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Syntactic awareness of Cantonese-speaking children*

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ABSTRACT

The development of metalinguistic awareness, and specifically syntactic awareness, (here measured by age-related changes in the ability to judge and revise unacceptable sentences), reflects developmental changes in focus from semantic to syntactic properties of sentences. Previous research reported that children find judgements of word-order changes easier than morphological violations (Hakes, 1980). We hypothesized that this difference in ease of judgement is linked to the language under investigation. That is, there may be a relationship between the functional load of grammatical morphemes and ability to detect syntactic violations. This study investigated the development of syntactic awareness in Cantonese-speaking children. Fifty-six subjects from four age groups (three, five, seven and 20 years old) were asked to judge the grammaticality of 40 sentences (18 with word-order changes and 22 with morphological violations) and correct the grammatically deviant sentences. There was a significant age effect on subjects' performance in both judgement and revision tasks. Children scored significantly higher in judging sentences with word order changes than those with morphological violations. They also scored higher on word order revisions than morphological revisions, an unexpected finding. The success of correcting morphological violations varied by morphological marker, apparently according to each marker's degree of obligatory use in the

language. It would seem then that syntactic awareness is very much affected by language-specific characteristics.

INTRODUCTION

Metalinguistics is a relatively recently developed psycholinguistic tradition. Romaine (1999: 272) refers to metalinguistic abiliity as the ability to 'step back, so to speak, from the comprehension or production of language to analyse its form'. In other words, metalinguistic ability is the ability to reflect consciously upon the nature and properties of language (Van Kleeck, 1982). There are four general types of metalinguistic awareness – phonological (metaphonological), lexical/semantic (metalexical/metasemantic), syntactic/ structural (metasyntactic) and pragmatic (metapragmatic) awareness and each of these has been investigated to some degree as a developmental phenomenon. The development of metalinguistic awareness, and specifically syntactic awareness, (as measured by age-related changes in the ability to judge and revise unacceptable sentences), reflects developmental changes in focus from semantic to syntactic properties of sentences. Previous research reported that children find judgements of word-order changes easier than morphological violations (Hakes, 1980). We hypothesized that this difference in ease of judgement is linked to the language under investigation. That is, there may be a relationship between the functional load of grammatical morphemes and ability to detect syntactic violations.

Development of metalinguistic skills

Development of these types of skills has been studied extensively for English, namely, phonological awareness (e.g. Nesdale, Herriman & Tunmer, 1984), word awareness (e.g. Karmiloff-Smith, Grant, Sims, Jones & Cuckle, 1996), syntactic awareness (e.g. Sutter & Johnson, 1990) and pragmatic awareness (e.g. Pratt & Nesdale, 1984). There have been studies of metalinguistic awareness in other languages, for example Kannada (Karanth, Kudva & Vijayan, 1995), Portuguese (Flores, 1995), Kond (Dash & Mishra, 1992), Japanese (Nakamura, 1997), French (e.g. Bialystok, 1986), Swedish (Ostern, 1991), and Italian (e.g. Rossi & Pontecorvo, 1989). These studies explored various aspect of development, for example some studies focused on the effects of bilingualism (e.g. Bialystok, 1986; Ostern, 1991; Dash & Mishra, 1993), or schooling (e.g. Bialystok, 1986; Rossi & Pontecorvo, 1989; Karanth *et al.*, 1995) on metalinguistic skills. Other studies were limited in scope, for example Nakamura (1997) explored gender markers in Japanese and Flores (1995) studied metapragmatic awareness in Portuguese.

There have been few studies of the metalinguistic skills of children speaking South-East Asian languages and these have mostly been limited to metaphonology. Several recent studies investigated phonological awareness

of both normal and language-disordered Cantonese-speaking children (e.g. Woo, 1993; Kam, 1996; Wong, 1997) but there have been few studies on other metalinguistic skills. Wong (1997) examined the relationship between phonological awareness and linguistic proficiency of Cantonese-speaking children and reported high correlations between metaphonological tasks and language production. Chan (1993) investigated the development of explicit word order knowledge (metasyntactic knowledge) and described a pattern of emergence of such knowledge (see below). Although all of the above studies showed that metalinguistic awareness improved with age, little is known about how language-specific features affect such growth. The area of language form would seem to hold the most promise for investigation of cross-language differences in metalinguistic development, as syntax and morphology vary markedly across languages. Therefore a fruitful area for investigation should be that of metasyntactic awareness.

Metasyntactic ability

Syntactic awareness is 'the ability to reason consciously about the syntactic aspects of language, and to exercise intentional control over the application of grammatical rules' (Gombert, 1992: 39). To date we know that English-speaking children show a steady growth in metasyntactic ability with increasing age, and with exposure to literacy (e.g. Hakes, 1980). We also know that changes in the ability to JUDGE and REVISE unacceptable sentences reflects changes in attendance from semantic to syntactic properties of sentences (e.g. Hakes, 1980). English-speaking children find JUDGEMENTS of word-order violations easier than morphological violations. However, Pratt, Tunmer & Bowey (1984) found that English-speaking children found morphological REVISIONS easier than word-order revisions and attribute this result to the great effort required to re-organize words in a sentence, as opposed to finding and correcting incorrect mophological markers. It is possible that this difference in ease of judgement and ease of revision is linked to the language under investigation. Firstly, if a morphological marker carries substantial semantic weight (a heavy functional load) in a language, then one would suppose that violation of the marker in question would be detected very easily, possibly on semantic rather than syntactic grounds. It is possible also that if morphological markers are separate morphemes and carry stress equal to all other lexemes, then they may be more easily detected in an error form. Secondly, acceptable variations in word order within a language may lend themselves to easier revision. Exploration of a language that differs from English (the most-studied language) on significant syntactic characteristics may shed light on the development of metasyntactic abilities in children. One such language is Cantonese.

Given the syntactic characteristics of Cantonese, it is possible to make predictions based on findings from English. Specifically, similar to English,

it is expected that Cantonese-speaking children may find word order JUDGEMENTS easier than morphological judgements, for two reasons. Firstly, word order is an important feature of Chinese to the extent that Chang (1992: 279) commented that 'word-order is the single most important syntactic device for sentence interpretation'. Secondly whereas other languages, for example English, carry subject–verb agreement and obligatory inflectional markers of tense, plurality, and modality, Chinese does not. Verb modifiers are marked in Chinese by independent morphemes, which may be omitted in some cases, dependent on context (for example in the case of aspect markers and copulas). It seems that morphological markers may play a less salient role in sentence interpretation for Chinese-speaking children than for children whose language is morphologically richer. Therefore, Cantonese-speaking children, unlike English speakers, may NOT find morphological revisions easier than word order revisions. The first aim of the present study was to examine the development of syntactic awareness of Cantonese-speaking children and to determine whether there are differences in the growth of syntactic and morphological awareness. A brief outline of Cantonese syntax is required here to underpin later discussion of metasyntactic ability.

Syntactic differences between Cantonese and English

There are several syntactic differences between Cantonese and English: the former is an isolating language while the latter is an inflectional language (Erbaugh, 1992). According to Cheung (1972, cited in Ng, 1994), the relationship between words is marked by word order and free-standing morphemes in Cantonese. Comparing the syntactic structure of the two languages, Matthews & Yip (1994) state that like English, word order in Cantonese is relatively fixed: Cantonese relies heavily on word order to express grammatical relations such as subject and object. Nevertheless, at the same time, the freedom of word order is greater than that in English: a departure from the predominant SV(O) word order such as OSV or VS is allowed in Cantonese. Such variations on word order occur in certain conditions, such as in topicalization (OSV), for example,[1]

1. ni_1 di_1 je_2 ngo_5 m_4'sik_1 ge_3
   this   stuff I   don't know   particle
   I don't know this stuff

or where the main verb is ergative (VS) for example,

2. ni_1 di_1 dit_3-gwo_3 ngo_5 ge_3 zai_2
   here   fell   my   son
   my son always falls down here

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[1] The numerals in romanized forms represent tone (higher = 1, lowest = 6); 1 = high level, 2 = high rising, 3 = mid level, 4 = low falling, 5 = low rising, 6 = low level.

or where the sentence encodes a change in location or state, for example

3. ngo$_6$ sei$_2$ keoi$_5$ la
    hunger die her   particle
    she is starving

Previous research has suggested that SVO word order has a significant impact on children's early word combinations (for example Chang's study of developmental Mandarin, 1992) as well as children's awareness of word order rules. Chan (1993) studied five- and eight-year-old children's awareness of word order rules in Cantonese through grammaticality judgement and correction tasks. Results of the revision data suggested the pattern of emergence of word order knowledge: SVO > SAV > AVO, (where 'A' indicates adverbial) with the eight-year-olds outperforming the five-year-olds on both judgement and revision tasks. The five-year-olds used a semantic revision strategy whereas the eight-year-olds predominantly used a grammatical strategy.

With regard to word structure, English is also somewhat dissimilar to Cantonese. In English, grammatical morphemes like tense and plural markers are affixed to lexical categories like verbs and nouns to mark grammatical distinctions (Erbaugh, 1992). In Cantonese, grammatical morphemes are attached to lexical categories, without changing the root of the word to mark semantic relations (Matthews & Yip, 1994). Here we briefly outline the types of morphemes investigated in this study: classifiers, aspect markers, negative *mou*$_5$, the copula verb *hai*$_6$ and the coverb *hai*$_2$. These markers were chosen as they are the most closely aligned with comparable forms in English: noun premodifiers and verb pre- and post-modifiers. A detailed discussion of these morphemes for Cantonese is provided by Matthews & Yip (1994), and Chang (1992) and Packard (1993) provide some discussion of Mandarin.

