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## **Abstract**

Object omission is a defining property of the Chinese language while it is not the case in English and Spanish. In this study, I consider children's early object omissions in English in a comparative study with Chinese-English bilinguals, Spanish-English bilinguals and English monolinguals. The goal is to evaluate the extent to which the null object mechanism in Chinese influences Chinese-English bilinguals' English development. I compare the ungrammatical null object production from the three groups of participants from both quantitative and qualitative perspectives. The results show that Chinese-English bilinguals' performance in terms of object realization in English is significantly different from that of Spanish-English bilinguals and English monolinguals. This finding supports the conclusion that, although the null object mechanism is a property of developing grammars, in the case of Chinese-English bilinguals' English development it results in negative transfer.

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## 1 Introduction

Pinker (1994) puts forward the concept of “language instinct” by arguing that language is not a human invention and that humans are born with an innate capacity for language. As the topic which I am going to discuss in this paper is bilingual development, I would like to refer to this capacity as “bilingual instinct”, which can be defined as the language instinct that is fully demonstrated in children’s spontaneous acquisition of two languages. Genesee, Nicoladis and Paradis (1995) state that since it is reasonable to conjecture that bilingual children’s frequency of exposure to each language is smaller than that of monolinguals acquiring each language, if bilingual children show the same rate of syntactic development as monolinguals, this could argue for a process of development through selection or triggering instead of learning (9). This is to say, the language instinct functions in the same way in the language acquisition process of both monolinguals and bilinguals.

There also exists a general consensus on the Language Differentiation Hypothesis on bilingualism, which indicates that bilingual children establish two separate language systems at the very initial stage of language acquisition (Genesee 1989, Meisel 1989, De Houwer 1990, Genesee, Nicoladis and Paradis 1995, among others). However, regardless of this consensus, how the interaction takes place between the two languages within the Differentiation Hypothesis remains doubtful: whether one language may influence the development of the other (Interdependent Development Hypothesis) (Cummins 1979, 1991, Bernhardt and Kamil 1995, Van Gelderen et al. 2004, among others) or whether the development of each language is comparable to the development of monolinguals (Autonomous Development Hypothesis) (Paradis and Genesee 1996, 1997, Meisel 2001, among others). The present study provides new evidence for the postulation that the development of the two languages is interdependent—the

development of the bilingual system occurs in such a way that the two languages influence each other.

Within the context of the Interdependent Hypothesis, the present study focuses on how bilingual children acquire and produce objects, in particular, those null objects which are ungrammatical based on the discourse context restrictions that apply in the adult grammar.

In this paper, I consider children's early object omission in a comparative study on the English production of six children—two are Cantonese-English bilingual, two are Spanish-English bilingual and two are English monolingual. The goal is to provide new evidence for the claim that the two languages in bilinguals may influence each other in a certain way and that high rate of object omissions in Chinese-English bilingual children may result from the different object realization mechanism of the Chinese and the English languages. The results of the data analysis demonstrate that not all bilinguals produce more null objects which are illicit based on discourse contexts than monolinguals—the type of languages spoken by bilingual children is highly relevant to the issue. On the one hand, bilinguals and monolinguals do not show any significant difference in their performance in object realization providing that the two first languages (2L1s) of the bilinguals are both [- null object] languages (e.g. Spanish and English). On the other hand, in the case that one of the L1s spoken by the bilingual children is [+ null object] and the other is [- null object] (e.g. Chinese and English), the frequency of ungrammatical object omissions in the bilinguals' output of the [- null object] language is significantly higher than that in the output of monolinguals and other bilinguals whose 2L1s belong to the [- null object] category.

The present paper is organized as follows. Section 2 reviews the previous literature on the acquisition of null objects in child language. Section 3 addresses three main theoretical issues

that frame the present study, namely, the description of null objects in the three languages under investigation, i.e. Chinese, English and Spanish, verbal transitivity in English and language transfer. Section 4 presents the objectives and hypotheses of this paper. Section 5 shows how the present study has been carried out and the procedures of data selection and data classification. Section 6 gives the results of the data analysis of this study from both quantitative and qualitative perspectives. Finally, section 7 presents the conclusions.

## **2 Previous Studies on Null Objects in Child Language**

So far a few articles concerning object realization in child English have been published, which offer us some important insights and suggestions to deal with the issue under analysis in the present study. The studies referred to below show empirical work based on both monolingual (Valian 1991, Rispoli 1992, Ingham 1993/1994, Pérez-Leroux et al. 2008) and bilingual (Yip and Matthews 2005) children's data.

Valian (1991) explains children's omission of verb-arguments from the perspective of performance limitation. She assumes that from the early stages of language development children operate with an abstract knowledge of grammar but are constrained in their language production by performance limitations. In this sense, they are expected to avoid producing utterances which they "know" to be ungrammatical, although they might not be able to produce structures which they "know" are grammatical; there is, therefore, a difference between "knowing" (i.e. the competence of) and "being able to produce" (i.e. the performance of) a structure. She further explains this assumption by predicting that young children will produce a greater proportion of intransitive verb utterances than children who are more advanced in their language development because intransitive verbs do not require a direct object argument and

thus demand less processing power than transitive utterances. And then the use of transitive verbs will increase over time as processing restrictions decrease. Her second prediction is that children are assumed to “know” that direct objects are obligatory with transitive verbs and therefore they are expected to produce a high proportion of direct object arguments with verbs that belong to this category. Taking these two predictions as a point of departure, her study demonstrates that children are also able to identify verbs that appear to be optionally transitive from their use in the input. Since producing an utterance with a null object requires less processing capacity than producing an overt object, children are initially expected to produce a lower proportion of direct object arguments with verbs that may occur with or without an object than with pure transitive verbs. Valian claims that children’s production of optional direct objects will also increase over time.

Rispoli (1992) points out that English contains several classes of transitive verbs which can optionally appear without an undergoer (i.e. a direct object). Older children are expected to be able to learn these verbs through syntactic bootstrapping, which refers to the fact that, when presented with a sentence that includes an unfamiliar verb, children take into account extralinguistic context clues to help them in determining what the definition of that verb is. However, during the early stages of language acquisition, children may not be able to be informed of the semantic representation of these verbs from information sources based on surface structure. The author conducts a longitudinal study on the acquisition of a single English verb, i.e. *eat*, which is observed to be the first member of the verb class that can appear to be both transitive and intransitive to be acquired, in a group of 40 monolingual English-speaking children whose spontaneous production has been recorded at monthly intervals from one to three years of age. He codes all occurrences of the verb for presence or absence of an overt undergoer.

Children's response utterances are also coded for the discourse context, that is, whether a potential undergoer is already available in the discourse itself, or whether the verb is open to undergoer omission, which offers us a very clear and detailed view on object realization and object omission in the children's language production. The results indicate that once the cumulative verb lexicon size has reached a certain threshold level (75 types) at the age around 2;3 and MLU<sup>1</sup> of 2.4 approximately, children start to establish a sensitivity to the relationship between object omission and discourse context.

