Relative clauses in early bilingual development: Transfer and universals[*]

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1. Introduction and Background

This paper investigates the development of English relative clauses in two bilingual children exposed to Cantonese and English from birth. The two subjects are siblings both of whom show dominance of Cantonese over English in their preschool years. Aspects of their English show features and structures that are quite unlike their monolingual counterparts, many of which are attributable to transfer from the dominant language, in this case Cantonese. One of the most striking Cantonese-based features observed in the first subject's English, the occurrence of prenominal relative clauses, is recapitulated in the second subject. Such prenominal relatives have not, to our knowledge, previously been documented in the acquisition of English by monolingual or bilingual children. In the initial stage of development, object relative clauses are produced with the head in final position, i.e. the relative clauses precede the head noun which they modify. In a subsequent stage, postnominal relatives occur with resumptive pronouns, before the target structures without such pronouns are eventually acquired.

From a typological perspective, the transfer of prenominal relative clauses is of particular interest for two reasons:

(i) prenominal relatives are a universally marked option, and especially rare in SVO languages, with Mandarin Chinese the only case instantiating this combination in many language samples (Hawkins 1990). Cantonese also instantiates the co-occurrence of SVO basic word order and prenominal relatives, as do other Sini-

tic languages.[1] The rarity of this combination of word order properties is attributable to processing considerations which disfavour it (Hawkins 1994). Nevertheless, prenominal relatives prove to be subject to transfer in early bilingual development. Our subjects each developed prenominal relatives in their English and Cantonese in parallel, indicating that transfer can play a prominent role in early bilingual development, as it does in second language acquisition. We shall suggest that the transfer of prenominal relatives is part of a more general pattern of prenominal modification.

(ii) the prenominal relatives observed in the bilingual children's English are restricted to object relativisation, counter to the Noun Phrase Accessibility Hierarchy (Keenan and Comrie 1977) which would predict that a language or interlanguage allowing object relatives will also allow subject relatives. We shall attribute this unusual phenomenon to the isomorphism between object relatives and main clause word order in Cantonese, which facilitates processing and production of this kind of relative clause.

In the subsequent stage of development, postnominal relatives are produced which are characterised initially by the occurrence of resumptive pronouns. Such resumptive pronouns are also observed in the acquisition of English as a first language by monolingual children (Pérez-Leroux 1995) and as a second language by adult learners from different L1 backgrounds, and we shall suggest that they reflect a universal strategy for relative clauses, rather than transfer (cf. Hyltenstam 1984, Gass and Ard 1984). The two stages of development suggest that both transfer and universal factors are crucial in accounting for early bilingual development.

We shall begin by reviewing background issues including syntactic transfer in children who are simultaneously exposed to two languages, the universally marked status of prenominal relatives, and the structure of relative clauses in adult Cantonese. Section 2 reviews the methodology of the study, giving information on the subjects and data collection. Section 3 describes the development of relative clauses in the two subjects' English and Cantonese. Section

4 discusses internal and external factors which may lead to transfer of prenominal relatives from Cantonese into English, followed by conclusions in section 5 highlighting the findings of the study.

1.1. Syntactic transfer in bilingual development

A major theme of research in bilingual acquisition has been the question of one unitary system versus two differentiated systems in children who are exposed simultaneously to two languages. Recent studies agree that bilingual children are able to differentiate between the two languages from early on (De Houwer 1990; Genesee 1989; Genesee, Nicoladis, and Paradis 1995; Meisel 1989) but the picture with regard to transfer remains more mixed. Some studies have suggested that separation of two grammars also implies autonomous development without interaction, hence developing grammars much like those of monolinguals (e.g. De Houwer 1990), while others have found various forms of interaction and cross-linguistic influence between the languages (Döpke 2000, Müller 1998). Thus the development of separate grammars in bilingual children does not preclude cross-linguistic influence; what is at issue is the nature of the influence and whether it constitutes transfer. Here we assume a working definition of transfer as "incorporation of a grammatical property into one language from the other" (Paradis and Genesee 1996: 3).

Concerning the conditions under which transfer takes place, it is often the case that one of the two languages develops faster, or shows greater complexity at a given age. This language is said to be dominant. A number of studies report incorporation of elements from a dominant to a less dominant language (Döpke 1997; Gawlitzek-Maiwald and Tracy 1996; Hulk and van der Linden 1996). Language dominance can be measured most objectively by computing Mean Length of Utterance (MLU) for each language at different stages: the dominant language is expected to have a higher MLU value than the less dominant one. Less direct indications of dominance come from children's language preferences (Saunders

1988). The amount of input from each language is thought to play a major role in determining language dominance (Döpke 1992).

Paradis and Genesee (1996: 3) suggest an important qualification to this view: "Transfer is most likely to occur if the child has reached a more advanced level of syntactic complexity in one language than the other. Such a discrepancy could occur either because it is typical in the monolingual acquisition of the two languages, or because the child is more dominant in one of his or her languages." The first possibility here, whereby the discrepancy between the bilingual child's two languages is in accordance with the normal acquisition schedules for monolingual children in each language, is one which has yet to be investigated extensively. We shall call this the *developmental asynchrony hypothesis*, which we define as follows:

> *Developmental asynchrony hypothesis*: given a property P_a which develops at an earlier stage in monolingual children acquiring Language A than a corresponding property P_b in monolingual children acquiring Language B, in a bilingual child acquiring Languages A and B simultaneously, property P_a is expected to develop in Language A before P_b in Language B. This creates a *developmental asynchrony* between the two languages, allowing property P_a to be transferred to Language B.

On this account, a discrepancy in syntactic complexity between the bilingual child's languages is not necessarily due to dominance. We shall return to this possibility in the case of relative clause development, and its relationship to language dominance, in section 4.1.

1.2. Prenominal relatives as a universally marked option

Prenominal relative clauses appear to represent a marked option in the languages of the world. Overall, there is a strong skewing in favour of postnominal relatives: even OV languages show a slight preference for [N Rel] over [Rel N], while in VO languages, [Rel N]

is "virtually unattested" (Hawkins 1990), with Chinese languages the only extensively documented examples, based on an extensive language sample.[2] Dryer (1992) found that 98% N of VO languages and 58% of OV languages in his sample had postnominal relatives, i.e. there is an overall preference for postnominal relatives. Hawkins (1994) attributes this asymmetry to parsing considerations. The combination of VO order with prenominal relatives creates configurations like the following:

$$[_{VP} \text{ V } [_{NP} \text{ } [_{S} \text{ Relative Clause] N]]}$$

A hypothetical English-based example illustrating this configuration is shown in (1):

(1)   *I* [$_{VP}$ *ate* [$_{NP}$ [$_{S}$ *you bought yesterday*] *the cakes.*]]

With the relative clause [*you bought yesterday*] intervening between the verb *ate* and its object *the cakes*, this configuration incurs an indefinitely long delay in the parsing of NP, and hence also of VP, while the parser awaits the head noun. This delay can be measured using Hawkins' notion of Constituent Recognition Domain:

> *Constituent Recognition Domain* (CRD): The CRD for a phrasal mother node M consists of the set of terminal and non-terminal nodes that must be parsed in order to recognise M and all ICs [Immediate Constituents] of M. (Hawkins 1994: 58).