Classifiers are important elements in the syntax of nouns in Cantonese (Matthews & Yip, 1994). There are two types of classifier, mensural and sortal. Measure classifiers denote quantity. Every count noun in the language carries a sortal classifier that denotes perceptual (such as length, shape or size) or functional (such as 'for transport') features of the noun. Classifiers are obligatory in Cantonese under certain syntactic conditions, such as following a quantifier, and in certain pragmatic conditions, such as indicating a particular object among many. The placement of the classifier in the noun phrase is illustrated by Matthews & Yip (1994: 88) as demonstrative – numeral – classifier – adjective – (*ge*) – noun where ge is a linking particle. The construction may simply be a classifier+noun (a numeral is not obligatory) and occasionally just the noun is used. The classifier is obligatory when a demonstrative or numeral is used. Please note that the examples are illustrated by three levels: romanisation of the Chinese productions, a word-

707

by-word translation, and an English gloss of the utterance. Examples of the structure are

4. jat$_1$ thing toi$_2$
    one   CL   table
    a table
5. zi$_1$ bat$_1$
    Cl   pen
    a pen
6. loeng$_5$ zek$_3$ gau$_2$
    two   Cl   dog
    two dogs
7. Question:
    mat$_1$ je$_2$ a$_3$?
    What   thing particle
    what is that?
    Answer:
    lei$_2$
    pear

Recently, developmental studies have shown that a core set of eleven nominal classifiers begins to emerge in children before age two (Lee, Wong, Leung, Man, Cheung, Szeto & Wong, 1996). Substitution and omission errors were reported in the course of development. However omission errors are very rare, as children usually recognise the syntactic requirement for insertion of a classifier, and will use the default generic classifier *goh*$_3$ if the correct classifier is not known (Stokes & So, 1997).

Aspect markers (AM) in Chinese indicate various temporal dimensions of the action denoted by the verbs they follow (Matthews & Yip, 1994), and in Cantonese they are optional with their use being dependent on the speaker's perspective and the discourse context. These grammatical morphemes act as a suffix to the verb and are referred to as bound morphemes (Packard, 1993) such that within transcription systems, the aspect marker is attached to the verb with a hyphen. For example, a verb phrase is commonly transcribed as:

8. Sik$_6$-zo$_2$ faan$_6$
    Eat-AM meal
    have finished meal

The perfective marker *zo*$_2$, the durative marker *zyu*$_1$, and the progressive marker *gan*$_2$ develop in children at around two years of age (Lee *et al.*, 1996). Erroneous use of the perfective marker to encode experiential aspect was noted in a developmental study (Matthews, 1990; cited in Lee, 1996). The optionality of aspect markers qua grammaticality can be illustrated in the

following two sentences, each of which would, in citation form, be acceptable to a native-speaker:

9. Keoi$_5$ gong$_2$-gan$_2$ din$_6$waa$_2$
    She talk-AM telephone
    She is talking on the telephone
10. Keoi$_5$ gong$_2$ din$_6$waa$_2$
    She talk telephone
    She is talking on the telephone

The contexts under which aspect markers are obligatory is not well-understood, but Matthews & Yip (1994: 220) provide some insight in their claim that the perfective zo_2 is obligatory 'where the verb has a quantified object and refers to the past' for example

11. Ngo$_5$ kam$_4$maan$_5$ se$_2$-zo$_2$ loeng$_5$ fung$_1$ soen$_3$
    I last-night write-AM two CL letters
    Last night I wrote two letters

At this uncertain stage in our understanding, we have limited our exploration of aspect markers to omission of the perfective (zo_2) and substitution of the progressive (gan_2).

Negative markers act to negate a lexeme or a sentence. A negative lexeme can have a different meaning to its routine counterpart. For example 'gin_3' means 'see' but '$m_4'gin_3$' means 'lose' (Matthews & Yip, 1994). Here we focus on sentential negation. The four early developmental negative forms in Cantonese are /mou$_5$/, /m$_4$/, /mai$_2$, mai$_5$, mai$_6$/ and /mei$_6$/. These four markers have unique semantic functions in Cantonese. For example, /mou$_5$/ is the opposite word of /jau$_5$/ ('have'), it means 'have not' or nonexistence. The form /m$_4$/ means 'not' and expresses denial, such as not good (m$_4$hou$_2$), or not beautiful (m$_4$leng$_3$) and also forms a negative sentence in the A-not-A form, for example

12. Lei$_5$ sik$_1$-m$_4$-sik$_1$ zoeng$_1$ saang$_1$
    You know-not-know Cheung Mr?
    Do you know Mr Cheung?

The form /mai/ can carry three different tones, 2, 5 or 6, all of which act as negation but carry two different meanings. When /mai/ is pronounced as tone 2 or 5, it carries an imperative meaning, 'don't' for example

13. mai$_5$ gong$_2$ gam$_3$ faai$_3$
    Don't talk so fast
    Don't talk so fast

In fluent connected speech, the sentence form that takes $hai_6m_4hai_6$ is reduced to mai_6 as is shown in the question:

14. $Keoi_5$ hai_6mhai_6 lei_5 ge_3 $taai_3taai_2$
    She   be-not-be your   wife
    Is she your wife?

The last form /mei_6/ means 'not yet' for example

15. Ngo_5 dei_6 mei_6 gin_3 $zoeng_1$ $saang_1$
    We   not yet see   Cheung Mr
    We haven't seen Mr Cheung yet

A recent report of the development of negation in Cantonese (Tam & Stokes, 2001) showed that negation develops early in Cantonese, and that errors in negative use are rare developmentally. In this study we investigate children's knowledge of the forms mou_5 for 'have not' and m_4 for denial.

The copula verb hai_6 is used to join two noun phrases. Its form is invariant and expresses the English equivalents of 'is, are, am' and 'were' (Matthews & Yip, 1994). The copula hai_6 may be omitted (with no loss of grammatical acceptability) expect where emphasis or validity of a claim is at stake (such as in announcing the role/job of a person). In our examples we limited the copula to descriptions of status (he is my friend – $keoi_5$ hai_6 ngo_5 ge_3 $pang_4jau_5$). In Cantonese 'hai_6' is ungrammatical in adjectival sentences, such as 'she is beautiful' ($keoi_5$ $leng_3$ – she beautiful). As yet, we have no data on the development or misuse of copulas in Cantonese.

Cantonese coverbs may be seen as analogous to English prepositions but they also resemble serial verbs in Cantonese in that they co-occur with a lexical verb to modify the verb. In addition, most them have their own meanings as lexical verbs.

The coverb hai_2 acts to mark location, for example

16. Go_4go_1 hai_2 hok_6haau_6
    Elder brother at   school
    Elder brother is at school

It also acts as a localizer, in other words a general-purpose marker of location. It usually occurs with a noun phrase followed by a localizer for example

17. Ze_4ze_1 hai_2 ce_1ce_1 jap_6bin_6
    Elder sister at   car   inside
    Elder sister is in the car

Here we test children's knowledge of the localizer form of hai_2. As with copulas, we have no data on the development or misuse of coverbs in Cantonese.

Having outlined the syntactic characteristics of Cantonese, we now return to the premises under investigation. Recall the claims that (a) changes in the ability to judge and revise unacceptable sentences reflect changes in focus

from semantic to syntactic properties of sentences (e.g. Hakes, 1980), and (b) children find judgements of word-order changes easier than morphological violations (Hakes, 1980). Further, we suggested that this difference in ease of judgement is linked to the language under investigation. That is, there may be a relationship between the functional load of grammatical morphemes and ability to detect syntactic violations.

These claims reflect an underlying belief that early in development children attune to the semantics of input, rather than the syntax, and that this reflects a cognitive stage of development wherein language learning is the focus, rather than language analysis. Only later in development, once language production and comprehension becomes more automatic (and more adultlike) does the child develop the cognitive abilities required to reflect on language. While the description of metalinguistic ability is useful in its own right, 'ultimately, descriptions of metalinguistic ability must be reconciled with current conceptions of development' (Bialystok, 1986: 509). Therefore, the development of metalinguistic ability in Cantonese-speaking children is explored within a framework of cognitive development (Gombert 1992).

Development of syntactic awareness

Based on the cognitive phase model proposed by Karmiloff-Smith (1986), Gombert (1992) postulates a model with four successive phases to explain children's metalinguistic development. His cognitive phase model was employed in this study to account for children's development of syntactic awareness, an aspect of metalinguistic development. The following is a summary of his ideas (Gombert, 1992: 189–191):

The acquisition of early linguistic skills. The first phase is obligatory in character, that is, it is attributable to normal maturational processes. A child's earliest linguistic skills are fundamentally established on the adults' model. A particular linguistic form and its pragmatic context in which the form has been positively reinforced will be stored in memory. The child's use of a linguistic form is similar to that of adults at the end of this phase. This is the beginning level of automation of linguistic behaviour. The increased length and complexity of adult models and the length of the child's own productions will trigger the next phase. It would seem from Gombert's description that children in this phase will be aged about two years, or at the onset of two word combinations.

The acquisition of epilinguistic (episyntactic) control. The second phase is also obligatory and involves an organisation of the knowledge gained in the first phase. In this phase, there is not just an internal organization of the acquired knowledge but also the creation of links. These links are associations of prior knowledge with new knowledge regarding the same linguistic forms or forms

that are related to those in the course of being organized. The new knowledge acquired is attributed to the child's active linguistic processing, leading to an 'unreflected awareness of a system' (Gombert, 1992: 189). Although no age is attached to this stage, Gombert states that this stage coincides with the emergence of syntax (one could suppose about three years of age).

The acquisition of metalinguistic (metasyntactic) awareness. The third phase is nonobligatory in nature as it is not decided by maturational factors but external factors, such as reading and writing (that necessitate the conscious control of many aspects of language), to bring stable epilinguistic (epi-syntactic) control to consciousness. This stage is thought to develop around five years of age.

The automation of metaprocesses. Metaprocesses are 'cognitive processes which are accessible to the consciousness' (Gombert, 1992: 13). Those metalinguistic (metasyntactic) functions whose use has been frequently effective become automated. This highest stage occurs around the ages of six and seven, when the child has had some school experience.

