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Dual Input and Learnability: Null Objects in Cantonese-English Bilingual Children¹

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1. Background

The findings in this paper form part of a larger project investigating the bilingual acquisition of children simultaneously exposed to Cantonese and English from birth. The data are drawn from *The Hong Kong Bilingual Child Language Corpus*, a longitudinal corpus which is now available via the Child Language Data Exchange System (CHILDES) archive at <http://childes.psy.cmu.edu/>.² The corpus released to date contains five children's data with over 340 files of transcripts, half in English and half in Cantonese. Special features include sample transcripts linked to digital audio and video files in some cases so that these transcripts can not only be read but also heard, and the action viewed on screen.

The corpus of two subject's transcripts of longitudinal recordings from the age of 1;6 and 3;6 forms the primary empirical basis for the findings reported in this study. In addition, as parents of these two children, we have also kept our own diary of their progress. The creation of a longitudinal database, *The Hong Kong Bilingual Child Language Corpus*, allows us to systematically investigate the development of simultaneous bilingualism in early childhood. Yip and Matthews (2000) have demonstrated Cantonese influence on English in three main areas of grammar, including null objects as in (1):

(1) You get, I eat... [father takes chocolates off shelf] (2;02;03)

In this example (from diary data) the missing object refers to certain chocolates which are present in the speech context. We therefore argue that a null object is understood and in fact part of the sentence structure, following Chinese grammar.

This paper discusses the analysis of the structures involved in (1) and the learnability issues given rise by transfer here: why are null objects more frequent in bilingual than in monolingual development, and produced over a longer period? Input ambiguity in the sense of Müller (1998) suggests a mechanism to explain how such interaction takes place between separate systems in bilingual development.

A major objective of the project of which this is a part is to document the longitudinal development of Cantonese-English bilingualism in childhood in the first three years of life. Just as bringing a wider range of languages into consideration changes our view of what is possible in human languages, so it promises to change our view of what is possible in language development. Yip and Matthews (2000) and Matthews and Yip (2003) present a range of data which provide compelling evidence for a set of

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² At the time of writing, the Hong Kong Bilingual Child Language Corpus is the largest bilingual corpus deposited at CHILDES. The project website is at <http://www.cuhk.edu.hk/lin/home/bilingual.htm>

propositions about this case of bilingual development, including the following:

- While the bilingual child's two language systems are differentiated early (De Houwer 1990, Genesee et al. 1995, Meisel 2001 among others), there is considerable interaction between the two languages in contact in the child's mind (Döpke 2000). In particular, there is strong evidence for syntactic transfer and a high degree of interactivity between the two linguistic systems.
- There are principles determining the direction of transfer and mechanisms which account for how it takes place; these principles include language dominance and input ambiguity. This paper will take up the issue of input ambiguity and discuss the role it plays in a transfer phenomenon.

2. Null objects: transfer and learnability

We shall now focus on the development of null objects in the bilingual children's English and discuss the learnability problem raised by this phenomenon.³ The acquisition of the grammar of object omissibility can be seen as tied in with the bigger problem of acquisition of argument structure. To better appreciate the problem involved in learning the target properties in question, let's start with a characterization of the complexities regarding the question of object omissibility in the adult input.

2.1 Object omissibility in adult English

The traditional classification of verbs into transitive verbs and intransitive verbs largely masks the problem of object omissibility. The question of what verbs are obligatorily transitive in adult English is far from straightforward. Some verbs like *eat*, *read*, *teach* can be both transitive and intransitive and the constraints governing each argument structure are determined by a range of properties involving semantic and discourse factors. Some verbs like causative *kill* and *break* are in most cases transitive but still allow optional objects, as shown by Goldberg (2001). Such causative verbs are often assumed to require a subcategorized object, as illustrated in (2-3):

- (2) *The tiger killed.
- (3) The tiger killed the snake.

Yet these verbs in fact allow omitted patient arguments in certain circumstances. The following examples are taken from Goldberg (2001:506):

- (4) a. The chef-in-training chopped and diced all afternoon.
b. Tigers only kill at night.
c. The singer always aimed to dazzle/please/disappoint/impress/charm.
d. Pat gave and gave, but Chris just took and took.
e. These revolutionary new brooms sweep cleaner than ever (Aarts, 1995:85)
f. The sewing instructor always cut in straight lines.