In the case of (1), VP is a mother node dominating the immediate constituents V and NP. Let us assume that for NP to be recognised, its head N must be parsed. The CRD for VP then extends from V, through the relative clause to the head N:

$$[_{VP} \text{ V } [_{NP} \text{ } [_{S} \text{ Relative Clause] N]}$$

Constituent Recognition Domain for VP

The longer and the more complex the prenominal relative clause in this VO configuration, the longer the CRD and the lower the parsing efficiency achieved by the configuration (some experimental evidence for this is provided by Matthews and Yeung, 2001). The combination of word orders exemplified by (1) is predicted to be strongly dispreferred, as is borne out by Dryer's (1992) statistics cited above, and must be regarded as a marked option in universal terms. Transfer of prenominal relatives in the acquisition of a VO language such as English would create an interlanguage with the anomalous combination of SVO basic word order and [Rel N] order, as instantiated in Chinese. We shall see that this can indeed occur, at least in early bilingual acquisition. To the extent that marked structures are not expected to undergo transfer (a common assumption in second language research, cf. Braidi 1999), the systematic transfer of prenominal relatives comes as a surprise. In section 4 we shall suggest a number of factors which might explain this finding.

1.3. Prenominal relatives in adult Cantonese

In order to establish the transfer basis of the prenominal relatives in the bilingual subjects' English, we need to consider the properties of the corresponding structures in adult Cantonese. Cantonese employs prenominal relative clauses as in (2), where the modifying clause precedes the head noun *saam1* 'clothes', whereas in English it follows the head noun *clothes* as in (3):[3]

(2)   [[*Ngo5 zung1ji3 _ s*] *go2*   *di1 saam1* NP] *hou2 gwai3.*
      I   like   those CL clothes   very expensive
      'The clothes I like are expensive."

(3)   [NP *The clothes* [CP *(that) I like _ *]] *are expensive.*

The type of relative clause in (2) uses a demonstrative *go2* 'that' and classifier *di1* but no overt marker of relativisation or subordination. Termed "classifier relatives" in Matthews and Yip (1994), these

structures are characteristic of spoken Cantonese, as opposed to Mandarin and written Chinese, and hence represent the predominant type of relative clause in the language input addressed to young children. A notable property of object relatives of this type is that they resemble a main clause. Thus the relative clause in (2) has, at least superficially, the same form as the main clause in (4):

(4)   [$_S$ *Ngo5 zung1ji3   go2   di1   saam1*.]
      I   like   those CL   clothes
      'I like those clothes.'

As we shall see, this resemblance has a number of implications. Methodologically, it means that Cantonese relatives with an object gap like (2) and their transfer-based counterparts in English are not easy to identify in the child data, since they will resemble main clauses in having the same linear order; theoretically, it raises the possibility that children could use such relative clauses without having to acquire any subordination strategies.[4]

From a typological perspective, the parallel between object relatives and main clauses raises the possibility that "classifier relatives" such as (2) are internally headed relative clauses: that is, constituents having internally the syntax of a clause but externally that of a Noun Phrase (cf. Keenan 1985: 161):

(5)   [$_{NP/S}$ *Ngo5 zung1ji3   go2 di1 saam1*]   *hou2 gwai3.*
      I   like   those CL clothes   very expensive
      'The clothes I like are expensive.'

When such an analysis is pursued for adult Cantonese, a number of problems arise (Matthews and Yip, 2001). While the simplest type of object relative as in (2) resembles a main clause, evidence from a number of more complex constructions shows that the main clause and relative clause structures are not in fact parallel. In the double object construction, for example, the main clause V-DO-IO order as in (6) cannot be used in a relative clause (7) where the head *syu1* 'book' would be internal to the relative clause:

(6)   [s *Ngo5*   *bei2* *go2*   *bun2* *syu1* *lei5*]
         I   give that   CL   book   you
        'I gave you that book.'

(7)   *[NP *Ngo5*   *bei2 go2*   *bun2* *syu1* *lei5*] *hou2*
         I   give that   CL   book   you   good
   m4   *hou2* *tai2* *aa3?*
   not   good   read   PRT
   'Is the book I gave you good?'

Instead, the relative clause based on (6) requires the head to be in final position as in (8):

(8)   [NP *Ngo5*   *bei2* *lei5* *go2*   *bun2* *syu1*] *hou2*
         I   give you that   CL   book good
   m4   *hou2* *tai2* *aa3?*
   not   good   read   PRT
   'Is the book I gave you good?'

Similarly, the head-internal analysis would predict that the object of an SOV pretransitive construction with *zoeng1* (the Cantonese counterpart to Mandarin *ba*) can be relativised to create a head-internal relative. The result is not grammatical, however:

(9)   *[*Ngo5*   *zoeng1*   *di1*   *syu1*   *bun1* *zau2*]
       I   displace   CL   books move away
   lei5 *baai2* *hai2* *bin1dou6*   *aa3?*
   you   put   at   where   PRT
   'Where did you put the books I moved away?'

Finally, such an analysis would also be inapplicable to subject relatives, where the word order is clearly not that of a main clause:

(10)   [NP *Ting1jat6* *jin2-gong2*   *go2*   *go3*   *jan4*]
        tomorrow   perform-talk   that   CL   person

ceot1-m4-ceot1meng2   *gaa3?*
famous-not-famous   PRT
'Is the person who's giving the talk tomorrow famous?'

While the analysis of classifier relatives as internally-headed relative clauses may not be tenable for adult Cantonese beyond the case of simple object relatives such as (2), these are precisely the structures which appear in the child data. The possibility therefore remains open for child language. Moreover, the identity of the typical object relative with a main clause may facilitate parsing and production of object relatives. This possibility is discussed further in section 4.3 below.

2. Methodology

The data for this study come from longitudinal case studies of two siblings. The longitudinal data form part of the Hong Kong Bilingual Child Language Corpus, and are available at the CHILDES database.[5] These transcript data are supplemented by diary data recorded by the parents.

In this section we review the background of the subjects and the methods used in data collection. The functions of relative clauses in the subjects' diary data will be addressed, followed by a discussion of measuring dominance by means of comparing MLUw in Cantonese and English.

2.1. Subjects and data collection

The subjects of the present case study are the first two children of the co-authors, the mother being a native speaker of Hong Kong Cantonese and the father of British English. Timmy is the first-born son, Sophie the daughter born 2 years and 9 months later. Both children were exposed to Cantonese and English regularly from birth. The family lives in Hong Kong and follows the one parent-one lan-

guage principle when addressing the child. The language between the parents is mainly Cantonese, with frequent code-mixing, as is characteristic of the speech of Hong Kong middle class families. Despite the one parent-one language principle, the quantity of input from the two languages is by no means balanced: on the whole, the children had more Cantonese than English input in their first three years. The language of the community is Cantonese, while the children's extended family (the maternal grandmother and relatives) also speak Cantonese, and in some cases Chiu Chow.[6] Timmy attended a bilingual kindergarten from age 2;4 for three hours a day, with approximately equal amounts of input from each language; from 3;4, he attended a Cantonese-medium kindergarten in the morning and an English-medium kindergarten in the afternoon. Sophie attended a Cantonese-medium kindergarten from 2;06, and from 3;02 also attended an English kindergarten in the morning. At home, regular input in English came solely from the father and the family's Filipino domestic helper, while other English-speaking relatives visited only occasionally.[7]

The children's language development was investigated using (a) longitudinal recordings, and (b) diary data, which provide almost the entire corpus for the present study of relative clauses. The longitudinal data come from a bilingual corpus created by regular audio (and in Sophie's case, video) recording over a period of two years. The researchers sought to reproduce the one person-one language approach in the elicitation environment by having one of the two research assistants involved in each recording session responsible for speaking each language, though English was a second language for all the assistants. Spontaneous speech data were recorded at the subject's home where the routines included activities such as playing with toys and telling stories. These speech data were transcribed by the research assistants.