In summary, phase 1 (the acquisition of early linguistic skills) is the stage of early language acquisition, which does not involve a component of reflection. Phase 2 (the acquisition of epilinguistic (episyntactic) control) also does not involve a component of reflection, but is the stage of early syntactic combinations, occurring around three years of age. Reflection should commence in phase 3 (the acquisition of metalinguistic (metasyntactic) awareness) at around five years of age, and consolidate in phase 4 (the automation of metaprocesses) around six or seven years of age. However, the study of when metalinguistic abilities develop is constrained by the meth-odology employed in investigations. As noted above, all previous research found that metasyntactic ability increased with age. However, to our knowledge, previous research has not systematically explored metalinguistic development (in pre-school and school-aged children) in languages other than English through the use of two widely used paradigms for the study of English: grammaticality judgement and revision abilities.

Tasks measuring metasyntactic ability
Previous studies on syntactic awareness encompassed children's awareness of sentence-grammaticality, structural synonymy and structural ambiguity. More studies have been done to tap young children's abilities to reflect on syntactic forms using grammaticality judgement tasks. Researchers used either a grammaticality judgement task (e.g. Gleitman, Gleitman & Shipley, 1972) or a revision task (e.g. Pratt *et al.*, 1984) or both tasks (Hakes, 1980; Smith & Tager-Flusberg, 1982; Sutter & Johnson, 1990) to assess children's awareness of different syntactic constructions. In a judgement task, the

subject is presented with both grammatical and ungrammatical sentences. He/she is required to indicate which are grammatical and which are ungrammatical. In a revision task, the subject is presented with only ungrammatical sentences and is required to correct them. Cross-study comparisons on these tasks are difficult due to methodological differences.

Different researchers used different tasks to tap different aged children's awareness of different types of syntactic constructions and different procedures were adopted in different studies. Despite the large variability across studies, most findings show syntactic awareness improves with age and all tasks are effective in assessing metasyntactic awareness. Furthermore, it appears that children performed better on judgement tasks than on revision tasks. Owing to the possibility of a response bias in judgement tasks, a revision task was thought to be a more sensitive measure of syntactic awareness (Pratt *et al.*, 1984). While Hakes (1980) reported that children found JUDGEMENT of sentence acceptability in stimuli with word-order changes easier than those with morphological violations, Pratt *et al.* (1984) found that children performed better on morphological REVISIONS than word-order revisions. Therefore, the second aim of this study was to examine the effectiveness of the experimental tasks in evaluating the growth of syntactic awareness in a language other than English.

To summarise, this study had two aims: (a) to examine the development of syntactic awareness of Cantonese-speaking children and (b) to determine the relative ease of judgement and revision of word order and morphological violations. Based on prior research, we predicted that (a) children's syntactic awareness would improve with age. Given the specific syntactic features of Cantonese, we also predicted that (b) metasyntactic skills of Cantonese-speaking children would differ from English-speaking children, that is, Cantonese-speaking children should find both word-order judgements and word-order revisions easier than morphological judgements and morphological revisions.

METHOD

Subjects

A total of 68 subjects, who were all native speakers of Cantonese, participated in the study. Eighteen three-year-old and 19 five-year-old children were randomly selected from a kindergarten in Kowloon and another in the New Territories. Seventeen seven-year-old children were recruited from a primary school on Hong Kong Island. These child subjects were all free of hearing and visual impairments, according to teachers' reports and school-entry screening. Fourteen university students, who had no prior knowledge of linguistics, volunteered to form an adult control group in the study. The inclusion of an adult group was to test the extent to which the syntactic

713

TABLE 1. *Summary information of the participants*

Age group	Mean age	S.D. (in months)	N
3	3;6	3·43	14
5	5;4	2·74	14
7	7;3	2·59	14
Adult	20;7	16·81	14

awareness tasks reflected grammatical knowledge (McDaniel & Cairns, 1996). (See Table 1.) Child subjects had to meet performance standards based on the results of exclusion tests. Six subjects were excluded from the study due to inability to meet the standard (see the last section of the method).

Stimuli

The syntactic awareness tasks were designed to test subjects' abilities to judge the correctness of sentences and to revise ungrammatical sentences. Two sets of items were formulated – Set A for a word order condition and Set B for a morphological violation condition. There were 22 sentences (18 test items and 4 practice items) in the word order condition while 27 sentences were devised (22 test items and five practice items) for the morphological violation condition. The types of sentences in which the morphological markers occurred, and the exact morphological markers were in part determined by the degree of optionality of each marker (see the introduction). For each item, a line-drawn picture was used as a prop to depict the sentence.

Two principles guided the construction of stimuli: (a) Since the aim of the study was to assess subjects' syntactic awareness instead of comprehension, all syntactic structures and vocabulary items should be comprehended by all subjects, even for the youngest age group and (b) the length of the sentences should be controlled to minimise the memory load for the subjects. Therefore, most test sentences were of 3-element syntactic constructions, which were generally comprehended by children from thirty-six months based on Cheung's (1993) study of Cantonese-speaking children's comprehension. The vocabulary items were selected from Chinese books used in kindergartens, the Cantonese Receptive Vocabulary Test (Cheung, Lee & Lee, 1997) and the Hong Kong kindergarten curriculum. As shown in Table 2, six types of sentences were selected for the word order condition. The 18 test items, with one-third of them in correct form, were arranged in a quasi-random order and are shown in Appendix A.

For the morphological violation condition, subjects' awareness of six types of morphemes was appraised (Table 3). The 22 test items, with six of them

714

TABLE 2. *Type of sentences and the word order changes*

Type	Word order changes
SVO	SVO → VSO & OVS
SAV/SVA	SAV → AVS & VAS
AVO	AVO → AOV & OVA
Existential verb (Ve)	Ve + N → N + Ve & SVeC CVeS
Negative marker (Vn)	Vn + N → N + Vn & VnOA OAVn
Copula verb (Vc)	SVcC → VcSC & SVcC CSVc

Length of sentences: 5–7 syllables ($M = 5\cdot8$). S = subject, V = verb, O = object, N = noun, A = adverb, SVeC = subject + existential verb + complement.

TABLE 3. *Type of morphemes and the morphological violations*

Type	Morpheme change
Classifier	Omission & substitution
Aspect markers	Omission & substitution
Existential verb	Omission
Negative marker	Omission
Copula verb	Omission
Coverb	Omission

Length of sentences: 4–7 syllables ($M = 5\cdot3$).

in correct form, were also arranged in a quasi-random order and are shown Appendix A.

Before the experiment was carried out, all test stimuli were judged by three adults and two school-age children (aged 8;7 and 6;6) who are all native speakers of Cantonese. They all agreed on the acceptability of the sentences. Only minor modifications of the pictures were made.

Procedure

Each subject was tested individually in a quiet environment by the experimenter (first author). The children's language proficiency was tested with the Reynell Developmental Language Scale – Cantonese (Reynell & Huntley, 1985; Cantonese version The Committee on Standardization of the Hong Kong RDLS, 1987), which assesses children's knowledge of words and syntax, prior to the administration of the awareness tasks. For the awareness tasks, the word order condition and the morphological violation condition were counter-balanced. The three-year-old subjects completed a vocabulary test (see Appendix B) before receiving the awareness tasks. Each child named the object, action or location depicted in the picture after a question prompt (for example, 'what is that?'). A binary choice was used for children who did not label the item spontaneously.

The instructions and items were presented to the children using two hand puppets, one for each condition, in an attempt to alert the subjects to the different nature of the tasks (Pratt *et al.*, 1984). For the word order condition, subjects were asked to say 'right' if they thought the sentence was correct and 'wrong' if the words in the sentence were scrambled. For the morphological violation condition, each subject was instructed to say 'right' if he/she thought the sentence was correct and 'wrong' if there was either an omission or substitution of a word in the sentence. For both conditions, the experimenter would prompt the subject to make a revision if he/she judged a sentence 'wrong' but had not given a spontaneous repair. This of course implies that subjects who did not judge a sentence as 'wrong' were not prompted to make a revision of the sentence. In this way, the two tasks cannot be seen to be totally independent. Practice trials for each condition were presented with corrective feedback before the experimental trials (see Appendix C).

These instructions and procedure were formulated with the aim of minimising the linguistic and cognitive demands on the subjects (Nesdale & Tunmer, 1984); therefore, simple instructions were given without using abstract terminology. The practice trials were not to facilitate subjects' acquisition of the ability to do the task. Instead, they gave illustrations of the range of stimuli to be presented and helped subjects become familiarised with the procedure (Nesdale & Tunmer, 1984). As such, some of the practice trials were semantic rather than syntactic in nature. The point was to alert the child to 'funny' sentences, rather than to alert him/her to syntactic anomalies. To motivate child subjects, they were asked to be teachers of the two puppets, which was an interesting task to them, in the game. As a reward for his/her effort, each child was given a sticker at the end of the session. They were given praise for being good teachers during the change of the tasks; however, neutral reinforcement was given in the experimental trials.

At the start of the awareness tasks, all subjects were told they could ask for repetition of the sentence whenever necessary. The experimenter would also repeat the sentence once when the subject did not give a response within five seconds subsequent to the presentation of an item. Each sentence was presented verbally by the experimenter with a natural rate and normal intonation. Throughout the experiment, subjects were constantly reminded of the nature of the task that the puppet sometimes said things right, occasionally wrong. The whole procedure was audiotaped.

Scoring

All subjects' responses were written down during the session and transcribed orthographically from the tape recordings by the first author. The scoring of syntactic awareness tasks was based on the following criteria:

716

Judgement task. Subjects' responses were scored on the number of correct judgements. A correct judgement scored 1 in both conditions. Hence, each subject would obtain a word order judgement score (WOJ) that ranged from 0 to 18 and a morphological judgement score (MJ) ranging from 0 to 22. The scores of each subject were expressed as percentages for analysis.

Revision task. In both conditions, a score of 1 was given when the subject gave a grammatical response and the meaning of the sentence was not significantly altered. A response was incorrect and scored 0 when a subject repeated whole or part of the sentence or altered the meaning of the sentence significantly or reordered the sentence to an unacceptable word order. Each subject would then gain a word order revision score (WOR) and a morphological revision score (MR), both from a possible 12 correct.