Ingham (1993/1994) discusses the relation between the argument frames used in the adult input and those used by the child participants. He carries out two studies—one is an observational case study of the target child Naomi, a monolingual English speaker, from 1;8 to 1;11 and the other is an experimental study with thirty-six 4-year-olds. Study 1 compares Naomi's use of verbs to that of her mother's. In Study 2, the participants see actions carried out with unfamiliar implements and are instructed to produce a verb form associated with each action. The investigator points out that the omission of a referential object is grammatical with some verbs, as the examples in (1) and (2) show:

(1) They ran away but we followed Ø (them).

(2) John aimed at the target and missed Ø (it).

(Ingham 1993/1994: 96)

A clear relationship is discovered between direct object realization with transitive verbs in the input received by the participants and their own direct object realization with transitive verbs. Ingham claims that the frequency of omission of a referential object is strongly associated with the input evidence: children are significantly less likely to omit a direct object when input

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<sup>1</sup> The MLU (Mean Length of Utterance) is a measure of linguistic productivity in children. It is derived from two totals: the total number of utterances and the total number of either morphemes (standard MLU) or words (MLUw) for each speaker and in each file/transcript. The MLU value is often used to assess a child's language abilities.

provides no evidence of direct object omissibility; however, when input evidence of omissibility is provided, the frequency of object omission is significantly higher. He further proposes that children strongly follow the evidence available from their linguistic environment as to whether an intransitive argument structure is possible.

Pérez-Leroux et al. (2008) conduct two experimental studies on early object omissions of monolingual French-speaking children and their monolingual English-speaking counterparts. The authors point out that object realization or object omission contains both a syntactic component and a lexical component (see section 3.2 below for a more detailed account of this aspect). The studies also reveal that developmental rates are related to the complexity of the input: differences in the rate of object omissions depend directly on the extent and variety of null object constructions available in the target grammar. The authors claim that all children go through a stage of object pronoun optionality, and that this stage does not reflect difficulty in computation, but rather the free availability of referential null cognate objects, which refer to empty Ns whose semantic features are derived from those of the verb. The function of null cognate objects is similar to overt cognate objects, which add no semantic information beyond that contained in the verb itself if unmodified. In Pérez-Leroux et al.'s study, the authors explain French-speaking children's longer retention of the referential reading of the null cognate object as the result of exposure to a wider variety of null object contexts. They conclude from the two studies that lexical learning in the verbal domain is driven by syntax.

Yip and Matthews (2005) conduct a longitudinal study of Cantonese-English bilingual children in the first three years of their life and discuss the issue of object omission by comparing the language output of Cantonese-English bilingual children with that of English monolingual children. They intend to find out the reason why null objects are more frequent in bilingual than

in monolingual development as well as their being produced over a longer period. The authors mention that object omissibility can also be found in adult English and the traditional classification of verb into transitive verbs and intransitive verbs largely masks the problem since some verbs can be both transitive and intransitive depending on different circumstances. What is more, the two authors point out that monolingual English-speaking children also produce illicit null objects during their language development. However, when comparing the illegitimate null objects produced by the English monolinguals and those produced by the Cantonese-English bilinguals, both quantitative and qualitative distinctions can be found, which serves as evidence for transfer of the null object mechanism from Cantonese into English.

The review of the different studies stated above, both in the case of work based on monolingual and on bilingual data analysis, points to two main ideas: the specific grammatical nature of null objects as represented in the input that children are exposed to (since the different languages behave in different ways in this respect and even within the same language no clear-cut pattern appears) and the developmental trait that characterizes the production of illicit null objects (as children acquire their L1 grammars, the production of this type of structure decreases). Both issues are important for the present study and thus the following section focuses on the theoretical description of null objects. In the case of the developmental trait, section 5 will take a longitudinal approach to the analysis of the data.

### **3 Theoretical Background**

This section serves as the theoretical frame for the present study and thus presents three main ideas which will lead to the formulation of the research questions and hypotheses that are at the basis of the present paper: a comparative grammar study of null objects in the three

languages under consideration; a detailed account of English null objects as the language under analysis; a description of the notion of transfer since not only English monolingual but also English bilingual data will be considered.

### ***3.1 Null Objects in Chinese, English and Spanish***

Languages can be classified into two groups based on whether they allow objects of transitive verbs to be phonetically null: [+ null object] languages and [- null object] languages. According to Fujino and Sano (2002), Chinese and Japanese belong to the former group while English, Spanish, French and Italian belong to the latter.

In terms of object realization, Chinese, English and Spanish are thus differently specified. When a complex discourse unit contains a sequence of identical objects, the first one must be expressed overtly; the succeeding object NPs may be repeated in the form of pronouns for purposes of clarity, emphasis, or contrast; otherwise they can be syntactically deleted. This type of omission is very common in both oral and written Chinese, whereas in English and Spanish it is ungrammatical (or more limited, see section 3.2 below).

English is considered as a [- null object] language and an object with definite reference is expected to be overtly expressed (either in the form of NP or pronoun), although object omissibility can be found legitimate under some circumstances, often in contexts such as recipes and instructions as shown in the examples (3) and (4) respectively:

(3) Mix  $\emptyset$  well and cook  $\emptyset$  for 2-3 minutes.

(4) A: We have to get this car ready for the show.

B: Okay, you wash  $\emptyset$  and I'll wax  $\emptyset$ .

Standard Spanish is a [- null object] language as well, in the sense that an object with definite reference must be overtly expressed either as a lexical NP or a clitic (Fujino and Sano 2002: 70). However, as in the case of English, object omissibility is also possible in Spanish under the condition where generic referents are non-specific as shown in examples (5) and (6):

(5) A: ¿Quieres zumo?

B: No gracias. Ya Ø tomé

(6) Hoy comemos Ø a las 3.

The normative difference regarding object realization among Chinese, English and Spanish is illustrated in (7) for Chinese and in (8) and (9) for English and Spanish respectively:

(7) A: 学生读书了吗? (Have Ø (the) students read Ø (the) book?)

B: 读了。 (Ø (They) have read Ø (it).)

(8) A: Have the students read the book?

B: Yes, they have. /Yes, they have read it. / \* Yes, they have read Ø.

(9) A: ¿Han leído el libro los estudiantes?

B: Sí lo han leído. / Sí han leído el libro. / \* Sí Ø han leído.

As we see in the dialogue in (7), Chinese direct object “the book” is dropped in the second sentence, while this would result in ungrammaticality in both English and Spanish in (8) and (9) where an overt object is required.

However, when comparing the English examples above (3-4 and 8), an interesting contrast emerges. Since English is the language under analysis in this study, the following section offers a more detailed view of the use of objects in English.

### 3.2 Verbal Transitivity in English

Verbs are traditionally classified into transitive verbs and intransitive verbs. However, empirical evidence has shown that transitive verbs can optionally appear without an overt object, as the examples in (3) and (4) above suggest.