The unexpressed patient arguments in (4a–f) are interpreted as indefinite, nonspecific entities that are largely predictable. In addition to nonspecificity and predictability, Goldberg (2001) argued that the actions designated by the verbs are aspectually iterative (4a, d) or generic (4b, c, e, f) and construed as atelic or temporally unbounded events. If the sentence refers to a specific rather than a generic event, then object omission is not allowed (Fillmore 1986):

- (5) What happened to that carrot?
I chopped *(it).

³ We are not directly concerned here with development of null *subjects* in the bilingual subjects, which raise a rather different set of questions. Huang (1999) found neither qualitative nor quantitative differences between the bilingual subject Timmy and his monolingual counterparts as far as null subjects are concerned, although it appears that the unlearning of null subjects may take a longer time for bilingual than for monolingual children.

- (6) What happened to that gazelle?
The tiger killed *(it).

2.2 Object omissibility in monolingual child English

The acquisition of object omissibility in monolingual English-speaking children has been studied by a number of researchers, notably Rispoli (1992) and Ingham (1993). Rispoli (1992) studied the verb *eat* in the longitudinal transcripts of 40 monolingual English-speaking children between 1;0-3;0 and found evidence for sensitivity to the relationship between object omission and discourse context at an average age of 2;03 and MLU of 2.4: the differential is 19% between the object omission rate in the discourse context which favors an overt object (26%) and that in the context which favors the intransitive (45%).⁴ Monolingual children also go through a stage where they inappropriately use the verb *eat* without an object as in (20):

- (7) (Parent has just opened a bag of popcorn)
Parent: Popcorn
Child: I eat (2;06)
Parent: You gonna save some for your dad? (Rispoli 1992:589-590)

In this example, the child's use of the verb *eat* without an object sounds odd. From the context, it is natural to assume that *popcorn* is part of the discourse topic which is subsequently referred to again in the parent's reply where *some* refers back to the previously mentioned *popcorn*. Rispoli found that children often omitted the object of the verb *eat* when the object has definite reference in the discourse context – exactly when it cannot be omitted in adult English.

The default reading is that the understood patient of the verb *eat* is something generic like “food” or “a meal” but not something specific as “sandwich”, or *peas* in (8).

- (8) A: Did you eat your peas?
B: *Yes I ate.

Fillmore (1986) points out that the omitted patient is interpreted as “obligatorily disjoint in reference with anything saliently present in the pragmatic context.” The intransitive form of *eat* is therefore strange here, since the conversation calls for the maintenance of a definite referent referring to *peas* or else the dialogue becomes incoherent. B's reply is infelicitous since A's question has not been answered: while *I ate* is interpretable as meaning that the speaker ate something, it cannot mean “Yes, I ate the peas.” As we shall show, it can in our subjects' English.

Haegeman (1987) suggests that the intransitive *eat*-type verbs including verbs like *read* and *teach* have a lexical representation as in (9):

- (9) eat β
[+generic]

To acquire target English, the child would have to develop a representation for intransitive *eat* as in (9), where β represents an implied patient argument (but is not syntactically present). The semantic feature +*generic* would need to be set to constrain the relevant interpretation. The associated discourse properties as discussed by Fillmore (1986) would also need to be acquired. Rispoli (1992) suggests that the focal status of the undergoer (patient) in the discourse context would be crucial to the acquisition of

⁴ The two year olds were still on their way to full adult competence – not only do they have to acquire the obligatoriness of the object in the case of transitive *eat*, they also have to learn when to use the intransitive *eat* when the thing eaten is taken to be generic or indefinite. In Rispoli's study, even the older children (3 year olds) produced few intransitive forms of *eat* in contexts where the implied undergoer is interpreted as indefinite, referring to anything edible.

the target properties: when the patient is focal as in (8), the conversation demands continued mention of this explicit patient.

A related set of problems is addressed by Ingham (1993), who discusses the optionality of objects in adult English and in Naomi, a monolingual English-speaking child. He points out that omission of a referential object is grammatical with certain verbs:

(10) They ran away but we followed (them).

(11) John aimed at the target and missed (it). (Ingham 1993:96)

The verbs Ingham identifies as allowing an optional object in the monolingual data include *kick*, *read*, *touch*, *bang*, *draw*, *push*, *see*, *wash* and *eat*. Unlike those generic cases discussed above, these cases involve missing objects which are specific in reference. Note also that the sentences involve coordinate structures, with *and* or *but*, forming a different category of omissible object contexts which we leave aside for this paper.

