was only a small-scale cross sectional study which only four subjects were included, so that it might not reveal a full picture of the developmental progression in terms of the aspect marker and post-verbal particles.

In the study, the spontaneous speech sample was analyzed starting from age two, however, it was found that children had started to use the aspect marker and post-verbal particles, even in some subjects, they were able to deploy the functional categories in quite advanced level. So that it would be better to start at age 1;06 which
the developmental trend of functional categories would be shown more clearly.

**Clinical Implication**

From the result, children show individual difference in the development of aspect marker and post-verbal particles from age 2;00 to 2;08 but all children show the emergence of functional categories at age 2;0, this can be the developmental trends of functional categories. However, children may produce the error in the position of negation 㖟 m4 with the verb with post-verbal particles which should be normal and acceptable in children aged from 2;00 to 3;00 as it would be the transition phrases in language development.

**Further Study**

As the use of verb inflections can be used as a clinical markers for English-speaking children with Specific Language Impairment (SLI), so that the further study can compare the use of aspect markers and post-verbal particles in normal developing children and children with SLI.

**Conclusion**

The present study supports there will be growth in the use of functional categories and this was evidenced by the increase in the use of aspect marker and post-verbal particles, and the productivity of the aspect markers which children could attach the aspect marker to more different verb across time and the transition phases of the error pattern in functional categories. Furthermore, individual difference in functional category development was found in Cantonese-speaking children.
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