Erroneous revisions were coded into categories that would help us examine the ways subjects revised the grammatically deviant sentences.

    (a)   Repetition or partial repetition – the subject was aware that the sentence was ungrammatical but could not fix it. He/she just repeated the stimulus as a response to the experimenter's prompt for revision.

    (b)   Meaning-change – the subject was able to repair the stimulus in a grammatical way but, at the same time, changed the meaning of the sentence substantially. Some subjects revised the sentences by relating to their own experience.

    (c)   Ungrammatical-reordering – the subject detected the syntactic error and made an attempt to repair the stimulus. Nevertheless, he/she was not able to turn it to a grammatical form. This type of error only occurred in the word order revision.

The number of responses in each category of errors was counted for each subject. One week after the first transcription, 10 % of the audio tapes were re-transcribed by the first author, resulting in an intra-coder reliability of 97·26 %. Likewise, 10 % of the audiotapes were translated by a second listener, yielding an inter-coder reliability of 99·03 %.

Exclusion of subjects

A passing standard was predetermined on the language measure: a subject had to score within +1·5 S.D. and −1·0 S.D. of the mean on both receptive and expressive parts of the RDLS. Three children (two aged three and one aged five) were excluded as they scored greater than 1·0 S.D. below the mean (which suggested they had a language delay) for their corresponding chronological ages. Another three children (two aged three and one aged seven) were removed from the study because they had difficulty in understanding the instructions of the awareness tasks despite conditioning. Six children, four aged five and two aged seven, scored at least 1·0 S.D. above the

mean scores in the grammaticality judgement task in any one of the conditions for their respective age groups. As the extreme values might influence the calculations of the correlation coefficients between the language measure and the awareness tasks, their scores were not included in the data analysis. Consequently, fifty-six participants' scores were included in the analysis of data. Table 1 shows the information of the fifty-six participants.

RESULTS

Findings from both child and adult subjects indicated that the four items assessing the awareness of aspect markers in the morphological violation condition were not sensitive enough in discriminating between subjects' performance. There are two reasons that account for such finding: (a) The nonobligatory nature of aspect markers – Matthews & Yip (1994) state that aspect markers are grammatically optional (i.e. they may be omitted) and the choice of them is dependent on the context and the speaker (however we had attempted to control for this factor) and (b) the picture-props had not provided adequate contexts which obligated the usage of aspect markers in depicting the test sentences. As most subjects tended to judge these items as acceptable, the four items and the nondeviant counterpart were eliminated from the analysis. After this amendment, a subject would then gain a MJ that was within 0 to 17.

Metasyntactic performance

The mean correct scores and the standard deviations (S.D.) in both judgement and revision tasks in both conditions for the four age groups are shown in Table 4. A (4) age × (2) task (judgement vs. revision) × (2) condition (word

TABLE 4. *Mean correct scores and standard deviations* (*S.D.*) *of the four age groups*

Condition	Age				$F_{(3,52)}$
	3	5	7	20	
WOJ[a] (S.D.)	60·79	84·43	92·79	100·00	29·98****
MJ[a]	(18·05)	(12·89)	(7·12)	(0·00)	
MJ (S.D.)	45·64	69·36	86·29	100·00	65·15****
	(12·30)	(16·70)	(6·41)	(0·00)	
WOR (S.D.)	2·36	7·50	10·50	12·00	72·33****
	(2·28)	(2·65)	(1·34)	(0·00)	
MR (S.D.)	2·21	6·00	9·14	12·00	81·42****
	(2·08)	(2·35)	(1·51)	(0·00)	
N	14	14	14	14	

[a] Mean scores are computed in percentages. **** $p < 0.0000$. WOJ = word order judgement, MJ = morphological judgement, WOR = word order revision, MR = morphological revision.

718

order vs. morphological violation) analysis of variance was performed on the data. A significant interaction effect ($F(3,52) = 4.72$, $p < 0.01$), was obtained among these variables, suggesting there should be differences on the level of difficulty of tasks and conditions among the groups.

Effect of age

The significant main effect for age ($F(3,52) = 82.66$, $p < 0.0001$), on all types of scores suggests the ability to reflect on syntactic rules increases with age. To have a better understanding of the between-group differences, *post hoc* comparisons were calculated. For the judgement task (Table 5), *post hoc*

TABLE 5. *Results of post hoc Scheffé test on judgement and revision scores in both conditions*

					Judgement scores				
WOJ	3	5	7	20	MJ	3	5	7	20
3		*	*	*	3		*	*	*
5			*		5			*	*
7					7				*
20					20				
					Revision scores				
WOR	3	5	7	20	MR	3	5	7	20
3		*	*	*	3		*	*	*
5			*	*	5			*	*
7					7				*
20					20				

* Indicates significant difference at $p < 0.05$. WOJ = word order judgement, WOR = word order revision, MJ = morphological judgement, MR = morphological revision.

Scheffé tests indicated statistically significant differences between three-year-olds and all other groups, and between five-year-olds and adults in the word order condition. Significant differences between all age groups were found in the morphological violation condition.

For the revision task (Table 5) *post hoc* Scheffé tests showed statistically significant differences between all groups except between the comparison of group seven-year-olds & adults in the word order condition. Again, significant differences between all combinations of age groups were noted in the morphological violation condition.

Effect of word order versus morphological condition

There was a significant main effect for condition ($F(1,52) = 4653.06$, $p < 0.0001$). Paired *t*-tests were conducted to determine whether the observed differences in mean scores within the same task in each child group were attributable to condition (Table 6).

The judgement scores in the word order condition were significantly higher than those in the morphological violation condition in all three

719

TABLE 6. *Differences between scores on condition*

Age	WOJ Vs MJ	WOR Vs MR
3	15·14*	0·14
5	15·07**	1·50
7	6·50**	1·36**

*$p < 0.05$, **$p < 0.01$. WOJ = word order judgement, MJ = morphological judgement, WOR = word order revision, MR = morphological revision.

TABLE 7. *Pearson's r coefficients between judgement and revisions scores in both conditions*

Age		WOR	MR
3	WOJ	0·58*	—
	MJ	—	0·86***
5	WOJ	0·66*	—
	MJ	—	0·93***
7	WOJ	0·72**	—
	MJ	—	0·79**

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. WOJ = word order judgement, MJ = morphological judgement, WOR = word order revision, MR = morphological revision.

groups. This indicates that the word order judgement was easier than the morphological violation judgement. On the other hand, the word order revision was easier than the morphological revision for only the seven-year-old group.

Effect of task

The main effect for task was also significant ($F(1,52) = 23·23$, $p < 0·001$). The judgement scores were significantly higher than the revision scores in both conditions for all child groups. This finding suggests the judgement task was easier than the revision task. To further examine the relation between judgement and revision tasks in reflecting children's syntactic awareness, Pearson product-moment correlation tests were carried out.

As shown in Table 7, there were significant positive correlations between judgement and revision tasks in both conditions. Particularly, morphological judgement and revision scores showed a strong positive association. This implies that stronger subjects, who have higher syntactic awareness of morphology in sentences, are usually equally good at making judgements and revisions, and the opposite happens for the weaker subjects. Conversely, in word order condition, some three- and five-year-old subjects scored higher in judgement than revision: they seemed more capable of judging rather than revising sentences with word order changes.
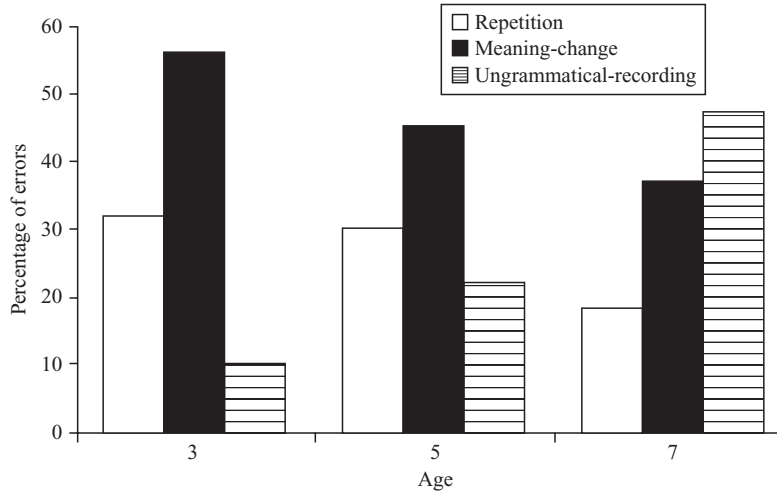
Fig. 1. Types and percentages of erroneous revisions made by child subjects on the word order task.

TABLE 8. *Correct revisions to the six syntactic structures with word order changes* (%)

Age	SVO	SVA/SAV	AVO	Existential	Negative	Copula
3	39 (11)	21 (6)	14 (4)	11 (3)	18 (5)	14 (4)
5	89 (25)	68 (19)	79 (22)	61 (17)	50 (14)	29 (8)
7	96 (27)	96 (27)	82 (23)	93 (26)	86 (24)	71 (20)

Figures in parentheses are number of correct revisions (out of 28) in the whole group. S = subject, V = verb, O = object, A = adverbial.

Effect of condition-order

An ANOVA, with condition-order being the independent variable, revealed no significant difference ($F(1,54) = 0.03$, $p > 0.05$), between subjects' scores.

Further analysis of erroneous revisions

An in-depth examination of the erroneous revisions may help us understand the strategies that children used to revise ungrammatical sentences. The pattern of erroneous revisions in word order condition is shown in Figure 1.

Two patterns are illustrated in Figure 1. The three- and five-year-olds tended to adopt a semantic strategy instead of executing their grammatical knowledge while the seven-year-olds appeared to use knowledge of grammatical rules, although unsuccessfully, to repair the grammatically deviant sentences. The use of a semantic strategy to make revisions decreased with age whereas application of partially developed grammatical knowledge

increased with age. For morphological revision, there were only repetition and meaning-change errors in subjects' responses in which the latter predominate.