Pérez-Leroux et al. (2006) have proposed two plausible conceptual approaches to optional transitivity: a lexical approach and a syntactic approach. They take the verb *eat* which is transitive but can appear without a direct object as the investigated target verb.

Under the lexical approach, *eat* can be described through two lexical entries:

(10a) *Eat*<sub>1</sub> unergative, “eat a meal”, incorporates an object component.

(10b) *Eat*<sub>2</sub> transitive, “ingest food in some manner”, incorporates a manner component that forces the presence of an object.

(Pérez-Leroux et al. 2006: 2)

An overt object used with the transitive *eat* is supposed to be syntactically present (as described in 10b). However, the view that the absence of an object with unergative *eat* indicates that no object is represented in the syntax (as in 10a) is problematic. First of all, as Fodor and Fodor (1980) point out, some verbs are associated with a meaning postulate: the unergative *eat* is still assumed to have an agent argument from the semantic perspective, because the act of eating by necessity involves something that is being eaten, but this argument has been left implicit. This proposal is supported by the fact that we do not interpret sentence (11) as expressing that Jack has been engaged in the physical activity of eating (as in 10b), but rather that we interpret the sentence as it is demonstrated in (11a), that is, as *eat*<sub>1</sub> in (10a):

(11) Jack has eaten Ø.

(11a) Jack has eaten a meal.

It can be considered that the object is incorporated to the lexical entry of the verb, which leads to the paradoxical view that its unergative interpretation involves an object. One is forced to posit a lexical rule so that the entry in (10b) can be turned into (10a) (P érez-Leroux et al. 2006: 2).

However, the purely lexical approach does not suffice for a clear answer for the issue. The description of the verb *eat* in (10) offers two options: there is an object or there is no object. The answer seems to be dubious since empirical evidence indicates that a projected null object is sometimes licensed as it is demonstrated in (12) below:

(12) Which document did the spy memorize before eating  $\emptyset$ ?

(P érez-Leroux et al. 2006: 3)

Ambiguity in meaning arises in sentence (12): a. the spy had some food after memorizing the document; b. the spy ate the document after memorizing it. The latter interpretation requires the existence of a gap that relies heavily on an available empty object for the verb *eat*. Under the lexical approach, then, apart from the two entries mentioned in (10), the third possibility for *eat* needs to be provided:

(13) *Eat*<sub>3</sub>, transitive with null object, “ingest specified food”.

(P érez-Leroux et al. 2006: 3)

Nevertheless, this third option is not idiosyncratic and most likely not lexical in nature, but rather a pervasive possibility that is available crosslinguistically.

What is more, verbal transitivity, as a lexical construct, is not an absolute categorical phenomenon: transitive verbs can appear intransitively as it is demonstrated below:

(14) The chef-in-training *chopped*  $\emptyset$  and *diced*  $\emptyset$  all afternoon.

(15) Pat *gave*  $\emptyset$  and *gave*  $\emptyset$ , but Chris just *took*  $\emptyset$  and *took*  $\emptyset$ .

(Yip and Matthews 2005: 2422)

Conversely, some intransitive verbs allow an overt object under certain circumstances. Unergative verbs commonly allow a modified cognate object, regular NP, or measure phrase to appear as their complement (Massam 1990) as the examples in (16)-(18) show:

(16) Jack sleeps a restless sleep.

(17) Jack sleeps the whole night.

(18) Jack ran a mile.

The verb *eat* can also be analyzed from a syntactic approach, which provides a single entry for the verb in question and derives the three uses of the discussed verb (as in 10a, 10b and 13 above). Under this approach, transitivity is viewed as a grammatical property instead of as a lexical property. If it is first assumed that V roots must merge with an XP complement, the basic transitive structure would be as shown in examples (19a)-(19c):

(19a) [<sub>VP</sub> V XP]

(19b) [<sub>VP</sub> V NP]

(19c) [<sub>VP</sub> V null N]

When unergative verbs and transitive verbs take no overt object, a null N is merged to V rather than to an NP. According to Hale and Keyser (2002), it can be assumed that the null N merged at V root enters into a semantic hyponymy relation with the V root. This means that the semantic indication of the null N is included in that of the V root.

As a null N, this object is non-referential but its class denotation allows it to make inference based on pragmatic situations, which eliminates the need for multiple lexical entries for transitive verbs used intransitively. The N can be considered as a null cognate object (Dobrovie-

Sorin 1998). Since this is the basic option available to all verbs, as represented in (19a), it can be taken to be the minimal instantiation of transitivity.

The verbal transitivity issue has also been addressed by Groefsema (1995) within the Relevance Theory framework. She argues that when the communicator chooses an utterance from a range of possible utterances, he/she chooses the optimally relevant one, which will be the one that gives the addressee adequate contextual effects for as little processing effort as possible. When an argument can be interpreted on the basis of a selection restriction, or on the basis of assumptions made immediately accessible by the rest of the utterance, it can be left implicit because that will save the addressee from going through the process of recovering its phonological form; when the interpretation is not constrained in either of these two ways, the communicator will have to linguistically realize the argument in such a way that it will enable the addressee to recover the intended interpretation (156).

Based on what has been said above, it can be noted that verbal transitivity in English is by no means a straightforward issue. As a consequence, in order to achieve the target output, children would have to consider a series of linguistic analyses that will involve lexical, syntactic and contextual dimensions (Pérez-Leroux et al. 2006, Groefsema 1995).

### ***3.3 Input Ambiguity and Language Transfer***

Previous studies suggest that ambiguity in the input triggers illicit structure in terms of object realization even though no language transfer is involved (Pérez-Leroux et al. 2006, Ingham 1993/1994, among others). Ingham's (1993/1994) analysis of the spontaneous speech of Naomi, a monolingual English-speaking child, has found that input ambiguity plays an important role with regard to object realization in child English. In his study, most of the direct objects

omitted by the participant are target-like omissions. Also the target child follows the input conservatively: the rate of direct object omission after the verbs that only appear as transitive in the input is significantly lower than that of those verbs that appear as optionally transitive.

Apart from the studies mentioned in the previous paragraph which deal with input ambiguity with monolingual data, there are as well studies that deal with the issue under consideration with bilingual data. Recent studies in bilingual development have proposed that transfer from language A to language B is likely to happen in those domains of the grammar where the language learner is confronted with ambiguity in the language input (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 A as well as that of B. By hypothesizing that the relevant rules and representations provided by the grammar A apply to both languages, the child can handle the ambiguous data, but will also produce non-target forms in language B based on grammar A. The bilingual child may use parts of the analysis of one language as a relief strategy in order to cope with ambiguous properties of the other. Ambiguity of input is crucial and can be evaluated through a comparison with monolingual language acquisition: if monolingual children have problems with the language material in question, it may be suggested that the input contains evidence for more than only one grammatical analysis (lexical, syntactic, semantic, etc.).