Following a long tradition in bilingual acquisition research, the parents kept their own record of the two children's language development in the form of diary entries. The availability of diary data enables us to address the development of phenomena such as relative clauses which appear rarely, if at all, in the longitudinal corpus

data. The diary was kept from 1;03-6;00 for Timmy and 1;06-5;06 for Sophie. The diary includes several entries per week and was intended to complement the audio-recording data. Both parents were involved in recording the data in the two languages, although the coverage of English data was more extensive than for Cantonese. The contexts of these data were mostly interaction between the child and parents at home or occasionally away from home. Relevant contextual information was given as far as possible in the diary entries. We believe that the diary data are reliable to the extent that they are systematic: all the patterns described here are instantiated at least three times, and frequently more. Such recurrent patterns imply developing competence rather than performance alone. How representative the diary data are presents a more serious problem: there is inevitably selection bias, whereby unusual and non-native-like utterances are more likely to be recorded than unremarkable and well-formed ones.

2.2. Functions of relative clauses in the diary data

A striking finding is that while we have not identified any clear examples of relative clauses in the longitudinal recordings, there are some 25 clear cases in the diary data for Timmy from age 2;07 to 4;05, most of which are cited in the body of this paper. For Sophie, there are some 60 examples in the diary data between age 3;03 and 5;05. The diary data therefore provide almost the entire corpus for the present case study.

The lack of clear exemplification of relatives in the longitudinal recording, compared to their regular occurrence in the diary data, calls for explanation. It might be argued that relative clauses are merely a low frequency structure and the regular recording time is not sufficient for such structures to occur naturally. However, the corpus for Timmy contains a total 85 files, each representing approximately half an hour's speech in each language, making a total of around 40 hours of transcribed speech. A more likely explanation involves the discourse functions of relative clauses. In speaking to

their parents, the children use relatives to identify objects on the basis of shared knowledge, typically involving family members and activities. A typical example is (11) where Timmy is looking for a water pistol given to him by "Santa Claus" at a Christmas family lunch:

(11)   *Where's the Santa Claus give me the gun?* (2;07;05)

In this utterance, the toy gun is identifiable to the parents, who were present at the Christmas lunch, but not to the research assistants conducting the recording who visited the children at most once per week. The research assistants have a relatively small repertoire of knowledge and experiences shared with the child, hence the opportunities for the child to use relative clauses for purposes of identification are limited. The children's spontaneous production of relative clauses is thus heavily dependent on shared knowledge.

2.3. Measuring dominance: MLUw

We take Mean Length of Utterance (MLU) to be the most objective indicator of a child's linguistic development in each language, and hence of language dominance. The calculation of MLUw (Mean Length of Utterance measured in words) depends on decisions regarding what constitutes a word – a problem which has not been resolved, either in general or with regard to Chinese in particular. Our MLUw calculations depend on the word divisions as made in the transcripts, which are in turn modelled on Matthews and Yip (1994).[8]

While useful for within-language comparisons, it is recognised that MLUw may not be directly comparable across languages, especially those of different morphological types (cf. Döpke 1998: 564). We suggest two responses to this problem. Firstly, Cantonese and child English can both be treated as predominantly isolating languages, since in young children's English (and especially that of our subjects) inflectional morphology is not yet fully in place. Secondly,

MLUw differentials between a bilingual's two languages can be used in a relative, rather than an absolute sense: to compare individual bilingual children with each other, and to show changes in dominance patterns over time. In this way, we find that the mean MLUw for Timmy is 3.46 for Cantonese (based on 34 files from 2;00;26 – 3;06;25) and 3.065 for English (based on 38 files from 2;01;22 – 3;06;25), with the discrepancy especially great in the period 2;01 to 2;08. Taken at face value, this suggests that Cantonese developed faster than English, especially in the period 2;01 to 2;08, while after age 2;09 the MLUw figures are closely matched. Given the uncertainty concerning comparability of MLU across languages, this pattern allows for a number of possible interpretations (Yip and Matthews, 2000: 198). The most plausible interpretation, however, is that the MLUw differential between the two languages indicates Cantonese to be dominant, at least in a relative sense (during the period when prenominal relatives appear, i.e. around age 2;07 in Timmy). For Sophie, the differential in mean MLUw is even greater, and more consistent over the entire period of study: 2.586 for Cantonese, compared with 1.885 for English (based on 40 files for each language from 1;06;00 – 3;00;09).

3. Development of relative clauses in the bilingual subjects

The data show two distinct stages in development of English relatives. In the first stage, prenominal object relatives emerge based on a Cantonese pattern. In the second, postnominal relatives appear, initially with resumptive pronouns. Relative clauses in the children's Cantonese data are essentially target-like throughout, showing no apparent influence from English.

3.1. Prenominal relatives in Timmy's English

As recorded in the diary data, prenominal relative clauses emerge in Timmy's English at age 2;07:

(12)   *Where's the motor-bike? You buy the motor-bike? That you
        buy the motor-bike. Where's you buy that one, where's you
        buy that one the motorbike?* (2;07;03)

In this example, the utterance *You buy the motor-bike* is not to be
interpreted as a full main clause ("Did you buy the motor-bike?"), as
this interpretation would be incompatible with the following lin-
guistic context (*Where's you buy that one?*) as well as the extra-
linguistic context, in which the child is looking for a certain toy.
Rather, the utterance is intended as a relative clause ("the motorbike
that you bought") being used to specify reference to a particular toy.
The structure for (12) therefore follows the Cantonese prenominal
pattern described in (2) above, as shown in (13):

(13)   *Where's* [[*you buy* _ s] *that one* NP],
        where's [[*you buy* _ s] *that one the motorbike* NP]

Similarly in (14), where comprehension of the relative depends on
the addressee's knowledge that uncle Patrick (alias Pet-Pet) bought a
certain videotape for the child:

(14)   *I want to watch videotape. Butterfly. Patrick buy that one.
        I want Pet-Pet buy that one videotape.* (2;11;25)

Here the utterance *Patrick buy that one* is not to be interpreted as a
main clause ("Patrick bought that one"), but a relative clause ("the
one that Patrick bought") being used to specify a particular video-
tape. Similarly, *I want Pet-Pet buy that one videotape* cannot mean
"I want Pet-Pet to buy that videotape", because the tape concerned
has already been bought.