Ingham (1993:109) showed that Naomi's error rate in omitting obligatory objects was low in the period under study (1;08-1;11): 4.8% (12/251 tokens).⁵ Huang (1999) investigated the null objects in Adam's data in the Brown Corpus (Brown 1973) and found that between 2;05-2;09, the average null object rate over the period is 3.5%, as shown in Table 1.⁶ Among the verbs which Adam uses with null objects (Table 2), the frequency varies between 3% for *want* and 9% for *find*, *push* and *stir*.

Table 1 Frequency of Null Objects in Adam's English (based on Huang 1999:83)

File Name	Age	No. of null objects	No. of verb-complement structures	% of null objects
06	2;05;12	3	105	2.86%
08	2;06;17	4	134	2.99%
10	2;07;00	6	145	4.14%
12	2;08;00	4	124	3.23%
14	2;09;00	4	89	4.49%
		Total = 21	Total = 597	
		Average over the period =		3.5%

Table 2 Frequency of Null Objects in Adam's data (based on Huang 1999:83)
(only verbs which appear in 10 or more tokens in the corpus are shown)

Verb	No. of null objects	Total number of occurrence of each verb	% of null objects
bite	1	15	6.7%
find	1	11	9.1%
need	1	15	6.7%
push	2	21	9.5%
put	7	97	7.2%
stir	1	11	9.1%
want	2	52	3.8%

⁵ Unlike subjects, objects in Naomi's developing grammar do not seem to be optional or omissible. Ingham (1993:111) shows an asymmetry between Naomi's null subject rates vs. null object rates: 52% null subjects at 1;10 and 42% at 1;11, in stark contrast with the low null object rates (4.8%).

⁶ In monolingual English corpora, different percentages of null objects are found depending on the criteria used. An asymmetry has been widely noted between the prevalence of null subjects on the one hand and the relative rarity of null objects on the other in early child English (see Wang, Lillo-Martin, Best and Levitt, 1992, Hyams and Wexler 1993). According to Hyams and Wexler (1993: 426), the average null object rate for Adam (2;5 - 3;0) and Eve (1;6 - 2;1) from Brown's monolingual corpus was about 8%-9%. These figures include a number of optionally transitive verbs (such as *read*, *wash* and *eat*), and thus over-estimate the rate of null objects.

We now turn to the bilingual children's English data. Compared to the monolingual English-speaking children, the bilingual children's English shows strikingly more frequent occurrences of non-target null objects:

- (12) Daddy: Timmy, do you want the rest of this?
 Timmy: I don't want. (2;07;07)
- (13) Sophie: Don't break! [cautioning the adult not to break a toy cup] (3;06;06)

These examples show that a specific object is present in the speech context in (12), and implied in (13).

If children hypothesize object omissibility with a verb such as *eat* in contexts where an object is required, the learnability problem immediately arises. As we shall argue, the problem for bilingual children is more acute than for monolingual children when the dual input involves a language that allows null objects in a much more unrestricted manner.

2.3 Comparing null objects in monolingual and bilingual English

While null objects appear as a developmental feature in English monolingual corpora, qualitative and quantitative differences between the monolingual and bilingual cases can nevertheless be observed. We first discuss the quantitative differences and then the qualitative differences identified.

Quantitatively, the percentage of null objects in Timmy's first eight recording sessions (2;04-2;08) ranges from 9.1%-28.6%, a higher range than has been reported in any monolingual studies. In the subsequent period from 2;09-3;06, the rate drops but remains consistently above 5%. In the parallel development of Timmy's Cantonese in the same period (2;04-2;8), the rate of null objects ranges from 12.3%-35.3% and is consistently above 10% throughout the whole period, remaining between 22.9%-35.8% toward the end of the recording (3;04-3;06). These figures are comparable to those for monolingual children acquiring Cantonese (20-30% in Wong, 1998) and Mandarin (22.5 % in Wang et al., 1992). Comparing the null object rate in Timmy's two languages, it can be seen that the range is especially similar during the period from 2;04-2;08. Tables 3 and 4 show the five most frequent verbs that take a null object in Timmy and Sophie's corpora.