If language A allows two options (overt and null objects), and language B allows only one option (overt objects) but contains structures that do not fit with the core grammar rule (null objects), it could lead to two possible situations which would be able to be observed in the data:

- 1) Language B is not straightforward since a child could misinterpret that both options (null and overt) are correct; and so a monolingual child could produce illicit null objects. However, this cannot be attributed to language transfer because we are dealing with monolingual children.
- 2) In the same scenario but in the case of bilingual children, the production of illicit null objects in language B could be increased if the other L1 of the bilinguals (language A) allows for both options (null and overt objects).

Therefore, a quantitative difference (other than a qualitative difference) between monolingual and bilingual language acquisition could be interpreted as evidence in favor of crosslinguistic influence in bilingual language development.

#### **4 Research Objectives and Hypotheses**

Taking into account the previous theoretical and comparative account of object realization in the languages under consideration as well as previous empirical works on the analysis of the issue, the present study aims at offering a characterization of objects in the spontaneous production of Chinese-English and Spanish-English bilinguals and English monolinguals. In particular, it aims at providing new evidence in favor of three main issues concerning bilingual acquisition: the Interdependent Development Hypothesis (Cummins 1979, 1991, Bernhardt and Kamil 1995, Van Gelderen et al. 2004, among others), the issue of language transfer between the two languages of the bilinguals (Müller 1998, among others), and the

comparison between monolingual and bilingual acquisition (Yip and Matthews 2005, among others).

More specifically, the hypotheses that will be tested against the different sets of bilingual and monolingual spontaneous linguistic data are as follows:

- 1) Bilingual English output produced by Chinese-English bilinguals would be different from monolingual English output in terms of object realization.
- 2) Bilingual English output produced by Spanish-English bilinguals would be similar to monolingual English with regard to the issue under consideration.
- 3) The different performance between the Chinese-English bilinguals and the other two groups might result from language transfer from Chinese into English.

Another objective of this study is to investigate if bilingual children produce more ungrammatical object-drop sentences in their English output than monolingual children in a general term and, if so, if it is due to the object-drop mechanism in a specific type of language that makes bilingual children perform less adult-like than their monolingual counterparts. So what is at stake here is the nature of the other L1 of the bilinguals and the role that this other L1 plays in the acquisition of objects in English. More specifically, if positive transfer (from Spanish into English, since both languages pattern in the same way with regards to object realization) or negative transfer (from Chinese into English because of the different mechanism of the two languages in terms of object realization) occurs, this difference would be observed in bilingual English from the Chinese-English participants in the present study presenting more instances of illicit object-drop sentences than Spanish-English bilinguals and English monolinguals.

Regarding the issue of verbal transitivity in the English language, another set of hypotheses can also be proposed:

- 4) Optionally transitive verbs would be more difficult to acquire since they do not always show the same pattern and are then less transparent than purely transitive verbs (i.e. verbs always appearing with an overt object).
- 5) This difference in terms of verb type would be seen across all groups of participants (bilinguals and monolinguals alike). However, a quantitative difference would appear between the Chinese-English group and the other two groups (Spanish-English and monolingual English).

So it is expected that the different target children commit more errors in terms of object realization depending on verb type, although this could also correlate with language type.

## 5 Method

### 5.1 Participants

The data presented in this study are taken from CHILDES (MacWhinney 2000). The informants are Timmy and Llywelyn, two Cantonese-English bilinguals<sup>2</sup> in Hong Kong (Yip-Matthews corpus), Leo and Simon, two Spanish-English bilinguals in Salamanca (FerFuLice corpus) and Naomi (Sachs corpus) and Lara (Lara corpus), two English monolinguals, one in England and the other in the United States.

Timmy and Llywelyn were both born in Hong Kong. Their respective fathers are native speakers of British English and their respective mothers, native speakers of Cantonese. The children's exposure to Cantonese and English began from birth. The parents of both target

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<sup>2</sup> Mandarin and Cantonese are two different varieties of the Chinese language. However, in terms of object realization, both of them belong to the [+ null object] language group and their grammar is the same when it comes to the issue under discussion in the present study.

children followed the one parent-one language principle when addressing their child. Both families employed Filipino domestic helpers who spoke fluent English during the investigation period. In Timmy's case, apart from the regular English input from his father and the domestic helper, the child's additional contact with English was provided by occasional visits by English-speaking relatives. Moreover, several family trips to English-speaking countries took place during the recording period. In Llywelyn's case, due to professional reasons, his father was on frequent conference trips and was occasionally absent from home during the child's early years. In a general term, the quantity of Cantonese input is higher than that of English input in the two target children's language ecology due to the fact that Cantonese is the language spoken in the community.

Leo and Simon are identical twins born into a middle-class family in Spain. Their father is a native speaker of Peninsular Spanish and his mother, a native speaker of American English. The parents also followed the one parent-one language principle when addressing the children. The parents generally communicated in Spanish with each other except on summers when they travelled to the United States for approximately two months or when a monolingual English speaker was present. The mother was the primary caretaker during the first year since the target children were born. The father was present all day on weekends and less on workdays. At the age of 1;10, the twins started to go to day care for 3 hours per day on weekdays where the language used by the staff and by other children was Spanish. Apart from the mother, additional contact with English was provided by occasional visits by the maternal grandparents and during the two-month visits to the United States each summer.

Naomi was born and raised in a monolingual English family in the United States. Her mother is a university professor and also the investigator of the corpus. Lara was the first-born

monolingual English-speaking child of two white university graduates and was born and brought up in Nottinghamshire, England.

### ***5.2 Data Collection and Data Selection***

Timmy's recording continued on a weekly basis from 1;5;20 to 3;6;25; audio recording of Llywelyn was conducted on a bi-weekly basis from 2;0;12 to 3;4;14; Leo's and Simon's recordings were made irregularly at interval of less than 2 weeks, covering the age range of 1;1 to 6;11; Naomi was recorded irregularly at interval of less than one week, covering the time from age 1;1 to 5;1; Lara was recorded once or twice a week between the ages of 1;9;31 and 3;3;25. All of the recordings involved natural interaction between the child, the investigators and the family members and were made in naturalistic settings, usually at home, and thus recorded spontaneous data. The children were mostly engaged in normal play activities with the interlocutor(s). All the corpora were transcribed following the CHAT conventions. The data were transcribed orthographically except for some child forms for which a broad phonetic transcription was provided together with the corresponding adult target.

Using the corpora described above, the present study deals with a selection of each of these corpora. The selection was made based on the following rules: (1) spontaneous data from a period of one year was selected for each child; (2) in the case of the bilingual children, only the English data were analyzed since this was the language under consideration in this study; (3) the selected data were divided into two different stages, each of which covers a period of six months; (4) the selected data for each child was matched in terms of MLU values rather than in terms of chronological age. This MLU matching was preferred because it reflects children's language abilities in a more acute way when compared with the chronological age matching. Children's

language development varies in chronological age. Some studies also suggest that bilinguals may demonstrate a slight delay in language milestones when compared with monolinguals (Kehoe 2002, Kehoe, Lleó and Rakow 2004, Bosch and Sebastián-Gallés 2003, Sundara et al. 2006, among others). So MLU matching can ensure that the participants are compared when they are at the same linguistic age. This selection appears in Table 1 for the various MLU ranges of the recordings selected for this study.