In examples such as (12) and (14) we can see how the child ex-
pands a headless relative with *one* into a head-final one by adding a
head noun. In (15), the child replaces *that* with the lexical head noun
tape:

(15)   *This is who buy? Have butterfly? You bought that have but-*
       terfly?
       [referring to a new video tape with a butterfly on the cover]
       [later] *You buy that tape is English?*   (2;10)

Here the child's last question, concerning the same videotape, uses a full relative clause with *tape* as the head noun. Note that the demonstrative *that* appears regularly. As in Cantonese relatives such as (2) illustrated above, this has the force of a definite rather than a deictic determiner (i.e. the distal/proximate distinction is neutralised in this context). The corresponding adult Cantonese relative, as in (16), has the demonstrative *go2* 'that' followed by the classifier *beng2*:

(16)   *Lei5   maai5 go2   beng2 daai2 hai6   Jing1man2 ge3.*
        you   buy   that   CL   tape   is   English   PRT
       'The tape you bought is English.'

In the child's English, *one* serves a generic classifier as in example (14) above. This pattern is more extensively attested in Sophie's English (see 3.3 below).

3.2. Prenominal relatives in Timmy's Cantonese

Cantonese relative clauses are recorded in Timmy's diary data during the very same week in which prenominal relatives appear in English, the first example being (17):

(17)   *Jan   maai5 go2   tiu4*
        Jan   buy   that   CL
       'The one that Jan bought' (2;07;04)

This is a classifier relative of the type described in section 1.3 above, with the classifier *tiu4* denoting an elongated object (in this case a pair of pants) but the head noun is omitted, as in *Patrick buy that one* (14). Subsequent examples include a head noun, as in (18):

(18)   *Po4po2*   *maai5 di1*   *tong4-tong2*   *ne1*?
        Grandma   buy   CL   candy-candy   PRT
        'What about the candies Grandma bought?' (2;7;12)

One Cantonese example (19) not only exhibits similar structure to those already described in Timmy's English, but refers to the very same referent as the English example (11) above:

(19)   *Santa Claus*   *bei2*   *lei5*   *go3*   *coeng1*   *le1*?
        Santa Claus   give   you   CL   gun   PRT
        'Where's the gun Santa Claus gave me?' (2;8;25)

Here the child appears to use the default classifier *go3* (adult Cantonese would use both *go2* 'that' and a more specific classifier, either *zi1* or *baa2* for *coeng1* 'gun', while the pronoun *lei5* 'you' is a case of pronoun reversal (the child clearly intends reference to himself, so that the target is *ngo5* 'I'). By age 2;10 we see fully well-formed classifier relatives:

(20)   *Go2*   *di1*   *Lego*   *le1,*   *Mannings*   *maai5 go2*
        that   CL   Lego   PRT,   Mannings   buy   that
        di1   *Lego*   *le1*?
        CL   Lego   PRT
        'What about the Lego, the Lego we bought at Mannings?' (2;10;14)

In structure, function and even topic (cf. the 'Santa Claus') the Cantonese relatives parallel the English examples such as (11-15) discussed in section 3.1. Given the simultaneous emergence and productive use of prenominal relatives in both languages, the role of transfer in the English examples can be established.

3.3. Prenominal relatives in Sophie's English

Prenominal relative clauses appear rather later in Sophie's English, at around age 3;03. This relative delay is expected since Sophie began to produce Cantonese at 11 months and English only at around age 2. One implication of this timing is that Sophie's production of prenominal relatives cannot readily be attributed to input from the elder sibling. At the time when Timmy was producing them (up to age 4) Sophie was between 1 month and 1;03, well before she had begun to produce English sentences. The development of prenominal relatives in her English can therefore be considered independent, and the strikingly parallel paths taken by both children can be seen as the product of interaction of English and Cantonese grammars under similar input conditions.

Between ages 3;03 and 4;03, Sophie produces only relatives headed by *one*, without a lexical head noun:[9]

(21)   Child: *Timmy take that one, I want.*
        Father: *Which one do you want?*
        Child: *She take that one. Timmy take that one.* (3;03;12)

(22)   Child: *I also want.*
        Father: *What do you want?*
        Child: *Timmy said that one.*
        [the child has been asking for a piggy-bank] (3;08;21)

(23)   *I want have ear-ear that one*
        [wanting to wear a coat that has ears] (3;10;9)

(24)   *Daddy, I want ice-cream. Carmen eat that one.* (4;01;11)

(25)   *I buy in the store that one is yummy.*
        [Talking to her brother about lemon sweets] (4;03;17)

With *one* serving as the head, these are based on the "headless" Cantonese construction with demonstrative and classifier but no

head noun, as in Timmy's (16). The adult Cantonese counterpart of *Timmy said that one* in (22) is shown in (26):

(26)   *Timmy*   *waa6*   *go2*   *go3*
        Timmy   say   that   CL
        'The one Timmy talked about'

The structure with *one* can be expanded into a full-fledged relative clause by adding a head noun, as we saw in the case of Timmy's (11-13). Instead of this, Sophie replaces *one* with a head noun, as subsequent examples show:

(27)   Father: *Which dress?*
        Child: *The... you take for me that one.*
            ...Where is it, you said it that dress? (4;04;20)

Here the two relative clauses used to specify the same dress are revealing: the first has *one* as the head, while the second has *that dress* as the head, as well as a resumptive pronoun *it*. Here the context confirms that *you said it that dress* means "the dress you mentioned", as the father had recommended a certain dress to go with her gloves and shoes (cf. the use of the verb *waa6* 'say' in (26) above).

Similar examples of headless relatives to those in Sophie's English are attested in Singaporean children's English (Gupta, 1994). These children are exposed to a variety of Chinese languages including Mandarin, Cantonese, Hokkien and Teochew (Chiu Chow), and in some cases also Malay, alongside English. The English of Gupta's subjects is strikingly similar to what we have observed in our Hong Kong bilingual subjects: although the sociolinguistic situations differ considerably, the influence of southern Chinese dialects through transfer and as substrate languages results in similar effects on the structure of English. In particular, we find relative clauses with *one* as a pronominal head:

(28) *My this can change one ah.*
      'Mine is the sort that can change'(Child EB, 5;11, Gupta 1994: 90)

Such examples are (to say the least) not immediately recognizable as relative clauses. Alsagoff and Ho (1998: 134-135) describe similar headless relative clauses in adult Colloquial Singapore English (CSE):

(29) *They grow one very sweet.*
      'The fruit that they grow is very sweet.'

(30) *Don't have car one, I don't want.*
      'I don't want [a man] who does not own a car.'

Here *one* appears as a clause-final relative marker. When extended to include a lexical head, however, the relative clause is typically postnominal:

(31) [NP *The fruit they grow one*] *very sweet.*

(32) [NP *That boy pinch my mother one*] *very naughty.*

In the authors' analysis, these relative clauses in Colloquial Singapore English "show an amalgamation of both substrate (i.e. Chinese) and superstrate (i.e. English) grammatical features" (Alsagoff and Ho 1998: 127). The substratal influence manifests itself in the use of *one* as a relative marker linking the relative clause to the nominal head. This use of *one* is argued to arise through calquing of the Chinese nominaliser (Mandarin *de*, Hokkien *e*, Teochew *kai*, etc.) into English. This analysis is not directly applicable to our subjects, whose grammar is influenced specifically by the Cantonese classifier relative as illustrated in (2) above. In our subjects *that one* corresponds to the Cantonese demonstrative + classifier complex: *go2 go3* as in (33).