Table 3 Frequency of null objects in the Bilingual English Corpus
 (Timmy: 32 files from 2;04.14 – 3;06.25; Sophie: 11 files from 2;07.24 – 3;00.09)

Verb	No. of null objects		Total no. of occurrence of each verb		% of null objects	
	Timmy	Sophie	Timmy	Sophie	Timmy	Sophie
get	36	5	163	11	22%	45%
like	5	7	71	26	7%	27%
put	27	14	78	14	35%	100%
take	6	8	32	14	19%	57%
want	9	38	47	96	19%	40%

The most striking finding is that among the most frequent verbs that take an obligatory object, the verb *put* stands out as taking a null object 35% of the time in Timmy's data between 2;04.14 – 3;06.25 (MLUw between 2.4 and 4.2) and up to 100% of the time in Sophie's data between 2;07-3;00.09 (MLUw between 2.2-2.7) whereas other verbs including *get*, *like*, *take* and *want* vary in their frequency of taking a null object, ranging between 7%-57%. The special status of *put* is no doubt related to the fact that it takes a locative prepositional phrase as an obligatory complement, which is typically realized in the child data.⁷

⁷ In example (15) the locative *wh*-phrase *in the where* appears in the subcategorized locative position as in (16), rather than moving to sentence-initial position as in English. This illustrates *wh-in situ*, another syntactic property transferred from Cantonese, as documented for Timmy in Yip and Matthews (2000).

(14) INV: Where shall we stick it? (Timmy 2;05;05)

CHI: Put here.

(15) I put in the where? (Sophie 2;05;25)

This non-target-like structure whereby *put* is directly followed by a locative resembles the Cantonese structure:

(16) baai2 (hai2) li1dou6.

put at here

“Put [it] here.”

Such null object structures are commonly found in the children’s Cantonese, serving as the basis for transfer into English. An example is:

(17) baai2 dai1 sin1 (Sophie, 2;02;26, receiving cup of milk)

put down first

“put [it] down first”

A preliminary analysis of the frequency of null objects in Timmy and Sophie’s Cantonese data has been carried out as well. The results are given in Table 4 (based on J.Yip 2003).

Table 4. Frequency of null objects in the Bilingual Cantonese corpus

(Timmy: 22 files from 2;01.22 to 3;00.09; Sophie: 28 files from 2;00.07 to 3;00.09)

Verb	No. of null objects		Total no. of occurrence of each verb		% of null objects	
	Timmy	Sophie	Timmy	Sophie	Timmy	Sophie
<i>lo2</i> ‘get’	50	53	93	72	54%	74%
<i>zung1ji3</i> ‘like’	21	59	32	91	66%	65%
<i>baai2</i> ‘put’	39	20	43	21	91%	95%
<i>jiu3</i> ‘want’	62	97	90	136	69%	71%

The percentage of null objects in the bilingual subjects’ Cantonese corpus ranges from 54% to 95%, figures which are on the whole higher than the corresponding frequency of null objects in the same subjects’ English (see Table 4). This implies that the children are not merely treating English as Cantonese. Nevertheless they are producing null objects under the influence of their Cantonese grammar.

This quantitative picture is supported by qualitative evidence for transfer. There are, for example, cases where the verb is used in a Cantonese sense, like *have* in (18):

(18) INV: Where’s your school bag?

INV: Any books in it?

CHI: Still have. (Timmy 2;07;28)

Apart from the null subject and object in *still have*, the existential use of *have* suggests transfer from the Cantonese verb *jau5* as in the adult Cantonese sentence (19):⁸

(19) Zung6 jau5.

Still have

“There are still some (there).”

There is also diary data in which an English utterance with null object follows a synonymous Cantonese one as in (20), and the occurrence of null objects in code-switched utterances such as (21):

(20) [seeing father replacing batteries]

Jiu3 maai5 aa3. Have to buy. Have to buy battery at Mannings. (Timmy 2;10;22)

need buy PRT

“We have to buy some.”

(21) Ngo5 jiu3 close... I cannot close. [trying to close door] (Timmy 2;02.22)

I want close

“I want to close it.”

These cases support the assumption that the Cantonese and English structures are parallel for the child.