Table 1. Age and MLU of the Target Children across the Study Period

Participant	MLU	Age range
<b>Timmy</b>	2.6-3	2;4-2;8
	3-3.7	2;9-3;3
<b>Llywelyn</b>	2.5-3	2;4-2;8
	3-3.6	2;9-3;3
<b>Leo</b>	2.3-2.9	2;8-2;11
	3-3.9	3-3;7
<b>Simon</b>	2.3-3	2;8-2;11
	3-4	3-3;7
<b>Naomi</b>	2.5-3	1;9;12-2;2;0
	3-3.6	2;2;25-2;8;23
<b>Lara</b>	2.6-3	2;4-2;9
	3-3.5	2;10-3;3

From Table 1 it can be known that the acquisition of English of Lara, Timmy and Llywelyn developed at a similar pace with MLU values ranging from 2.6-3.7 at the age of 2;4 to 3;3. On the other hand, Naomi showed a very advanced performance with regard to language development, which can be reflected in the fact that her MLU values reached 2.5-3.6 at the age between 1;9 and 2;8, 7 months in advanced when compared to the three participants that have just been mentioned. What is more, there appears to be a noticeable delay in the acquisition of English of the Spanish-English bilingual twins.

### 5.3 Data Classification

The investigation of the null object phenomenon in child English was carried out in an environment where adult grammar sanctions null objects. Transitive verbs that are obligatorily followed by an overt object in adult English were codified in the available transcriptions of the target children across the one-year investigation period. These obligatorily transitive verbs were subsequently divided into two groups: (1) verbs that take an overt object (either NP or pronominal) and (2) verbs that take an ungrammatical null object according to the adult grammar. Cases of possible null objects were excluded from the codification due to the fact that under certain circumstances null objects are grammatical in English (see section 3.2 above), as shown in (20). Only cases like (21) and (22) were then codified.

(20) I don't know Ø. (possible null object)

(21) I like it.

(22) A: Do you want to eat the apple?

\*B: I don't want to eat Ø. (illicit null object)<sup>3</sup>

In order to provide the most conservative analysis, some utterances were excluded from the count. These include different types, as the examples below in (23-28) illustrate:

(23) MOT: Look what I found. (Lara 2;6;19)

MOT: A pen.

CHI: Look what I found.

(24) CHI: Can I xxx. (Lara 2;6;19)

(25) CHI: I'm looking +/. (Lara 2;6;19)

(Lara corpus, CHILDES)

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<sup>3</sup> In the codification of this type of examples the context was taken into consideration so that cases like that in (22) were codified as "illicit" because they received a specific reading where the verb was transitive (as in 10b above) and not an unergative reading (as in 10a above).

(26) SIM: [^ singing] We won't be back till morning because he told us so. (Simon 3;6;6)

(FerFuLice corpus, CHILDES)

(27) CHI: <I get a witch to> [/] I get a witch to come here. (Timmy 2;9;15)

(Yip-Matthews corpus, CHILDES)

(28) CHI: Get some blue ones. (Lara 2;6;19)

MOT: Pardon?

CHI: Get some blue ones.

(Lara corpus, CHILDES)

Imitations of one of the previous 5 utterances of the interlocutor(s), as in (23), were not considered; neither were partially unintelligible utterances (as in 24), incomplete utterances (as in 25) and routines such as counting, songs and nursery rhymes (as in 26). In the case of immediate repetitions within a single utterance (as in 27) and repetition of the same sentence over a sequence of utterances (as in 28), only one occurrence was counted. In the case of self-repetition with self-correction within a single utterance (as in 27), the one that was counted was always the last instance. In the case of self-repetition of the same sentence over a sequence of utterances (as in 28), only the first one was counted, since they were in fact repetitions of the same sequence.

## 6 Results and Discussion

The results of the data classification are shown in Table 2 for an overall view, and Tables 3 for a more detailed account based on verb type. This division corresponds to a quantitative analysis and a qualitative analysis respectively.

## 6.1 Quantitative Analysis

Table 2 reflects a classification of the selected data in terms of whether the transitive verbs produced were accompanied or not with a direct object.

Table 2. Frequency of \*Null Objects in the Target Children's Corpora

Participant	*Null objects	Transitive verbs	*Null objects%
<b>Timmy</b>	92	655	14.05%
<b>Llywelyn</b>	131	412	31.8%
<b>Leo</b>	16	657	2.44%
<b>Simon</b>	15	649	2.31%
<b>Naomi</b>	48	1175	4.09%
<b>Lara</b>	50	2357	2.12%

The column “\*Null objects” indicates the number of occurrences of illicit null objects according to the adult grammar. The “Transitive verbs” column refers to the number of occurrences of transitive verbs that obligatorily take an overt object according to the discourse context. “\*Null objects%” shows the rate of occurrences of illicit null objects that have appeared in the target children’s English transcriptions within the investigation period.

Although English and Spanish belong to the [- null object] language category, and adult English and Spanish have very strict constraints on implicit objects, the results of the present study have shown that all the six participants produced ungrammatical object omissions in their English output, which is against the postulation that the null object stage is not found in the acquisition of a [- null object] language. This finding concurs with the result of the study by Pérez-Leroux et al. (2008) which provides evidence to support the statement that all children go through a null object stage regardless of the kind of language that they are exposed to. Müller et al. (1996) report that there is a null object stage in the child French of a German-French bilingual child and the following are some examples that they provide:

- (29) Ivar r épare Ø. (Ivar 2;4;9)  
 “Ivar repairs Ø”
- (30) Non maman prend Ø. (Ivar 2;5;7)  
 “No mommy takes Ø”

(Müller et al. 1996: 44)

Non-adult-like null objects are also observed in child Italian (cf. Guasti 1993/1994, Schaeffer 2000) as shown in the following examples:

- (31) No, vuole lavare Ø! (R 2;6)  
 No wants to wash  
 “No, Ø (she) wants to wash Ø (them)”
- (32) No, pettina Ø! (A 2;5)  
 No combs  
 “No, Ø (she) is combing Ø (it)”

(Schaeffer 2000: 78)

What is more, Fujino and Sano’s (2002) study on null objects in child Spanish suggests as well that Spanish-speaking children systematically produce null objects although they are ungrammatical according to the adult grammar.

Consequently, it is reasonable to believe that the null object stage also exists in the acquisition of [- null object] languages and that, as shown in the case of the present study, null objects appear as a developmental feature of child English.

What is more, from Table 1 we know that the MLU of the participants in the present study increased from approximately 2.5 to 4 across the investigation period, from which it can be noted that the target children just began to become sensitive to the relationship between

undergoer omission and discourse context at the starting point of the data range according to Rispoli's (1992) theory. Therefore, it can be expected that the peak of the error rates of null objects produced by the participants will be found in the first few months of the investigation period and then the figures will drop as the children's ability to relate the object omission to the discourse context grew stronger.