To see whether some types of ungrammatical sentences are easier to revise than others, subjects' success rates in making correct revisions in relation to the types of sentences was computed (Tables 8 and 9). The relative ease of

TABLE 9. *Correct revisions of sentences with five types of morphological violations* (%)

Age	Classifier[a]	Existential	Negative	Copula	Coverb
3	36 (10)	18 (5)	39 (11)	1 (4)	1 (4)
5	86 (24)	46 (13)	86 (24)	25 (7)	25 (7)
7	100 (28)	89 (25)	75 (21)	75 (21)	68 (19)

Figures in parentheses are number of correct revisions (out of 28) in the whole group.
[a] Only the correct revisions to sentences with omission of classifiers were counted.

revision varied across the age groups, although all groups generally found revisions to SVO and SVA easier than other word order revisions; and all age groups found the copula and coverb violations harder to revise than other morphological revisions.

DISCUSSION

Comparing the overall group performance on metasyntactic tasks (Table 4), the three-year-old subjects scarcely displayed syntactic awareness (performance just around chance level) while the five-year-olds appear to manifest an intentional monitoring of grammatical rules. The seven-year-olds almost attain adult-like performance. With reference to Gombert's model, the youngest subjects are in the earliest phase of metasyntactic development. Being young language users/learners, the mastery of primary linguistic skills is imperative for successful communication at the onset of language development. With limitations in cognitive capacities, their energies are devoted to the acquisition of language rules, which will form the basis of growing episyntactic control. According to Van Kleeck (1982), children in the preoperational stage of cognitive development are merely able to attend to the most salient perceptual aspect of a given situation and are strongly attuned to meaning of messages; therefore, they could seldom stand back from the content and focus on the linguistic form. This may also explain their tendency to use semantic strategies to revise ungrammaticalities.

The five-year-old subjects exhibit awareness of language rules as their performance is markedly different from the youngest group in this experimental context. They are oscillating between the second and third phase of metasyntactic development. Evidently, they have acquired episyntactic

control: they have already mastered the fundamental rules of language that are adequate for daily effective verbal exchanges and, presumably, an organization of the implicit knowledge is in progress. Their ability to consciously reflect on linguistic rules is emerging yet has not been firmly established. The reason is that their ability to judge and revise ungrammaticalities appears incidental (performance is ad hoc) to task demands. They tried to apply grammatical knowledge to revise ungrammatical sentences but resorted to a semantic strategy most of the time. Nonetheless, these manipulations of language can later develop into a true and stable metasyntactic ability.

The seven-year-olds reveal awareness and intentional monitoring of syntactic rules. Learning to write and read at school probably triggers the emergence of metasyntactic ability (Romaine, 1984; Gombert, 1992). The influence of literacy can be traced in the data: some seven-year-old subjects used literary forms (formal Standard Chinese – the written form of Mandarin) instead of their colloquial forms (Cantonese dialect) to revise sentences with morphological violations. These subjects, in the operational stage of cognitive development with improved reasoning abilities, were able to shift away from the content of the message and focus on its linguistic form *per se* (Van Kleeck, 1982). Through explicit learning of grammatical rules, it is plausible that their metasyntactic awareness will become automated, always being available to conscious access, like adults' performance.

Word order awareness versus morphological awareness

Cantonese-speaking children's awareness of word order rules precedes the development of morphological awareness as indicated by significantly higher WOJ scores than MJ scores (Table 4). The development of word order awareness is complete by the age of seven since there is no significant difference between the seven's and adults' performance in both judgement and revision tasks (Table 5). Five-year-old subjects' word order awareness is still developing: their WOJ are significantly different from adults' and their WOR are significantly different from those of the seven-year-olds' and adults'. Therefore, they function in phase 2 of metasyntactic development, and only incidentally, in phase 3. The three-year-olds also find word order judgement tasks easier though they have not developed the competence to consciously manipulate the syntactic rules. The developmental pattern for morphological awareness is clearly defined with the three-year-olds in phase 1, five-year-olds in phase 2 and seven-year-olds in phase 3 (Table 5).

In studies of English, Hakes (1980) found that children were more capable of JUDGING sentences with word order changes than with morphological violations; Pratt *et al.*'s (1984) study showed children aged five and six found word order REVISION tasks more difficult than morphological revisions. The former study employed solely a judgement task while the latter used a

revision task alone. Results of the present study concur with both studies. Word order changes usually render the original sentence meaningless (Pratt *et al.*, 1984). Moreover, a change in word order generally involved more than one kind of deviance; hence, this kind of ungrammaticality should more easily be detected (Hakes, 1980). Lee (1996) states that young children (as early as three) are sensitive to the canonical word order of their language and use it to interpret sentences with variant word order. Cheung (1993) asserts Cantonese-speaking children consistently use a word order strategy to decode semantic relations in sentences. As word order plays a prominent role in sentence-interpretation in Cantonese, a subtle violation to the word order rules in sentences can be easily discerned.

Hakes (1980) did not address why sentences with morphological violations were less easy to judge as unacceptable. Cantonese is an isolating language with little, if any, inflection (Matthews & Yip, 1994). Different from the inflections in English (e.g. tense and plural markers) which carry a heavy functional load, the deletion of just a single Cantonese morpheme/syllable in each target sentence does not usually result in a remarkable change in meaning. This is particularly evident in the judgement of sentences with the omission of coverb, copula verb and classifier. Moreover, subjects had to attend to each morpheme (they needed to consciously manipulate solely the form) of the sentence in order to spot the ungrammaticality. This may account for the relatively poorer performance in the morphological judgement task.

Pratt *et al.* (1984) attributed subjects' better performance in morphological revision than word order revision to the early mastery of the morphemes involved in children's spontaneous speech. They claimed word order changes convert the meaning of the original sentence to such a large extent that greater effort is required to return it to a grammatical form. Their second assertion seems useful in explaining the finding that the three- and five-year-old subjects (who have either little or partially-developed metasyntactic awareness) do not find revision in any one of the conditions easier, even though the five-year-olds performed significantly better in both revision tasks than the three-year-olds. The fact that the seven-year-olds find revising sentences with word order changes easier than those with morphological violations refutes the above-mentioned claim. In this study it is possible that the child, having grasped the meaning of the sentence, reestablishes it by consciously applying his/her knowledge of syntactic rules to any acceptable order. However, in the case of morphological revision, he/she has to identify the incorrect section of the sentence and actively search for a specific morpheme from the mental lexicon to repair it. Although the seven-year-olds are already equipped with the ability to focus on the content and form of the sentence concurrently, the demands of morphological revision task appear greater than that of word order revision. Again, academic challenges may be

a factor that boosts the abilities to do word order revision. It is possible that schooling provides prior exposure to word order exercises, consequently it would be reasonable for them to have higher WOR.

By and large, Cantonese-speaking children's early development of word order rules, which quickens the acquisition of episyntactic control, contributes to the early emergence of word order awareness over morphological awareness. Literacy and concomitant cognitive growth also play a part in the growth of word order awareness (Chan, 1993).

Effectiveness of judgement and revision tasks

In tapping children's syntactic awareness, many researchers have commented on the pros and cons of judgement and revision tasks (Pratt *et al.*, 1984; Gombert, 1992). There is a likelihood of a response bias in judgement tasks and it is often difficult to justify the basis on which children make judgements. Conversely, a correction task requires a higher level of processing capacity than judgement tasks (as it requires the subject to hold the sentence in working memory and articulate the response) and a failure to revise ungrammatical sentences does not necessarily mean a lack of syntactic awareness.

The findings in this study clearly support the claim that a judgement task is easier than a revision task due to the differences in task demands. Both tasks, however, are equally good at unveiling patterns of metasyntactic development as the scores in both tasks are positively correlated (Table 7). Some three-year-olds scored higher in the judgement than the revision task. Thus, the judgement task, with less task demands, seems more appealing to tap the syntactic awareness of very young children. In this study, a word order revision task was able to capture the partially developing nature of metasyntactic growth of the five-year-olds. Consequently, it is recommended that both tasks should be included experimentally to trace the pattern of metasyntactic development provided that instructions, practice trials and the type of response sets are carefully planned.

Further elaboration on word order and morphological awareness

Chan (1993) investigated five- and eight-year-old children's development of word order awareness via grammaticality judgement and revision tasks. She reported that the development of word order awareness coincides with the sequence of acquisition of three sentence structures: SVO > SAV > AVO. The easiest sentences to revise are those that violate the canonical word order of Cantonese. It is thus plausible to say the order of Subject–Verb–Object is robust in Cantonese. Children within the same age group and between different age groups show variability in the awareness of the order of the other three syntactic structures (existential verb, copula verb and negative).

725

There has been little work on the emergence of existential verb, copula verb and coverb, and none that investigates Cantonese-speaking children's awareness of morpheme deletions in sentences. As shown in Table 9, children aged three and five manifest almost the same pattern of awareness to all tested morphemes: they are most capable of detecting and revising sentences with omission of a negative marker and least capable for a coverb and a copula verb. The saliency of the semantic functions of a negative marker (it denotes nonexistence and/or denial semantically) in daily speech and children's early mastery of this morpheme may contribute to children's development of such a 'high awareness'. On the contrary, the optional nature of the copula verb in everyday speech and the relatively small amount of semantic information that coverbs and copula verbs carry may underpin a 'low awareness'. The seven-year-olds demonstrate a slightly different pattern of awareness to the studied morphemes. It is assumed that as they are able to reflect on morphology consciously, the way they intentionally monitor the linguistic form is possibly more individualized: awareness to a linguistic form depends on the child's own linguistic experience.