(33)   [NP *Lei5*   *bei2*   *ngo5*   *go2*   *go3*]
          you   give   me   that   CL
        'The one you gave me'

Despite the superficially similar use of *one* as clause-final relative marker, then, the Singaporean data differ from our child data in:

(i)   the position of the relative clause (postnominal in the Singaporean case vs. prenominal in ours), and
(ii)   the source structure (nominaliser in the Singaporean case vs. classifier in the Hong Kong data).

3.4. The emergence of postnominal relatives and resumptive pronouns

Between prenominal relatives and the eventual emergence of target-like postnominal relatives, we see an intermediate stage in which relatives are produced in postnominal position, with the target word order but with resumptive pronouns. At the beginning of this stage there is overlapping of the pronominal and postnominal types. The last prenominal relatives produced by Timmy are recorded around age 4:

(34)   *Daddy, I want the water gun, the Santa Claus give me that water gun.* (3;11;12)

(35)   *Actually I like the best game is Tetris.* (4;00;15)

(36)   *Daddy, which that you record tape?* (4;02;25)
        [asking which tape is the one Daddy recorded]

When postnominal relative clauses begin to appear in Timmy's English, no relative pronoun or complementiser is used, but resumptive pronouns are employed. The first example of this type in Timmy's data is recorded at 3;04:

(37)   *It's like the one you bought it.* [seeing picture of toy car]
        It's not like the one you bought it. [seeing difference]
        (3;04;07)

There is the possibility of transfer here, since Cantonese allows re-sumptive pronouns in positions below subject on the NP Accessibil-ity Hierarchy of Keenan and Comrie (1977). In the case of object relatives the pronoun is not used in simple clauses (38), but optional in more complex ones such as (39) where there is a complementa-tion structure in the relative clause (cf. Yip and Matthews 2001: 123):

(38)   *Ngo5   ceng2   (*keoi5dei6)   go2   di1   pang4jau5*
         I   invite   (*them)   those CL   friend
        'Friends that I invite'

(39)   *Ngo5   ceng2   (keoi5dei6)   sik6-faan6   go2   di1*
         I   invite   (them)   eat-rice   those CL
        pang4jau5
        friend
        'Friends that I invite to have dinner'

However, there are several reasons to believe that the appearance of resumptive pronouns in the child's English is *not* due to transfer:

(a) while in adult Cantonese the resumptive pronouns are restricted to animate nouns as in (39), in the child data they are used to refer to inanimate nouns as in (40):

(40)   *I want the sweet, the sweet that you put it there yesterday.*
        (4;00;03);

(b) unlike in Cantonese, resumptive pronouns are occasionally used by Timmy even in the subject position of relative clauses:

(41)   *Daddy where's the thing?*
        Where is the thing it hangs? The one it says one for me, one
        for Sophie?   (3;10;23)
        [looking for coat-hangers with the children's names painted
        on them];

(c) the children's Cantonese does not show resumptive pronouns in either subject or object position of relative clauses (cf. the examples in 3.2 above);

(d) the children's English does not show resumptive pronouns when the relative clauses occur in prenominal position (with the single exception of (27)), as would be expected if this property were subject to transfer from Cantonese.

These considerations lead us to conclude that the resumptive pronouns observed in our subjects instantiate a universal developmental strategy rather than transfer. Such resumptive pronouns are known to be widely used in second language acquisition by learners regardless of L1 language backgrounds (Hyltenstam 1984, Gass and Ard 1984).

In Sophie's English, resumptive pronouns are again observed in object position when postnominal relatives first appear:

(42)   *I got that red flower dress that Jan give it to me.* (4;10;28)

(43)   *This is the homework that I do it. But, I done already at*
        school. (4;11;04)

No cases are recorded of resumptive pronouns with subject relatives in Sophie. This may be because she uses the complementiser *that* regularly. In English, subject relatives require *that* in order to distinguish the subordinate structure from a main clause. Compare example (41) from Timmy, repeated as (44), with the subject pronoun *it* but without *that*:

(44)   *Where is the thing it hangs? The one **it** says one for me, one for Sophie?* (3;10;23)

In the absence of the complementiser *that*, the resumptive subject pronoun *it* serves to mark the relative clause status, since without it the string [*the one says...*] would be indistinguishable from a main clause.

More generally, the rarity of resumptive pronouns in subject relatives is consistent with the status of subject relatives at the top of the Noun Phrase Accessibility Hierarchy, and hence universally less likely to exhibit resumptive pronouns (Keenan and Comrie 1977, Hawkins 1999). In a picture description task eliciting relative clauses from 11 children from 3;05 to 5;05, Pérez-Leroux (1995) did not find any resumptive pronouns in more than one hundred subject relative clauses, while resumptive pronouns did appear in relative clauses with relativised object and object of preposition.

3.5. The transition from prenominal to postnominal relatives

Both children exhibit transitional structures during the shift from the prenominal to postnominal stage. In Timmy, such a transitional case is (45):

(45)   *But some children buy the boat **it** stands.* (4;1;2)

At least two possible analyses present themselves for this utterance:

(a) a prenominal relative with *the boat* as its head, followed by a coreferential subject pronoun as in left-dislocation:

(45a)   *But* [NP *some children buy* [NP *the boat*]] [S *it stands*]
          'But the boats that some children buy, they stand up.'

(b) a postnominal relative with resumptive pronoun in subject position:

(45b)   *But some children buy* [NP *the boat* [S *it stands*]]
        'But some children buy boats which stand up.'

At this age, when Timmy uses both prenominal relatives (34-36) and postnominal ones (37, 40-41), example (45) is genuinely ambiguous.

In Sophie, different transitional structures are observed in the period of transition from prenominal to postnominal relatives. One is the introduction of the complementiser *that* in the prenominal relative:

(46)   *Where is that 'mou tiu', that Mummy wrote that paper?*
        (4;09;08)

(47)   *Daddy, I haven't got that Mickey Mouse, that Chloe gave me that one.* (5;04;24)

In these examples we seem to have three distinct occurrences of *that*:

(a) demonstrative *that* (*that mou tiu, that Mickey Mouse*)
(b) complementiser *that* (*that Mummy wrote, that Chloe gave me*)
(c) a restrictive use of *that* (*that paper, that one*) corresponding to the demonstrative *go2* in Cantonese classifier relatives such as (2) above.

While in adult speech the complementiser usage would be distinguished by reduction of the vowel to schwa, in Sophie's speech these uses of *that* are pronounced alike, suggesting that she has yet to distinguish the complementiser from the demonstrative usage.

Another transitional example is (48):

(48)   *Where's just now that one I give you?*
        [looking for a puzzle done by her father] (5;04;22)

Here the adverbial *just now* belongs semantically in the relative clause, but comes before the head, as if the child begins to construct

a prenominal relative [*Where's just now I give you that one*] but then thinks better of it and postposes the remainder of the relative clause.

A second transition can be observed from the resumptive pronoun strategy to the target gap strategy. Relative clauses using a gap strategy appear shortly before Timmy's fourth birthday; these are ill-formed in the case of subject relatives (49) but target-like in the case of object (50) and prepositional relatives (51-52):

(49)   *Daddy, do you know where is the thing goes here?* (3;10;25)

(50)   *I want to build the car we saw in Mannings.*
         I want to build the one we saw in Mannings. (3;10;30)

(51)   *Daddy, where's the gun you put water in?* (3;11;01)

(52)   *Daddy, we go to the shop we haven't been to, the mall inside the shop*
         [i.e. the shop inside the mall] (4;00;04)

Following the well-formed gap relative [NP *the shop we haven't been to*] in (52), we note the resurgence of the prenominal modification construction: *the mall inside the shop* meaning 'the shop inside the mall' (see 4.2 below).