Table 3 presents the rates of illicit null objects produced by the six participants when dividing the one-year investigation period into two stages, each of which covers a period of six months. It allows us to take a developmental view on the data.

Table 3. Frequency of \*Null Objects Corresponding to the Two Stages

Participant	*Null Objects%	Age range
<b>Timmy</b>	17.68%	2;4-2;9
	13.18%	2;10-3;3
<b>Llywelyn</b>	33.47%	2;4-2;9
	29.48%	2;10-3;3
<b>Leo</b>	3.68%	2;8-3;1
	1.96%	3;2-3;7
<b>Simon</b>	2.78%	2;8-3;1
	2.09%	3;2-3;7
<b>Naomi</b>	5.41%	1;9-2;2
	2.3%	2;3-2;8
<b>Lara</b>	2.74%	2;4-2;9
	0.78%	2;10-3;3

From Table 3 it can be observed that all the participants' data witness a drop in the average percentages of ungrammatical null objects from stage 1 to stage 2. This result of data classification accords with the expectation derived from Rispoli's (1992) theory.

However, the subjects' performance in the present study is by no means indiscriminate—the results demonstrate an obvious distinction in the percentage of ungrammatical null objects in the participants' English production. As it is shown in Table 2, the rates of omission of

obligatory objects vary wildly depending on the participants and their L1(s): the average percentages of illicit null objects produced by the two Chinese-English bilinguals are 14.05% and 31.8% during the one-year investigation period; those of the two Spanish-English bilinguals are 2.44% and 2.31%; and those of the English monolinguals are 4.09% and 2.12%. What is more, from Table 3 it can be found that the average null objects rate in Timmy's and Llywelyn's data during the first stage are 17.68% and 33.47% respectively, which are much higher than those of the other participants (Leo: 3.68%; Simon: 2.78%; Naomi: 5.41%; Lara: 2.74%). In the subsequent six months, the figures of the Chinese-English bilinguals drop but remain consistently above 7% (Timmy: 7.75%-14.67%; Llywelyn: 18.52%-43.3%), while those of their counterparts from the other two groups are consistently below 5%, ranging from 0% to 4.27%, which suggests almost-adult-like language performances. In addition, the decrease of illicit null objects from stage 1 to stage 2 is more acute in the Spanish-English bilinguals' and the English monolinguals' data than in the Chinese-English bilinguals' data in a general term. This may indicate a negative influence of the Chinese language on the Chinese-English bilinguals' English which delays the participants' English development.

The rate of ungrammatical null objects in Llywelyn's English is much higher than the figure in Timmy's. This is probably due to the fact that, during Llywelyn's early years, his father was occasionally absent from home for three weeks up to half a year. On the other hand, in Timmy's case, he was visited occasionally by his English-speaking relatives and also took several trips to English-speaking countries. This suggests that Llywelyn may have less English input than Timmy so that the influence of Cantonese on the former child's English development is stronger.

The identical twins' English develops in a remarkably similar way. This may result from the fact that since they were born and raised in the same family, their language environment (linguistic input and communicative interaction), which plays a very important role in children's language acquisition as some previous studies suggest (Piaget 1955, Piaget 1971, Slobin 1977, Bates, Bretherton and Snyder 1988, among others), can be regarded as identical.

In the case of the two English monolinguals, the overall percentage of illicit null objects in Naomi's English is higher than that of Lara's. This could be explained by the fact that although Naomi showed an advanced performance in terms of language development, which can be demonstrated in the MLU values, her development in the conceptualization of objects may remain less mature than her language development. This assumption can find evidence in the results of the data classification: the average rate of ungrammatical null objects in Naomi's English at the age of 2;3-2;8 is 2.16%, similar to Lara's figure at the age of 2;4-2;9 (2.74%).

Although there seem to be differences in performance between and within the Spanish-English bilingual group and the English monolingual group, a one-way analysis of variance reveals that these differences are not significant ( $F=0.536$ ,  $p=0.658$ ). The same result happens within the Chinese-English bilingual group ( $F=0.832$ ,  $p=0.363$ ).

On the other hand, the result of an ANOVA of all the six participants' data indicates that the differences of performance between the Chinese-English group and the other two groups are statistically significant ( $F=25.622$ ,  $p<0.001$ ) and that the Chinese-English bilinguals' English production shows strikingly more frequent occurrences of non-target null objects. This result shows positive evidence for the hypotheses (1) and (2) in the present study.

## 6.2 Qualitative Analysis

Apart from these identified quantitative differences, qualitative differences are also observed from the results of the data analyses.

Based on the theoretical description of the issue of verbal transitivity in English in section 3.2, verbs can be divided into three categories according to their transitivity: pure transitive, pure intransitive and mixed, which respectively refer to those verbs which only appear to be transitive, those which only appear to be intransitive and those which can be both transitive and intransitive-like. I classify the transitive verbs found in the present data whose objects should be overtly expressed in the contexts according to the adult grammar but have appeared to take an illicit null object into two groups: pure transitive and mixed as shown in Tables 4.1-4.7.

Table 4.1 presents an overall view of the average percentage of illicit null objects in terms of verb type.

Table 4.1. Average Percentage of \*Null Objects in the Target Children's Corpora

Participant	Pure transitive verbs%	Mixed verbs%
<b>Timmy</b>	32.08%	42.41%
<b>Llywelyn</b>	33%	43.78%
<b>Leo</b>	4.61%	14.3%
<b>Simon</b>	7.68%	10.16%
<b>Naomi</b>	6.02%	8.16%
<b>Lara</b>	6.38%	14.75%

From Table 4.1 it can be easily noted that the average error rates of the pure transitive verbs are noticeably lower than those of the mixed verbs in a general term<sup>4</sup>. This result agrees with Müller's (1998) hypothesis as well as Ingham's (1993/1994) analysis concerning the issue of input ambiguity and language transfer as described in section 3.3. The mixed verbs show

<sup>4</sup> The distinction in figure between pure transitive verbs and mixed verbs may result from the fact that in the language input, those pure transitive verbs do not demonstrate any ambiguity in terms of usage while the mixed verbs are presented in both transitive and intransitive structures, as it was already pointed out above (section 3.3).

different transitivity depending on the discourse context. As Rispoli (1992) points out, on average, children are not able to establish the sensitivity to the relationship between undergoer omission and discourse context until their MLU reaches 2.4 and age reaches approximately 2;3. This is to say, before they achieve the required MLU level, children will not be able to associate the undergoer omission with discourse conditions. So if a verb appears as both transitive and intransitive-like in the language input, children will encounter great difficulty in distinguishing the different situations and thus fail to use the verb appropriately in their language output. This result provides positive evidence for the fourth hypothesis of the present study.

Tables 4.2-4.7 deal with the six participants' data individually, which allows us to carry out further qualitative analyses of the data on the topic under investigation. The classification of the data in these cases have been done not only in terms of verb type (pure transitive versus mixed verbs) but also in terms of verbal lexicon, that is, in terms of the specific individual verbs used by the children. This provides us with a more detailed account of each target child's English production.