It is worth noting that children of all three groups generally have little awareness of substitution of classifiers. Most subjects, even the seven-year-olds, tended to accept the use of the mixed classifier goh_3 instead of zek_3 in describing cows and, again, the mixed classifier zek_3 for a more specific one $zoeng_1$ in describing a bed. Besides, the use of a default classifier goh_3 to repair the omission error was common among the three groups of children. These findings lend additional support to other researchers' observations (Stokes & So, 1997) on children's erroneous use of classifiers in other experiments. That is, children readily accept generic classifiers (like goh_3 and zek_3) for more specific classifiers like $zoeng_1$ and pass through a stage in the production of classifiers where the need to use a classifier is recognised, but a general classifier is used in place of the more correct specific classifier. Children's high awareness (in all three groups) to the omission of classifiers in sentences is also indicative that the classifier in Cantonese is a salient entity with its own unique syntactic characteristics.

CONCLUSION

The present results support the claims from studies of English and other languages that suggest that the ability to reflect upon the grammatical rules of language advances with age. Using the terms suggested by Grieve, Tunmer & Pratt (1983), preschoolers are not in ABSENCE of metasyntactic skills, but in their DEPLOYMENT which best depict the five-year-old subjects' performance. School experiences probably are a catalyst in the development of various metalinguistic skills. Gombert's (1992) conceptions of episyntactic and metasyntactic awareness capture the essence of the process of becoming

syntactically conscious. The difference in success (within groups) of correcting morphological violations varied by marker, apparently according to each marker's degree of obligatory use in the language. It would seem then that syntactic awareness is very much affected by language-specific syntactic characteristics.

REFERENCES

Bialystok, E. (1986). Factors in the growth of linguistic awareness. *Child Development* **57**, 498–510.

Chan, M. (1993). Development of word-order knowledge in Cantonese children: studied through grammaticality judgement and correction. Unpublished honours dissertation, The University of Hong Kong.

Chang, H.-W. (1992). The acquisition of Chinese syntax. In H. C. Chen & O. J. L. Tzeng (eds), *Language processing in Chinese*. Amsterdam: North Holland.

Cheung, P. (1993). *Comprehension of grammatical structures in Cantonese-speaking preschoolers: Cantonese adaptation of TROG*. Unpublished honours dissertation, The University of Hong Kong.

Cheung, P. S. P., Lee, K. Y. S. & Lee, L. W. T. (1997). The development of the 'Cantonese Receptive Vocabulary Test' for children aged 2–6 in Hong Kong. *European Journal of Disorders of Communication* **32**, 127–38.

Dash, U. N. & Mishra, H. C. (1992). Bilingualism and metalinguistic development: evidence from Kond tribal culture. *Psychological Studies* **37**, 81–7.

Erbaugh, M. S. (1992). The acquisition of Mandarin. In D. I. Slobin (ed.), *The cross-linguistic study of language acquisition*. London: Erlbaum.

Flores, O. C. (1995). Metapragmatic awareness. *Lestra de Hoje* **30**, 121–37.

Gleitman, L. R., Gleitman, H. & Shipley, E. F. (1972). The emergence of the child as grammarian. *Cognition* **1**, 137–64.

Gombert, J. E. (1992). *Metalinguistic development*. Chicago: University of Chicago Press.

Grieve, R., Tunmer, W. E. & Pratt, C. (1983). Language awareness in children. In M. Donaldson, R. Grieve & C. Pratt (eds), *Early childhood development and education*. Oxford: Blackwell.

Hakes, D. T. (1980). *The development of metalinguistic abilities in children*. Berlin: Springer-Verlag.

Kam, A. (1996). *Syllable, rhyme and phoneme awareness in phonologically impaired preschoolers*. Unpublished honours dissertation, The University of Hong Kong.

Karanth, P., Kudva, A. & Vijayan, A. (1995). Literacy and linguistic awareness. In B. de Gelder & J. Morais (eds), *Speech and reading: a comparative approach*. Hove, UK: Erlbaum UK.

Karmiloff-Smith, A. (1986). From meta-processes to conscious access: evidence from metalinguistic and repair data. *Cognition* **23**, 95–147.

Karmiloff-Smith, A., Grant, J., Sims, K., Jones, M-C. & Cuckle, P. (1996). Rethinking metalinguistic awareness: representing and accessing knowledge about what counts as a *word*. *Cognition* **58**, 197–219.

Lee, T. H. T. (1996). Theoretical issues in language development and Chinese child language. In C. T. J. Huang & Y. H. A. Li (eds), *New horizons in Chinese Linguistics*. Netherlands: Kluwer Academic Press.

Lee, T. H. T., Wong, C. H., Leung, C. S., Man, P., Cheung, A., Szeto, K. & Wong, C. S. P. (1996). *The development of grammatical competence in Cantonese-speaking children*. Report of a project funded by RGC earmarked grant CUHK 2/91.

Matthews, S. & Yip, V. (1994). *Cantonese: a comprehensive grammar*. London and New York: Routledge.

McDaniel, D. & Cairns, H. S. (1996). Eliciting judgements of grammaticality and reference. In D. McDaniel, C. McKee & H. S. Cairns (eds), *Methods for assessing children's syntax*. Massachusetts: MIT.

Nakamura, K. (1997). Gender-based differences in the language of Japanese preschool children: a look at metalinguistic awareness. In E. V. Clark (ed.), *The Proceedings of the Twenty-eighth Annual Child Language Research Forum*. Stanford CA: Center for the Study of Language and Information.

Nesdale, A. R., Herriman, M. L. & Tunmer, W. E. (1984). Phonological awareness in children. In W. E. Tunmer, C. Pratt & M. L. Herriman (eds), *Metalinguistic awareness in children: theory, research, and implications*. Berlin: Springer-Verlag.

Nesdale, A. R. & Tunmer, W. E. (1984). The development of metalinguistic awareness: a methodological overview. In W. E. Tunmer, C. Pratt & M. L. Herriman (eds), *Metalinguistic awareness in children: theory, research, and implications*. Berlin: Springer-Verlag.

Ng, K. (1994). *Investigation of comprehension strategies used by Cantonese-speaking children*. Unpublished honours dissertation, The University of Hong Kong.

Ostern, A. L. (1991). Proficiency in correct syntax as an expression of linguistic awareness. In K. Herberts & C. Lauren (eds), *Multilingualism in Nordic countries and beyond*. Finland: Abo Akademi.

Packard, J. L. (1993). *A linguistic investigation of aphasic Chinese*. Dordrecht: Kluwer Academic Publishers.

Pratt, C. & Nesdale, A. R. (1984). Pragmatic awareness in children. In W. E. Tunmer, C. Pratt & M. L. Herriman (eds), *Metalinguistic awareness in children: theory, research, and implications*. Berlin: Springer-Verlag.

Pratt, C., Tunmer, W. E. & Bowey, J. A. (1984). Children's capacity to correct grammatical violations in sentences. *Journal of Child Language* **11**, 129–41.

Reynell, J. & Huntley, M. (1985). *Reynell Developmental Language Scales*. Windsor: NFER-Nelson. The Committee on Standardisation of the Hong Kong Version of the RDLS (1987). *RDLS Scales (Hong Kong version)*.

Romaine, S. (1984). *The language of children and adolescents: the acquisition of communicative competence*. Oxford: Blackwell.

Romaine, S. (1999). Bilingual language development. In M. Barrett (ed.), *The development of language*. Hove, UK: Psychology Press Ltd, Publishers.

Rossi, F. & Pontecorvo, C. (1989). The metalinguistic ability of elementary school children. *Rassegna Italian di Linguistica Applicata* **21**, 219–40.

Smith, C. L. & Tager-Flusberg, H. (1982). Metalinguistic awareness and language development. *Journal of Experimental Child Psychology* **34**, 449–68.

Stokes, S. F. & So, L. K. H. (1997). Classifier use by language-disordered and age-matched Cantonese-speaking children. *Asia Pacific Journal of Speech, Language and Hearing* **2**, 83–101.

Sutter, J. C. & Johnson, C. J. (1990). School-age children's metalinguistic awareness of grammaticality in verb form. *Journal of Speech and Hearing Research* **33**, 84–95.

Tam, C. W. Y. & Stokes, S. F. (2001). Form and function of negation in early developmental Cantonese. *Journal of Child Language* **28**, 373–391.

Van Kleeck, A. (1982). The emergence of linguistic awareness: a cognitive framework. *Merrill-Palmer Quarterly* **28**, 237–65.

Wong, G. (1997). *Phonological awareness of Cantonese-speaking language-disordered children*. Unpublished honours dissertation, The University of Hong Kong.

Woo, C. Y. M. (1993). *Phonological awareness in 4–6 year old Cantonese-speaking children*. Unpublished honours dissertation, The University of Hong Kong.