When the complementiser *that* appears at age four, resumptive pronouns are used sporadically, for example in sentences with the verb *put*:

(53)   *I want the sweet, the sweet that you put **it** there yesterday.* (4;00;03)

(54)   *Where is the thing that I just put here?* (4;01;29)

(55)   *Where is the thing that put inside? Where is the thing that go inside?* (4;1;30)

A similar shift away from resumptive pronouns is seen in Sophie, though at a slightly later stage than in Timmy (who made the shift around age 4). As we have seen, Sophie began to produce postnominal relatives shortly before age 5, initially with pronouns in object position as seen in (42) and (43). One month later similar object relatives appear without the pronouns:

(56)   *Thank you for the dress that you give to me, for the dolly.*
        (5;00;04)

(57)   *Hey, this is the clips that Belma buy.* (5;00;05)

Pronouns reappear in more complex structures, such as an object of an embedded clause within a relative clause:

(58)   *Daddy, where's the fox hole, that you said you find it yesterday?* (5;04;15)

The use of the pronoun here does recall our Cantonese example (39). Such examples are also explainable on universal grounds, however. Compare a similarly complex example from Timmy, in which the pronoun occurs twice in a coordinate construction:

(59)   *I need the train that you push it and it goes.*
        'I need the train that goes when you push it.' (4;03;09)

In this case the pronouns might be used even in adult English: "English gaps in complex NP environments can some times be rescued by pronoun retention" (Hawkins 1999: 265).

Perhaps appropriately, one of Sophie's first fully well-formed relatives was produced during a visit to Oxford (60), followed by a number of well-formed examples:

(60)   *Then we buy that lipstick that you want*
        [shopping in Oxford, England] (5;04;19)

(61)   Father: *You want to choose something?*
        Child: *Choose something that I want to eat.* (5;04;20)

Sophie has thus reached the target English relative clauses at age five, as Timmy did at age four. Both children have, however, reached it by a very different route from a monolingual child. In Mckee, McDaniel and Snedeker's (1998) experimental study of 28 monolingual English subjects between 2;02 and 3;10, 80% target relative clauses were produced by the subjects, while occasional errors involved resumptive pronouns (62) and non-target relative pronouns such as *what* (62) and *why* (63) (Mckee et al. 1998: 586-587, emphasis added):[10]

(62)   Strawberries – *pick those two up **what** the dinosaur is eating **them**.* (CT, 2;10)

(63)   Bicycle – *pick this one up **why** Dorothy's riding.* (CT, 2;10)

Mckee et al. (1998: 589) suggest a performance account of the resumptive pronouns on the grounds of their sporadic appearance and processing demands, just as in the case of resumptive pronouns in adult English. However, the productive use of resumptive pronouns in our bilingual subjects' production data argues for a grammar that systematically generates resumptive pronouns in relative clauses at this transitional stage.

3.6. The absence of wh-relatives

One final observation to note is the absence of *wh*-relatives in the English data in the period concerned. While monolingual children acquiring English use *wh*-relatives extensively (and indeed misuse them, as in 62-63), the postnominal relative clauses produced by Timmy are overwhelmingly *that*-relatives or zero-relatives, with wh-relative pronouns essentially absent from both the longitudinal recordings and diary data. This again matches findings for Singapor-

ean children who are observed to produce only *that*-relatives (Gupta 1994: 90) and more generally the finding that *that*-relatives predominate over *wh*-relatives in English interlanguages and emerging Asian varieties of English (Newbrook, 1999; Gisborne, 2000). This is attributable in part to the lack of *wh*-relatives in the Asian languages which act as substrates in these new Englishes. Moreover, the invariant form of *that* makes it a straightforward relative marker for a learner to use, whereas in *wh*-relatives the form of the relative pronoun varies with animacy, etc. Register may also be an important factor here: the colloquial spoken English addressed to our children contains largely *that*-relatives.

One example of an apparent *wh*-relative does appear in Timmy's data:

(64)   *The one who breaks is the not-winner.*
        [playing with toy trains] (4;10;16)

Although (64) looks superficially like a *wh*-relative, it is in all probability a quite distinct construction, based on a Cantonese one as in (65) which does use a *wh*-word, *bin1go3* 'who':

(65)   *Bin1go3*   *zing2*   *laan6*   *zau6*   *syu1.*
        who   makes   broken   then   loses
        'Whoever breaks [it], loses.'

The structure in (65) is treated as a free relative in Matthews and Yip (1994: 113). To the extent that the only apparent examples of wh-words in relatives are such free relatives, the child's example (64) may owe more to this Cantonese construction than it does to English *wh*-relatives. A series of utterances produced by Sophie conclusively demonstrates transfer of such free relatives with *wh*-words:

(66)   [entering apartment] *I bath! I always come back I bath.*
        Who bath tomorrow can go in...
        [makes bed]

Who want to sleep over here, then you can sleep.
If who want to sit on this, you can.
Daddy, you can sit on this thing, if you like. (5;01;03)

As Sophie's paraphrases with *if* show, the construction has an implicitly conditional function, which is characteristic of the Cantonese construction as in (65).

4. Discussion

We now discuss factors involved in the transfer of prenominal relatives. One set of factors is external – the dominance of Cantonese over English in our subjects, which in turn derives from the less-than-balanced input conditions described in section 2.1 above. Another set of factors involve typological characteristics of Cantonese – the relationship of relative clauses to other prenominal modification structures, and the resemblance between object relatives and main clauses.

4.1. Language dominance and developmental asynchrony

The period of transfer of prenominal modification structures in Timmy begins at age 2;07, during a period (2;00 – 2;10) in which the MLUw for Cantonese utterances is markedly ahead of that for English. Moreover, there is relatively little evidence of transfer from English to Cantonese in either child. Together, these findings implicate dominance of Cantonese as a causal factor. Yip and Matthews (2000) discuss other aspects of syntactic transfer in Timmy, including *wh*-in-situ (67) and null objects, as in (68):

(67)   *It is for what?* (2;05)

(68)   Adult: *Where shall we stick it?*
        Child: *Put here.* (2;05;05)

The occurrence of these structures is shown to be qualitatively and quantitatively distinct from that found in monolingual development. The occurrence of *wh*-in-situ and null objects peaks during the period when Timmy's MLUw for Cantonese is most clearly ahead of that for English, suggesting a close relationship between direction of transfer and language dominance.[11] In the case of Sophie, dominance of Cantonese is clearer still, based on indicators such as MLUw differential (see 2.3 above) and first use of Cantonese and English (cf. 3.3 above).[12] Language dominance must therefore be considered a major factor favouring transfer from Cantonese to English.