The English data from the two Chinese-English bilingual participants appear in Tables 4.2 and 4.3.

Table 4.2. Frequency of \*Null Objects in Timmy's Corpus

Pure transitive verbs	*Null objects%	Tokens	Mixed verbs	*Null objects%	Tokens
<b>*wipe</b>	100%	1/1	<b>*drop</b>	100%	1/1
<b>*bring</b>	100%	1/1	<b>*cook</b>	100%	1/1
<b>put</b>	34.62%	18/52	<b>*hear</b>	100%	1/1
<b>take</b>	30%	6/20	<b>*touch</b>	100%	2/2
<b>find</b>	28.57%	4/14	<b>*drive</b>	100%	1/1
<b>make</b>	18.18%	2/11	<b>*hold</b>	66.67%	2/3
<b>send</b>	16.67%	1/6	<b>cut</b>	57.14%	4/7
<b>want</b>	8%	2/25	<b>catch</b>	57.14%	4/7
<b>get</b>	5.8%	4/69	<b>*swallow</b>	33.33%	1/3
<b>like</b>	5.56	3/54	<b>tell</b>	28.57%	2/7
<b>have</b>	5.45%	3/55	<b>open</b>	27.27%	3/11
			<b>ride</b>	27.27%	3/11
			<b>*push</b>	25%	1/4
			<b>save</b>	20%	2/10
			<b>ask</b>	14.29%	1/7
			<b>play</b>	16.67%	2/12
			<b>eat</b>	15.15%	10/66
			<b>do</b>	11.11%	1/9
			<b>see</b>	11.11%	1/9
			<b>bite</b>	8.33%	1/12
			<b>shoot</b>	8%	2/25
			<b>break</b>	5.88%	1/17

The verbs that take a “\*” symbol have appeared less than 5 times in total in the available data across the investigation period, which I consider quantitatively insufficient to be analyzed individually and thus the percentage of null objects of these verbs should not be taken into account. The column “\*Null objects%” indicates the percentage of illicit null objects taken by each verb. “Tokens” refers to the occurrences of each verb that is followed by an ungrammatical null object among its total occurrences in the available data.

Table 4.3. Frequency of \*Null Objects in Llywelyn's Corpus

Pure transitive verbs	*Null objects%	Tokens	Mixed verbs	*Null objects%	Tokens
<b>*press</b>	66.67%	2/3	<b>*pull</b>	100%	1/1
<b>put</b>	63.29%	50/79	<b>*throw</b>	100%	2/2
<b>make</b>	54.55%	6/11	<b>hear</b>	80%	4/5
<b>want</b>	45.45%	5/11	<b>try</b>	72.43%	5/7
<b>build</b>	37.5%	3/8	<b>watch</b>	60%	6/10
<b>carry</b>	28.57%	2/7	<b>open</b>	58.33%	7/12
<b>like</b>	22.22%	6/27	<b>cut</b>	40%	4/10
<b>take</b>	20%	1/5	<b>break</b>	37.5%	3/8
<b>need</b>	12.5%	1/8	<b>*bite</b>	33.33%	1/3
<b>find</b>	12.5%	1/8	<b>*play</b>	33.33%	1/3
<b>get</b>	2.57%	1/27	<b>eat</b>	28%	7/25
			<b>see</b>	25%	6/24
			<b>close</b>	20%	2/10
			<b>hold</b>	16.67%	1/6
			<b>drink</b>	14.29%	1/7
			<b>wash</b>	14.29%	1/7
			<b>read</b>	11.11%	1/9

All the illicit null object structures in English that have been presented in Tables 4.2 and 4.3 can find their parallel structures in Chinese in which they find themselves legitimate according to the Chinese adult grammar, as the following instances show:

(33a) \*CHI: take Ø out. (Timmy 2;4;28)

(33b) lo1 ceot1 lai4

(34a) \*CHI: I didn't find Ø. (Timmy 2;4;28)

(34b) ngo5 wan2 m4 dou3\*2

(35a) \*CHI: I cut Ø. (Llywelyn 2;10;4)

(35b) ngo5 cit3

(36a) \*CHI: you cannot eat Ø. (Llywelyn 2;10;4)

(36b) nei5 m4 ho2 ji5 sik6

(Yip-Matthews corpus, CHILDES)

In examples (33)-(36), sentences (a) are taken from Yip-Matthews corpus in CHILDES. Sentences (b) are the Cantonese equivalences of (a). All the four sentences (a) are found ungrammatical due to the absence of an obligatory object when put in the discourse context established between the participants and the interlocutor(s). However, it is observed that the structure of sentences (a) is considered legitimate according to the Chinese grammar. Therefore, when sentences (a) are translated into Chinese, preserving the original structure (as shown in sentences (b)), they are regarded to be grammatical.

Furthermore, in the corpora of Timmy and Llywelyn, among the most frequent verbs that take an obligatory object, the verb *put* stands out as taking an ungrammatical null object at a fairly high rate (34.62% and 63.29% respectively) whereas other verbs vary a lot in their frequency in this respect. The illicit use of the verb *put* produced by the two Chinese-English target children is demonstrated in examples (37)-(40):

(37) CHI: Ø (it) is here, put Ø here. (Timmy 2;4;14)

(38) INV: Why does he want to put on his helmet? (Timmy 2;5;5)

CHI: Put Ø in the boat.

(39) Don't put Ø here! (Llywelyn 2;8;8)

(40) INV: Where is it? (Llywelyn 2;11;29)

CHI: I put Ø here.

(Yip-Matthews corpus, CHILDES)

The sentential pattern of examples (37)-(40) in which the non-target-like structure whereby *put* is directly followed by a locative as an obligatory complement is very similar to the structure of the Chinese language as demonstrated in the following two examples:

(41) baai2 (hai2) li1 dou6. (put at here)

“Put Ø (it) here.”

(Yip and Matthews 2005: 2426)

(42) ngo5 fong3 (hai2) soeng6 min6. (I put at top)

“I put Ø (it) on Ø (the) top.”

Such null-object structures are very common in Chinese and can be found abundantly in the target children’s Cantonese production within the parallel time frame (2;4-3;3). The following are two examples:

(43) CHI: baai2 ji1 dok6. (put at here) (Timmy 2;4;14)

“Put Ø (it) here.”

(44) CHI: fong3 nei1 dou6 aa3. (put here) (Llywelyn 2;7;4)

“Put Ø (it) here.”

(Yip-Matthews corpus, CHILDES)

All these evidences suggest that it is very likely that in the Chinese-English bilinguals’ language acquisition process, the null object mechanism in the Chinese language serves as the basis for the object specification in English, that is, that there is language transfer from Chinese into English in this respect.

The data from the Spanish-English bilingual children appear in Tables 4.4 and 4.5 below.