A further qualitative argument involves the mechanism which licenses null objects in Cantonese, and which is hypothesized to be transferred to English in the bilingual subjects. The analysis we assume involves a relationship between topicalization of objects and the occurrence of null objects. In cases like (22) we can see how a topicalized object paves the way for a null object:

(22) Schoolbag put here, put at the door. (Timmy 2;07;12)

Here the object of the first *put*, namely *schoolbag*, has been made the sentence topic, while the missing object of the second occurrence of *put* refers back to the same topic. This is the essence of the analysis of null objects developed by Huang (1984) and widely assumed in acquisition studies (Yip 1995:81, Yuan 1997:473). Thus the Cantonese counterpart of (22) would be analyzed as in (23), where [x_i] indicates a null object bound by (and referring back to) the sentence topic:

(23) [_{TOPIC} syu1-baau1]_i [_∅] baai2 [x_i] hai2 ni1dou6, baai2 [x_i] hai2 mun4hau2 dou6

book-bag put at here put at doorway there

“(Let’s) put the school bag here, put it by the door.”

The same analysis can be extended to cases where the topicalization is implicit rather than overt:

(24) You bought this for me. Last time you bought. I know you bought. (Timmy 2;07;11)

Here the object *this* is introduced as the object of *bought*, then becomes the (null) topic of the following discourse, thereby licensing the null objects in the following two clauses:

(25) You bought [x_i]_i for me. [_{TOPIC}]_i last time you bought [x_i]. [_{TOPIC}]_i I know you bought [x_i].

In examples like (22) and (24), then, the child’s use of null objects can be captured by the analysis proposed for Chinese as shown in (23) and (25), further supporting the argument for transfer of

⁸ The existential use of *have* is frequent in Timmy’s English. In the following example of a code-switched utterance, a Cantonese existential sentence using *jau5* is juxtaposed with an English one:

CHI: Jau5 tong1 jam2 aa3. Have soup. (Timmy 2;05;08)

have soup drink PRT

“There’s soup to drink.”

syntactic structure.

We have now shown *what* is transferred, in terms of syntactic structure and representation. We turn next to *why* transfer occurs in this particular area of grammar.

2.3 *The role of input ambiguity in transfer*

Recent studies in bilingual development have established that transfer from A to language B is facilitated by ambiguity in the input in language B (Müller 1998, Müller and Hulk 2001). Müller (1998:153) hypothesizes that transfer may occur when “two different grammatical hypotheses are compatible with the same surface string.” A language becomes a prime target of transfer when input ambiguity arises in a certain area of its grammar. That is, the input offers ambiguous evidence with respect to the target grammar of B. The possibility for transfer arises when a surface string in the input is compatible with the grammar of A as well as that of B. By hypothesizing that the relevant rules and representations provided by the grammar of A applies to both languages, the child can handle the ambiguous data, but will also produce non-target forms in B based on grammar A.⁹

In our case, the English input includes optionally transitive verbs such as *eat* appearing without an object, as in (26):

(26) Let’s eat.

Such sentences in the input are compatible with at least two analyses:

(a) the target analysis applicable to adult English, in which the missing object is not syntactically present, but interpreted semantically as generic:

(27) eat β
[+generic]

(b) the analysis based on Chinese grammar (see examples 22-25), in which the missing object is syntactically present, coreferential with a null topic and therefore interpreted as specific:

(28) [TOPIC]_i eat x_i
[+specific]

We have ample evidence that our subjects are applying the Chinese-based analysis (b). For example, in (29) below the ‘ambiguous’ verb *eat* is accompanied by the unambiguous verb *get*, to which the English analysis (a) would not be applicable. Moreover, the context supplies a specific topic to which the missing objects refer:

(29) You get, I eat [father takes chocolates off shelf] (Timmy 2;02;03)

The analysis based on Chinese is thus as in (30) below:

(30) [TOPIC (chocolates)]_i You get [x_i], I eat [x_i]

This is a case of the topic chain construction (Shi 1989, 2000) in which a single topic licenses multiple null arguments coreferential with it. In the following cases from Sophie, the null topic (a bottle of pills in (31), a poisoned apple in (32)) is explicitly named in the preceding and/or following discourse:

(31) This one vitamin. I want to eat. (Sophie 2;05;24)

⁹ This account assumes that the relevant aspect of grammar A has already been fully acquired, which in practice may depend on the child’s pattern of language dominance; there is thus scope for interaction between these two factors favoring transfer.