APPENDIX A
EXPERIMENTAL STIMULI

Set A – Sentences with word-order changes

		Stimuli[a]	Original sentences
SVO[b]	1.	唱緊　　妹妹　　歌(VSO) $cœŋ_3gen_2$　mui_4mui_1　$gɔ_1$ sing AM　younger sister　song singing a song is sister	妹妹　　唱緊　　歌 mui_4mui_1　$cœŋ_3gen_2$　$gɔ_1$ sister　sing AM　song sister is singing a song
	2.	張凳　推　開　爸爸(OVS) $zœŋ_1deŋ_3$　$tœy_1$　$hɔi_1$　ba_4ba_1 Cl　chair push　away　father a chair pushes away father	爸爸　推　開　張　凳 ba_4ba_1　$tœy_1$　$hɔi_1$　$zœŋ_1$　$deŋ_3$ father　push　away　Cl chair father pushes away a chair
	3.	小朋友　玩　玩具(SVO) $siu_2peŋ_4jeu_5$　wan_2　$wun_6gœy_6$ kid　play　toy the kids play with toys	小朋友　玩　玩具 $siu_2peŋ_4jeu_5$　wan_2　$wun_6gœy_6$ kid　play　toy the kids play with toys
SVA	4.	口係　廁所　洗　手　哥哥(AVS) $hœŋ_2$　$ci_4sɔ_2$　$sɐi_2$　seu_2　$gɔ_4gɔ_1$ at　washroom　wash hand　elder brother at the washroom washes hands brother	哥哥　口係　廁所　洗　手 $gɔ_4gɔ_1$　$hœŋ_2$　$ci_4sɔ_2$　$sɐi_2$　seu_2 elder brother　at　washroom　wash　hands brother washes his hands at the washroom
	5.	玩　口係　公園　妹妹(VAS) wan_2　$hœŋ_2$　$guŋ_1jyn_4$　mui_4mui_2 play　at　park　younger sister plays at a park sister	妹妹　口係　公園　玩 mui_4mui_2　$hœŋ_2$　$guŋ_1jyn_4$　wan_2 younger sister　at　park　play sister plays at a park
	6.	哥哥　訓　口係　床　度(SVA) $gɔ_4gɔ_1$　fen_3　$hœŋ_2$　$cɔŋ_4$　dou_6 elder brother sleep at　bed　Loc brother sleeps in a bed	哥哥　訓　口係　床　度 $gɔ_4gɔ_1$　fen_3　$hœŋ_2$　$cɔŋ_4$　dou_6 elder brother　sleep　at　bed　Loc brother sleeps in a bed

		Stimuli	Original sentences
AVO	7.	口係　　學校　　書　　　教(AOV)	口係　　學校　　教　　書
		hœŋ₂　hɔk₂hau₆　sy₁　　gau₃	hœŋ₂　hɔk₂hau₆　gau₃　sy₁
		at　　school　book　teach	at　　school　teach　book
		at school students (someone) teaches	at school (someone) teaches students
	8.	韆鞦　　打　口係　　公園(OVA)	口係　公園　　打　　　韆鞦
		cin₁ceu₁　da₂　hœŋ₂　guŋⱼjyn₂	hœŋ₂　guŋⱼjyn₂　da₂　　cin₁ceu₁
		swing　　play　at　　park	at　　park　　play　swing
		a swing (someone) plays on at a park	at a park (someone) plays on a swing
	9.	口係　屋企　　做　　功課(AVO)	口係　屋企　　做　　　功課
		hœŋ₂　uk₇kei₂　zou₃　　guŋⱼfɔ₃	hœŋ₂　uk₇kei₂　zou₃　　guŋⱼfɔ₃
		at　home　do　homework	at　home　do　homework
		at home (someone) does homework	(someone) does homework at home.
SVC	10.	口係　檯　企度　　枝花　　有	口係　檯度　　有　枝　花
		hœŋ₂　tɔi₂　kei₂dou₆　zi₁fa₁　　jeu₅	hœŋ₂　tɔi₂dou₆　jeu₅　zi₁　fa₁
		at　　table　there Cl flower　　have	at　　table Loc　have　Cl　flower
		At the table there is a flower	There's a flower on the table
	11.	著　　鞋　有　弟弟	弟弟　　　　有　　著　　鞋
		zœk₈　hai₄　jeu₅　dei₃dei₄	dei₃dei₄　　jeu₅　zœk₈　hai₄
		wear　shoe　have　younger brother	Younger brother　have　wear　shoes
		worn shoes has brother	brother has worn shoes
	12.	樹　上面　　有　隻　雀仔	樹　　上面　　有　隻　　雀仔
		sy₆　sœŋⱼmin₆　jeu₅　zek₈　zœk₃zei₃	sy₆　sœŋⱼmin₆　jeu₅　zek₈　zœk₃zei₃
		tree　on top　have　Cl　bird	tree　on top　have　Cl　bird
		there's a bird on the tree	there's a bird on the tree

	Stimuli	Original sentences

SVC Negative marker	13. 粒　糖　無　食　姐姐 lɐk₇　tɔŋ₂　mou₂　sik₉　ze₄ze₆ cl　candy　not　eat　elder sister the candy didn't eat sister	姐姐　無　食　粒　糖 ze₄ze₆　mou₂　sik₉　lɐk₇　tɔŋ₂ elder sister　not　eat　Cl　candy sister didn't eat the candy
	14. 奶　□係　杯　度　無 lai₅　hœŋ₂　bui₁　dou₆　mou₂ milk　at　cup　Loc　no milk in the cup no	無　奶　□係　杯度 mou₂lai₅　hœŋ₂　bui₁dou₆ no　milk　at　cup Loc There is no milk in the cup
	15. 書包　裏面　無　書 sy₁bau₁　lœy₂min₆　mou₄　sy₁ schoolbag　inside　no　book There is no book inside the schoolbag	書包　裏面　無　書 sy₁bau₁　lœy₂min₆　mou₄　sy₁ schoolbag　inside　no　book There is no book inside the schoolbag
SVC Copula verb	16. 係　隻　貓　黃色　□既 hɐi₆　zek₈　mau₁　wɔŋ₄sik₇　ge₆ is　Cl　cat　yellow　sfp is the cat yellow	隻貓　係　黃色　□既 zek₈mau₁　hɐi₆　wɔŋ₄sik₇　ge₆ Cl　cat　is　yellow　sfp The car is yellow
	17. 高　□既　哥哥　係 gou₁　ge₆　gɔ₄gɔ₁　hɐi₆ tall　sfp　elder brother　is tall brother is	哥哥　係　高　□既 gɔ₄gɔ₁　hɐi₆　gou₁　ge₆ elder brother　is　tall　sfp brother is tall
	18. 爸爸　係　醫生 ba₁ba₁　hɐi₆　ji₁sɐn₁ father　is　doctor father is a doctor	爸爸　係　醫生 ba₁ba₁　hɐi₆　ji₁sɐn₁ father　is　doctor father is a doctor

Set B-Sentences with morphological violations

	Stimuli	Original sentences
Omission of Cl (classifiers) 1.	妹妹　　　揇住　　三　　筆(SVO) mui₆mui₆　　za₁zy₆　　san₁　　bɐt₇ younger sister hold Am　three　pen sister holds three pens	妹妹　　　揇住　　三枝　　筆 mui₆mui₆　　za₁zy₆　　san₁ zik₇　　bɐt₇ Younger sister hold Am　three Cl　pen sister holds three pens
2.	弟弟　　　有　　兩　　書(SveO) dɐi₆dɐi₂　　jɐu₅　　lœŋ₅　　sy₁ younger brother have　two　book brother has two books	弟弟　　　有　　兩　　本書 dɐi₆dɐi₂　　jɐu₅　　lœŋ₅　　bun₂sy₁ younger brother have　two　Cl　book brother has two books
Substitution of Cl 3.	三　個　牛　食　草(SVO) san₁　gɔ₆　ŋɐu₄　sik₉　cou₂ three　Cl　cow　eat　grass three cows eat grass	三　隻　牛　食　草 san₁　zek₈　ŋɐu₄　sik₉　cou₂ three　Cl　cow　eat　grass three cows eat grass
4.	有　一　隻　床　喺　房度(VOA) jɐu₅　jɐt₇　zek₈　cɔŋ₄　hœŋ₂　fɔŋ₂dou₆ have one　Cl　bed　at　room there's a bed in the room	有　一張　床　喺　房度 jɐu₅　jɐt₇zœŋ₁　cɔŋ₄　hœŋ₂　fɔŋ₂dou₆ have　one　Cl　bed　at　room there's a bed in the room
5.	姐姐　有　三粒　糖(SveO) ze₄ze₆　jɐu₅　san₁lɐk₇　tɔŋ₂ elder sister　have　three Cl　candy sister has three sweets	姐姐　有　三粒　糖 ze₄ze₆　jɐu₅　san₁lɐk₇　tɔŋ₂ elder sister　have　three　candy sister has three sweets
Omission of AM (aspect marker) 6.	爸爸　食　飯(SVO) ba₄ba₁　sik₇　fan₆ father　eat　rice father eats rice	爸爸　食　咗/完//過　飯 ba₄ba₁　sik₇　jyn₄/guɔ₆　fan₆ father　eat　Vpart/AM　rice father has eaten/ate rice

	Stimuli	Original sentences
	7. 媽媽　　洗　　　　碗(SVO)	媽媽　　洗　　咗/完/過　　　碗
	ma₄ma₁　sɐi₂　　wun₂	ma₄ma₁　sɐi₂　jyn₄/guɔ₆　wun₂
	mother　wash　　bowl	mother　wash　Vpart/AM　bowl
	mother washes the bowls	Mother has washed/washed the bowl
Substitution 8.	媽媽　　掃　住　　地(SVO)	媽媽　　掃　咗/完/過　　　地
of AM	ma₄ma₁　sou₃　zy₄　dei₆	ma₄ma₁　sou₃　jyn₄/gwɔ₆　dei₆
	mother　sweep AM　floor	mother　sweepVpart/AM　flower
	mother is sweeping the floor	Mother has swept/swept the floor
	9. 弟弟　　　　飲　過　水	弟弟　　　　飲　緊　水
	dɐi₄dɐi₁　　jɐm₂　gwɔ₃　sœy₂	dɐi₄dɐi₁　　jɐm₂　gɐn₂　sœy₂
	younger brother　drink　AM　water	Younger brother drink　AM　water
	brother has drunk the water	brother is drinking the water
	10. BB　　喊 緊(SV)	BB　　喊緊
	bi₄bi₁　ham₃ gɐn₂	bi₄bi₁　ham₃ gɐn₂
	baby　cry AM	baby　cry AM
	baby is crying	baby is crying
Coverb 11.	姐姐　　　車　　裏面(SVA)	姐姐　　口係　車　　裏面
	ze₄ze₁　　ce₁　lœy₂min₆	ze₄ze₁　hœŋ₂　ce₁　lœy₂min₆
	elder sister　car　inside	elder sister　at　car　inside
	sister car inside	sister is inside the car
	12. 有　隻杯　檯　上面(VeOA)	有　　隻杯　口係　檯　上面
	jɐu₂　zek₆bui₁　tɔi₂　sœŋ₃min₆	jɐu₂　zek₆bui₁　hœŋ₂　tɔi₂　sœŋ₃min₆
	have　Cl cup　table　on top	have　Cl　cup　at　table　on top
	there a cup on the table	there is a cup on the table