In section 1.1, however, we entertained another possibility raised by Paradis and Genesee (1996), which we formulated as the developmental asynchrony hypothesis. In the case of transfer at issue here, it is possible that Cantonese monolingual children's prenominal relatives in general develop earlier than English monolingual children's postnominal ones. If so, it would also be expected that Cantonese relative clauses would develop before English ones in bilingual children, thus fulfilling Paradis and Genesee's condition for transfer. This would constitute a "developmental asynchrony" in the bilingual child, who would then have reason to transfer the Cantonese structure to English (perhaps as a stop-gap measure or "relief strategy") without dominance necessarily playing a role. Unfortunately we are not able to distinguish between dominance and developmental asynchrony in this case, for two reasons:

(a) the monolingual Cantonese data needed to establish such a baseline for the acquisition of relative clauses are lacking. While corpora for monolingual Cantonese children exist, the rarity of relative clauses in spontaneous production (as noted in 2.2) means that diary and/or experimentally elicited data would be required.

(b) our subjects show clear signs of dominance, so that the effects of dominance and language-specific acquisition schedules could not be distinguished. That is, even if it were established that Cantonese object relatives typically develop earlier than their English counterparts, we would be unable to tell whether such a developmental

asynchrony is responsible for transfer, as opposed to the general dominance of Cantonese, since the predictions of the two factors coincide in our case study. Studies of relatively balanced and English-dominant children, in whom dominance of Cantonese could be excluded, would be needed to test the hypothesis. If transfer of prenominal relatives were indeed observed in such children, the developmental asynchrony hypothesis would be supported.

Finally, we should note that the dominance and asynchrony accounts of transfer are not fundamentally at variance with each other. Dominance essentially means that at a given stage of development Language A is ahead of Language B in overall complexity, while developmental asynchrony refers to the phenomenon whereby specific aspects of Language A are ahead of Language B, for language-specific reasons. The actual mechanisms of transfer could well be the same in each case, i.e. the child has competence in Language A which she lacks in Language B, and some property of Language A is transferred to Language B as an interim strategy.

4.2. Relative clauses and other prenominal modifiers

As we noted in section 1.2 above, Sinitic languages are almost unique in the co-occurrence of SVO basic order with prenominal relatives. Part of the explanation for the exceptional status of Sinitic in this regard lies in the fact that relative clauses follow a consistent pattern of prenominal modification. Indeed, it can be argued that there is a continuum from adjectival modification to relative clauses, with some structures being of indeterminate or intermediate status as between adjectival modifiers and relative clauses. This unity of noun-modifying structures is a typological feature widespread in Asian languages (Comrie 1996). This proves to be a fruitful way of looking at our subjects' relative clauses. Alongside the prenominal relatives, we find PP and other phrasal modifiers in Timmy's data:

(69)   *Where is the tank of the part?* [i.e. the part of the tank] (3;02)

(70)   *Some whales is small. The school in the whale is small.*
        [i.e. the whale in the school] (3;09;19)

There are also examples which might be seen as intermediate between adjectival modifiers and full relative clauses:

(71)   *I like to eat no seeds inside the grapes.* [i.e. seedless grapes]
        (3;09;24)

(72)   *This is a nobody can find me place.* (4;00;19)

The modifying "clause" *no seeds inside* in (71) lacks a verb, while (72) lacks a preposition or other indicator of the spatial relationship between the head noun and the modifying clause *nobody can find me*.

The developmental parallel between relative clauses and other modifiers also finds support in English monolingual development, albeit this time in postnominal position. Tager-Flusberg (1989) describes an experiment in which younger children tended to produce PP modifiers, as in (73), rather than relative clauses (74):

(73)   *The boy gave the dog to* [NP *the bear* [PP *with the wagon.*]]

(74)   *The boy gave the dog to* [NP *the bear* [CP *who is holding the wagon.*]]

Tager-Flusberg concludes:

> Children may be using their knowledge of simpler constructions to guide the acquisition of more complex constructions. In this [elicitation] task both forms, prepositional phrases and relative clauses, fulfil the function adequately, but younger children used primarily simpler prepositional phrases, while older children used primarily relative clauses. Perhaps the developmental roots of relative clauses lie in simpler constructions. This study, using production data, suggests that prepositional phrases are one such possible origin... (Tager-Flusberg 1989: 157)

A particular case of the continuum scenario outlined by Comrie (1996) with regard to Japanese involves prenominal modifying phrases which are clearly clausal (rather than adjectival) and yet not prototypical relative clauses in the sense that there is no grammatical relation between the head noun and the clause; rather, there is a looser relation of association between them, analogous to that which obtains in topic-comment constructions. Such structures are equally possible in adult Cantonese.[13] In (75), for example, the instrumental relationship between *bat1* 'pen' and the predicate *waak6-waa2* 'draw pictures' is unexpressed, while in (76) there is no grammatical relation at all between *soeng2* 'pictures' and *waat6-syut3* 'ski':

(75) *Ngo5   waak6-waa2   go2   zi1   bat1*
      I   draw-picture   that   CL   pen
      'The pen that I draw pictures [with]'

(76) *Lei5   waat6-syut3   go2   di1   soeng2*
      you   slide-snow   those CL   pictures
      'The pictures of you skiing; your skiing pictures'

There is good evidence that the children's developing grammar allows modifying clause of this type, which involve no grammatical relationship between the head and the relative clause. A rare example of a clausal modifier in the longitudinal corpus data for Timmy is (77):

(77) *Co5   feilgei1   go2   di1   ze4ze1   bei2*
      sit   plane   those CL   elder-sister give
      ngo5   gaa3.
      me   PRT
      '(These are) given to me by those ladies on the plane.'
      (3;02;26)

Referring to a toy given to the child by the flight attendants ("big sisters"), this example could in principle be analyzed as a subject

relative ("the ladies who take the plane"), with a gap in subject position as shown in (78):

(78)   [[_ *co5 feilgeil*s] *go2 di1 ze4ze1* NP] *bei2 ngo5 gaa3.*

More plausibly, however, the child means "the ladies associated with taking the plane", in which case the head noun *ze4ze1* 'sisters' would bear no grammatical relation to the predicate *co5 feilgeil* 'sit plane' (meaning to take a plane). Rather, it would be a relationship by way of association, of the kind often found in Chinese topic-comment structures: there would be no gap, and the structure would be intermediate between a relative clause and other premodifying phrases. A similar example is recorded in Sophie's English:

(79)   *The go to Australia things!*
        [pointing to things packed for trip to Australia] (4;03;24)

This example could either be a subject relative ('the things which are going to Australia') or an associative clause ('the things involved in (our) going to Australia'). On the latter analysis, the children would be extending Comrie's "Asian" type of noun-modifying clause to their English. Some later examples from Sophie clearly call for such an "associative" analysis:

(80)   *Where's my medicine? That here painful that one.*
        [pointing to gums] (4;09;11)

(81)   *I want that blue thing, I go to Chinese school that.* (4;11;17)

The relative clause in (80) is intended to mean "the medicine that I use when it hurts here", in which there is no grammatical relation between the modifying phrase *here painful* and *that one* (the medicine). Similarly:

(82)   *How 'bout... I wear the go P.E. shoes, that one.* (4;10;18)

Here *the go P.E. shoes* are clearly not shoes which go to P.E. (Physical Education) lessons themselves, but those which the child wears when going to P.E. lessons. This is not a subject relative, but an associative one of the kind we identified in Timmy's Cantonese (77) and Sophie's English (79).