- (32) INV: We don't want to eat apple, right?
 INV: Right?
 CHI: me want to eat.
 INV: What do you want to eat?
 CHI: apple. (Sophie 3;00;02)

In the dual input that the bilingual child is exposed to, input ambiguity with respect to object omissibility only arises in English, where verbs like *eat* sometimes appear as transitive and sometimes as intransitive; whereas in the Cantonese input there is across the board optionality, whereby all transitive verbs can appear with or without an object, as long as it is licensed by a topic (which may be overt or null). If the bilingual child assumes that English transitive verbs behave like Cantonese ones and posits a Cantonese-based representation for the objectless sentences as in (29), a learnability problem naturally arises: what evidence would lead the child to reject this misguided analysis?

2.4 Resolution of non-target structures

The input ambiguity account explains why transfer occurs in this grammatical domain. It also suggests why the Cantonese-based analysis is difficult to unlearn: every time the child hears the intransitive *eat*, she may assume a null topic analysis. What evidence could lead the child to reject the analysis? In principle, a context in which no plausible discourse topic is present would cause the child's analysis to "crash", that is, to fail to assign appropriate reference to the null object. Without a null topic provided by the discourse context, the null object will not be licensed and the sentence will not be fully interpretable. Consider a hypothetical scenario:¹⁰

- (33) Child: [I'm] hungry!
 Father: Okay, let's eat.

If there is no food around, the father's use of *eat* without an object will be incompatible with the null topic analysis assumed by the child. It remains an empirical question whether such experiences are in fact sufficient to prompt reorganization of the grammar.

Clearly, recovering from the Chinese-based analysis is not straightforward. Whereas other transfer-based structures such as *wh*-in-situ interrogatives and prenominal relatives gradually resolve themselves between ages 3–4 (Yip and Matthews 2000:207), null objects remain recalcitrant, persisting for a protracted period of time. The null objects are still observed in our subjects at age six. The difficulty of unlearning them can be attributed to the challenge posed by the interplay of the ambiguity in the dual input in their environment and the continued dominance of Cantonese over English.

The logical problem here is recognized in accounts which assume conservative learning in monolingual children. To ensure the learnability of object omission, Roeper (1981:140) hypothesized the following principle:

- (34) All subcategorizations are obligatory until positive evidence shows that they are optional.

Although monolingual English-speaking children do not seem to be quite as conservative as envisaged by the strong form of Roeper's hypothesis, their object omission rate is far lower than for the bilingual children (compare tables 1 - 4 above). Monolingual children tend to avoid dropping objects of verbs which are used only transitively by their caregivers (Roeper 1981, Ingham 1993). To the extent that the null objects in monolingual English children as a class are not grammatically omissible, their occurrence could be attributed to performance limitations (Hyams 1986), thus preserving the null hypothesis that objects are obligatory. In contrast, the null objects in the bilingual data are much more

¹⁰ Rispoli (1992: 584) gives a similar example, glossing *eat* as "satisfy hunger".

frequent and produced over a protracted period of time relative to the monolingual data. It is clear that the bilingual children go beyond the attested English input and posit optional objects in cases where the adult grammar does not sanction them.

3. Conclusions

In this study we have looked at the occurrence of null objects in the bilingual children's English and the learnability issues given rise by transfer from their Cantonese. We have shown that null objects are produced more frequently and over a longer period than in the monolingual counterparts. Both quantitative and qualitative evidence points to transfer of the null topic mechanism which licenses null objects in Cantonese. We have suggested that transfer in this domain is facilitated by the ambiguity of the English input which lends itself to a Chinese-style analysis.

The bilingual subjects' English clearly differs from monolinguals in that null objects are licensed in their grammar, due to cross-linguistic influence from Cantonese. Unlike other non-target structures such as *wh*-in-situ interrogatives, the use of null objects take a long time to unlearn as the diary record suggests that they persisted well into age six, though with decreasing frequency. Another reason that makes unlearning difficult is the ambiguity that English verbs pose - which ones are obligatorily transitive and which ones are not. In the case of adult Chinese learners of English, it has also been noted that null objects are more difficult to detect and unlearn than null subjects (cf. Yip 1995, Yuan 1997). However, young bilingual children stand a better chance of acquiring the target properties than adult second language learners whose grammars may remain fossilized with the recalcitrant null objects. Exactly when, how, and to what extent the bilingual subjects overcome this challenge remains a question for further investigation.

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