733

		Stimuli				Original sentences			

| | 13. | 弟弟 | | 口係 | | 公園 | 跑步 | 弟弟 | | 口係 | | 公園 | 跑步 |

13. 弟弟　口係　公園　跑步　　弟弟　口係　公園　跑步
(SAV)
dɐi₄dɐi₁　hœŋ₂　guŋ₁jyn₂　pau₂bou₆
younger brother　at　park　runs
brother runs in the park

（Original）
dɐi₄dɐi₁　hœŋ₂　guŋ₁jyn₂　pau₂bou₆
younger brother　at　park　runs
brother runs in the park

Copula verb

14. 媽媽　老師　　　　媽媽　係　老師
ma₄ma₁　lou₅si₁　　ma₄ma₁　hɐi₆　lou₅si₁
mother　teacher　　mother　is　teacher
mother a teacher　　mother is a teacher

15. 姐姐　學生　　　　姐姐　係　學生
ze₄ze₁　hɔk₇saŋ₁　　ze₄ze₁　hɐi₆　hɔk₇saŋ₁
elder sister　student　　elder sister　is　student
sister a student　　sister is a student

16. 隻杯　係　黃色　(嘅)　　隻杯　係　黃色　(嘅)
zek₇bui₁　hɐi₆　hɔŋ₄sik₇　ge₁　　zek₇bui₁　hɐi₆　hɔŋ₄sik₇　ge₁
Cl　cup　is　yellow　sfp　　Cl　cup　is　yellow　sfp
the cup is yellow　　the cup is yellow

Existential verb

17. 杯　裏面　果汁　　杯　裏面　有　果汁
bui₁　lœy₂min₆　gwɔ₂zep₇　　bui₁　lœy₂min₆　jɐu₂　gwɔ₂zep₇
cup　inside　juice　　cup　inside　have　juice
The cup inside juice　　The cup contains juice

18. 弟弟　頭　上面　蝴蝶　　弟弟　頭　上面　有　蝴蝶
dɐi₄dɐi₁　tɐu₄　sɐŋ₃min₆　wu₄dip₉　　dɐi₄dɐi₁　tɐu₄　sɐŋ₃min₆　jɐu₂　wu₄dip₉
younger brother　head　above　butterfly　　younger brother head above have butterfly
There's a butterfly on brother's head　　There's a butterfly on brother's head

		Stimuli	Original sentences
	19.	有　　條魚　　口係　　　水度	冇　　條魚　　口係　　　水度
		jɐu₂　tiu₄jy₂　hœŋ₂　sœy₂dou₆	jɐu₂　tiu₄jy₂　hœŋ₂　sœy₂dou₆
		Have　Cl　fish　at　　water Loc	have　Cl　fish　at　　water Loc
		there's a fish in the water	there's a fish in the water
Negative	20.	妹妹　　　　頭　上面　帽	妹妹　頭　上面　無　帽
marker		mui₄mui₁　　tɐu₄　sɐŋ₃min₆　mou₂	mui₄mui₁　tɐu₄　sɐŋ₃min₆　mou₂mou₂
		younger sister　head　above　hat	younger sister head　above　no　hat
		sister is wearing a hat	sister is not wearing a hat
	21.	房　裏面　　　人	房　裏面　　無　人
		fɔŋ₂　lœy₂min₆　jɐn₄	fɔŋ₂　lœy₂min₆　mou₂　jɐn₄
		room　inside　　person	room　inside　　no　person
		there's a person in the room	there's no-one in the room
	22.	無　　人　　口係　車度	無　　人　　口係　車度
		mou₂　jɐn₄　hœŋ₂　ce₁dou₆	mou₂　jɐn₄　hœŋ₂　ce₁dou₆
		no　person　at　car Loc	no　person　at　car Loc
		there's no-one in the car	there's no-one in the car

Note. [a]The last sentence of each block is correct; [b]S = subject, V = verb, A = adverb, O = object, Ve = existential verb, AM = aspect marker, Loc = locative marker, Cl = classifier, Vpart = post-verbal particle.

735

APPENDIX B
VOCABULARY CHECK

Name: _____   Age/Sex: _____   D.O.B.: _____

Date: _____   Reynell test score: _____   Remark: _____

Objects	Romanised Form	English	Remarks	Objects	Romanised Form	English	Remarks
凳	den_3	chair		書包	$sy_1\,bau_1$	school bag (literally "book-bag")	
檯	toi_2	table		書	sy_1	book	
床	con_4	bed		玩具	wun_6goey_6	toy	
花	fa_1	flower		帽	mou_2	hat (actually the superordinate of these)	
樹	sy_6	tree		糖	ton_2	sweet	
草	cou_2	grass		果汁	gwo_2jep_7	fruit juice	
雀仔	$zœk_3\,zei_2$	bird		奶	lai_5	milk	
蝴蝶	wu_4dip_9	butterfly		杯	bui_1	cup	
魚	jy_2	fish		碗	wun_2	bowl	
牛	$ŋɐu_4$	cow		老師	lou_5si_1	teacher	
貓	mau_1	cat		醫生	$ji_1\,sen_1$	doctor	
頭	$tɐu_4$	head		學生	$hok_7\,san_1$	student	
韆鞦	$cin_1cɐu_1$	swing					

Actions	Romanised Form	English	Remarks	Actions	Romanised Form	English	Remarks
唱歌	$cœŋ_3 gɔ_1$	sing		洗手	$sɐi_2 sɐu_2$	wash…hands	
推(開)	$tœy_1 (hɔi_1)$	push (away)		教書	$gau_6 sy_1$	teach (literally "teach books")	
訓覺	$fɐn_3 gau_6$	sleep		做功課	$zou_6 guŋ_1 fɔ_3$	do…homework	
玩玩具	$wan_2 wun_6 gœy_6$	play with toys		揸筆	$za_1 bɐt_7$	hold a pen	
打韆鞦	$da_2 cin_1 cɐu_1$	ride on a swing					

Places	Romanised Form	English	Remarks	Places	Romanised Form	English	Remarks
廁所	$ci_4 sɔ_2$	toilet		公園	$guŋ_1 jyn_2$	park	
房	$fɔŋ_2$	room		學校	$hɔk_2 hau_6$	school	
車	ce_1	car		屋企	$uk_7 kei_2$	home	

Others	Romanised Form	English	Remarks	Others	Romanised Form	English	Remarks
裏面	$lœy_2 min_6$	inside		黃色	$hɔ_4 sik_7$	yellow	
上面	$sɐŋ_3 min_6$	on (top of)		高	gou_1	tall (depending on the sense)	

Comment:
_____
_____

737

APPENDIX C

TRANSLATION OF THE INSTRUCTIONS

Introducing the characters appearing in the pictures

I want to introduce to you some people. You will see them in the pictures later. This is father. [The experimenter pointed to the picture.] This is mother, elder brother, younger brother, elder sister and younger sister. These are children. Let me see whether you remember them. [Each subject would then be asked to name the characters which were just introduced.]

Word order condition. His (the first puppet) name is Gwaai$_1$ Gwaai$_1$. He does not talk well. He sometimes says things right, sometimes wrong. He says things in a scrambled order. I want you to help me teach him to talk. Gwaai$_1$ Gwaai$_1$ is going to tell you about the pictures. You have to pay attention to what he says. If he says things right, say right; if he says something wrong, or scrambles the words, say wrong and teach him the right way to speak. For example, he said,

mei_6 hou_2 hou_2 zyu_1 gu_1 lik_1
taste   very good   chocolate

Is it right or wrong? [The experimenter waited for the subject to indicate right or wrong and revise the sentence first.] He mixes the words up. It is wrong, isn't it? Then you should say wrong and teach him to say

zyu_1 gu_1 lik_1 hou_2 hou_2 mei_6
Chocolate   very good   taste

Let's say it together. Let's try to listen to what he says about these pictures …' [The experimenter would give the remaining practice trials. Further conditioning using the practice trials would be given to a subject until he/she gave consistent responses.]
Practice trials:

1. gwo_2 $ping_4$ $hung_4$ $hung_4$ $ping_4 gwo_2$
    apple   red   red   apple
2. lap_6 sap_3 doh_1 hou_2 hou_2 doh_1 lap_6 sap_3
    litter   much very very much litter
3. ng_3 go_3 bo_1 (five CL balls) [This is a correct item.]

Morphological violation condition. His (the second puppet) name is Hung Hung. Like 'Gwaai Gwaai', he does not talk well. He sometimes says things right, sometimes wrong. He may omit a word or use a wrong word. I want

738

you to be a teacher again, to help me teach him to talk. Let's listen to what he says. He said,

waan$_2$ jau$_4$ gei$_1$
play   machine

Is it right or wrong? [The experimenter waited for the subject to indicate right or wrong and revise the sentence first.] He omits a word. It is wrong. Then you should say wrong and teach him to say

waan$_2$ jau$_4$ hei$_3$ gei$_1$
play   game machine

Let's say it together '*waan$_2$ jau$_4$ hei$_3$ gei$_1$*'. Let's try to listen to what he says about another picture. He said

sik$_9$ din$_6$ waa$_2$
eat   telephone

Is it right or wrong? [The experimenter waited for the subject to indicate right or wrong and revise the sentence first.] He uses a wrong word. It should be

teng$_1$ din$_6$ waa$_2$
Listen through   the telephone

Let's listen to what he says …' [The experimenter would give the remaining practice trials. Further conditioning using the practice trials would be given to a subject until he gave consistent responses.]

Practice trials:

1.   *tai$_2$ si$_6$ tai$_2$ din$_6$ si$_6$*
      watch TV watch TV
2.   *hoh$_2$ lok$_6$ hou$_2$ hou$_2$ zeuk$_3$ hoh$_2$ lok$_6$ hou$_2$ hou$_2$ jam$_2$*
      Coca-cola good   wears Coca-cola   good taste
3.   *bun$_3$ pui$_1$ sui$_2$* (Half glass water) [This is a correct item.]