4.3. Object relatives and parsing

A notable characteristic of the data is that the earliest prenominal relatives recorded, in both English and Cantonese, are object relatives – those in which the head noun functions as the object of the relative clause. As we showed in connection with adult Cantonese (see 1.3), it is precisely in the case of object relatives that the relative clause matches the main clause order. This resemblance has consequences for production and processing:

(i) prenominal object relatives are easily constructed using the canonical word order of a main clause (and possibly the actual structure of a main clause, if the internally-headed analysis as sketched in section 1.3 above is applicable);

(ii) if the child should parse or analyse the relative clause as a main clause, the resulting interpretation will still be similar. Our example (2) above would allow such a conjoined clause interpretation, as shown in (83):

(83) [s *Ngo5*   *zung1ji3*   *go2*   *di1*   *saam1*]
        I   like   those   CL   clothes
      [s *hou2*   *gwai3.*]
        very   expensive
      'I like the clothes (and/but) they are expensive.'

The finding that prenominal object relatives are first to emerge in our bilingual subjects may be compared with English monolingual development in which postnominal subject relatives are acquired

earliest, and also most readily processed under experimental conditions (Tavakolian 1981). Given the combination of SVO and post-nominal relatives, the situation in English is the reverse of that in Cantonese, and it is in subject relatives that the word order matches that of a main clause. As argued by Tavakolian (1981), a relative clause such as (84) can be given a conjoined clause interpretation as in (85):

(84)   *The rabbit [that kissed the duck] is happy.*

(85)   *The rabbit kissed the duck, (and) is happy.*

The account we have given for Cantonese makes a prediction which might be tested experimentally in future work: object relatives in Cantonese should be processed and produced by children more easily than subject relatives.

5. Conclusions

The simultaneous acquisition of Cantonese and English in bilingual children raises possible forms of transfer not seen in other language pairs. The combination of SVO word order with prenominal relative clauses, virtually unique to Sinitic languages, is a case in point. In this study of the development of relative clauses in two Cantonese-dominant bilingual subjects who have been regularly exposed to English and Cantonese from birth, two main findings have emerged. Firstly, prenominal relative clauses in Cantonese prove to be transferable to English. Despite the cross-linguistically marked status of prenominal relative clauses in SVO languages, they readily lend themselves to transfer from Cantonese to English. These prenominal relatives are invariably object relatives, in which the word order resembles that in main clauses, facilitating processing and production of this structure. Secondly, the development of postnominal relatives shows the use of resumptive pronouns in object and occasionally also in subject position. While the prenominal relatives represent a

clear case of transfer, the resumptive pronoun strategy cannot plausibly be attributed to transfer as resumptive pronouns are not attested in the children's Cantonese. To the extent that different groups of learners including simultaneous bilingual children, monolingual English children and adult second learners of English all make use of resumptive pronouns in their production of relative clauses at a certain developmental stage, the resumptive pronoun strategy appears to represent an option universally available to the language learner.

A number of developmental and typological factors conspire together to favour transfer of prenominal relatives in the bilingual subjects' English. The dominance of Cantonese over English, as indicated by the MLUw differential, largely determines the directionality of transfer in the acquisition of relative clauses. The prenominal relatives share important properties with other types of prenominal modification, which surface as interlanguage structures with adjectives and prepositional phrases modifying the head noun. Comrie's (1996) suggestion of a continuum of prenominal modification structures finds developmental confirmation in the parallel development of relative clauses and other prenominal modifiers. In particular, a type of modifying clause instantiated in Timmy's Cantonese and in both children's English involves a kind of association rather than strict grammatical relationship between the head and the predicate in the prenominal modifying clause.

In addition, the prenominal object relatives, though typologically dispreferred in languages with SVO basic order, share the canonical word order of the main clause, which offsets the parsing difficulty of prenominal relatives predicted by Hawkins (1990, 1994). This also explains why only prenominal object relatives are attested in the bilingual subjects' English: prenominal relatives with other relativised positions would not preserve the canonical word order of main clause. The canonical word order proves to be a powerful strategy that overrides the potential difficulty presented by prenominal relatives in a SVO language.

Notes

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1. We use the term "Sinitic languages" for what have traditionally been called "Chinese dialects" in order to reflect the magnitude of structural differences between varieties of Chinese (cf. Chappell 2001).

2. The Tibeto-Burman language Karen, which has switched from SOV to SVO order under the influence of surrounding Tai languages, apparently has prenominal as well as postnominal relatives (Solnit 1997).

3. Cantonese examples are transcribed orthographically in the JyutPing romanisation system developed by the Linguistic Society of Hong Kong. Tones are marked numerically (1: high level, 2: high rising, 3: mid level, 4: low falling, 5: low rising, and 6: low level). Abbreviations used in the glosses are CL for classifier, PFV for perfective aspect and PRT for particle.

4. In theoretical terms, while English relatives have been assumed to be formed by *wh*-movement (in the case of *wh*-relatives) or by null operator movement (for *that*-relatives), Cantonese relatives clearly do not involve such movement. Structures resulting from transfer will thus be qualitatively different from a target relative clause derived by *wh*-movement. In the case of Cantonese adult second language learners of English, Hawkins and Chan (1997) argue that their representation of English relatives involves pronominal binding by a base-generated null topic, rather than operator movement.

5. We are grateful to Brian MacWhinney for making the bilingual corpus available for world-wide access at Carnegie Mellon University. The corpus data are deposited at the CHILDES archive at http://childes.psy.cmu.edu under the heading "bilingual corpora" and include sample transcripts linked to audio and video recordings.

6. Chiu Chow (or Chaozhou), the ancestral language of a sizeable minority in Hong Kong, is spoken in eastern Guangdong province and belongs to the southern Min dialect group. Although diverging from Cantonese in many respects, it shares the broad typological characteristics at issue here, including prenominal relatives. The children have some passive knowledge of Chiu Chow but seldom produce it.

7. The question of what role the Filipino English spoken by the domestic helpers has in the children's language development is a pertinent one. As far as the features discussed in this paper are concerned, we observe that the English of the helpers conforms to standard English: they do not, for example, use prenominal relatives.

8. We use MLUw (mean length of utterance in words) rather than MLUm (mean length of utterance in morphemes). Huang (1999) compared the MLUm and MLUw of Timmy's English data and showed that the two methods of calculation yielded essentially the same pattern of development.

9. There is also one example of what appears to be a headless free relative in Sophie's data:
   You already eat is what? (3;11;12) [What is it that you already ate?]

10. In the examples elicited by Mckee et al. (1998), the nouns *strawberries* in (62) and *bicycle* in (63) indicate the target head nouns of the relative clauses.

11. Peng (1998) investigated the development of *wh*-interrogatives in Timmy and found a stage where Cantonese-based in-situ structures were produced in English during a period when Cantonese dominance prevailed. Huang (1999) found that null objects in Timmy's English showed both quantitative and qualitative differences from the monolingual counterparts: the higher percentage of null objects and transfer-based null object structures were also found in the period of Cantonese dominance.

12. The MLUw differential for Sophie applies to age 1;06-3;00;09, as discussed in section 2.3. At the time of writing, transcripts of the recordings, and hence MLU values, are not yet available for the subsequent period 3;00-4;00 in which relative clauses appear. Our observations suggest, however, that the pattern of Cantonese dominance persists into this period and beyond.

13. We are grateful to Professor Rudolf de Rijk of Leiden University for drawing our attention to the possibility of relative clauses which lack strict grammatical relations and their potential significance for Cantonese grammar.

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