Table 4.4. Frequency of \*Null Objects in Leo’s Corpus

Pure transitive verbs	*Null objects%	Tokens	Mixed verbs	*Null objects%	Tokens
<b>pick</b>	12.5%	1/8	<b>*hit</b>	33.33%	1/3
<b>put</b>	4.23%	3/71	<b>cut</b>	33.3%	2/6
<b>find</b>	4%	1/25	<b>help</b>	11.11%	1/9
<b>like</b>	3.03%	1/33	<b>see</b>	3.23%	1/31
<b>have</b>	2.74%	2/73	<b>eat</b>	3.13%	1/32
<b>want</b>	1.16%	1/86	<b>do</b>	1.72%	1/58

Table 4.5. Frequency of \*Null Objects in Simon's Corpus

Pure transitive verbs	*Null objects%	Tokens	Mixed verbs	*Null objects%	Tokens
<b>pick</b>	20%	1/5	<b>cut</b>	16.67%	1/6
<b>find</b>	9.09%	1/11	<b>see</b>	10.87%	5/46
<b>put</b>	5.56%	3/54	<b>do</b>	2.94%	1/34
<b>like</b>	2.33%	1/43			
<b>want</b>	1.44%	2/139			

From Tables 4.4-4.5 it can be noted that there is no verb whose percentage of errors stands out as taking an illegitimate null object with high frequency in both participants' data, and that all the verbs vary in their frequency of taking an illicit null object. This lack of consistency indicates that the usage of these verbs with regard to object realization in Spanish, which is very similar to that in English, may not have a significant influence on the two Spanish-English bilingual participants' English production.

Tables 4.6 and 4.7 show the data from the two English monolingual children.

Table 4.6. Frequency of \*Null Objects in Naomi's Corpus

Pure transitive verbs	*Null objects%	Tokens	Mixed verbs	*Null objects%	Tokens
<b>put</b>	12.86%	9/70	<b>leave</b>	14.29%	1/7
<b>like</b>	6.78%	4/59	<b>wash</b>	13.33%	4/30
<b>get</b>	5.68%	5/88	<b>push</b>	13.04%	3/23
<b>find</b>	4.76%	4/30	<b>close</b>	10%	1/10
<b>have</b>	3.51%	2/57	<b>throw</b>	9.09%	1/11
<b>want</b>	2.53%	4/158	<b>drop</b>	6.67%	1/15
			<b>do</b>	6.67%	4/60
			<b>drink</b>	6.45%	2/31
			<b>eat</b>	6.38%	3/47
			<b>turn</b>	6.25%	1/16
			<b>draw</b>	3.7%	1/27
			<b>see</b>	2.17%	1/46

Table 4.7. Frequency of \*Null Objects in Lara's Corpus

Pure transitive verbs	*Null objects%	Tokens	Mixed verbs	*Null objects%	Tokens
<b>reach</b>	22.22%	2/9	<b>bang</b>	40%	2/5
<b>put</b>	5%	10/200	<b>*catch</b>	33.33%	1/3
<b>take</b>	1.79%	1/56	<b>watch</b>	25%	3/12
<b>get</b>	0.99%	2/202	<b>fold</b>	20%	1/5
<b>make</b>	0.84%	1/119	<b>cut</b>	15.79%	3/19
<b>have</b>	0.32%	1/315	<b>see</b>	13.79%	4/29
			<b>finish</b>	13.33%	2/15
			<b>pour</b>	12.5%	1/8
			<b>throw</b>	11.11%	1/9
			<b>tell</b>	6.25%	1/16
			<b>read</b>	5.26%	2/38
			<b>give</b>	4.17%	1/24
			<b>do</b>	3.42%	10/292
			<b>play</b>	2.56%	1/39

Tables 4.6-4.7 show that there is no common verb that distinguishes itself as taking an illicit null object with high frequency in Naomi's and Lara's data either. This suggests that although the null object stage exists in the development of language acquisition of English monolinguals, which specific verbs tend to take an ungrammatical null object more frequently may vary from individual to individual.

When analyzing the data by means of a developmental approach with division of the one-year investigation period into two stages of six months respectively, no verb stands out as taking an ungrammatical null object with high frequency in the two Spanish-English bilingual participants' data neither in stage 1 nor stage 2. Neither does this show in the two monolingual English-speaking participants' data. Meanwhile, the verb *put* in the two Chinese-English bilingual participants' data distinguishes itself in both stage 1 and stage 2 by appearing to be used illicitly with regard to object realization. This can be noted from Table 5, which shows the

rates of ungrammatical null object structure of the verb *put* produced by the Chinese-English bilingual target children in the present study:

Table 5. Frequency of \*Null Object Structure of *Put* Corresponding to the Two Stages

Participant	*Null Objects%	Age range
<b>Timmy</b>	53.85%	2;4-2;9
	15.38%	2;10-3;3
<b>Llywelyn</b>	63.89%	2;4-2;9
	57.14%	2;10-3;3

The qualitative analysis above indicates that the Chinese-English bilinguals' illicit production concerning the issue under consideration shares some common characteristics in terms of verb type while the production of the other groups shows no common mistake in this respect. What could be inferred from this is that the Chinese null object pattern has an impact on the Chinese-English bilinguals' English output. This assumption could be further supported by the fact that the typical and legitimate structures of some verbs in Chinese find their equivalent structures in the target children's English in which they become ungrammatical according to the standard grammar of the English language, which make the error rates of these verbs stand out. This result supports hypotheses (1) and (2) in the present study from a qualitative perspective.

### ***6.3 Language Transfer from Chinese into English***

The results of the data classification and analysis presented above also provide positive evidence for Müller's (1998) hypothesis about language transfer. On the one hand, from Table 2 we know that the figures of the illicit null object rates produced by the Spanish-English bilinguals show no significant difference from that produced by the English monolinguals whereas the figures of the Chinese-English bilinguals noticeably outstrip those of the other two groups. On the other hand, Tables 4.2-4.7 demonstrate that most of the verbs that appear to take

an ungrammatical null object in the Chinese-English bilinguals' data can also be found their illegitimate usage in terms of object realization in the other two groups' data although their error rates might vary and are certainly lower.

The illicit null objects produced by the Spanish-English participants and the English monolingual participants suggest that the syntactic construction of these verbs in English may call for more than only one grammatical analysis from the perspective of child grammar: the child needs to simultaneously determine lexical frames and formulate the target grammar for null object licensing. On the other hand, Chinese language allows null objects in a much more unrestricted manner: after the first appearance of a sequence of an identical object, the subsequences can be either overtly expressed (in the form of either NP or pronoun) for purposes of clarity, emphasis or contrast, or phonetically deleted as long as their reference can be recovered from the discourse context, which is more commonly practiced. Moreover, English and Chinese sentences share the same general pattern: the complement is placed after the verb. So, under the eyes of the child, the syntax in the English and the Chinese input is compatible with the English grammar as well as the Chinese grammar. As a result, it is very likely that Chinese-English bilingual children will assume that the Chinese grammar applies to both English and Chinese and likewise the English grammar. What can be inferred from this assumption is that Chinese contains positive evidence for the possible analysis which directs to an unexpressed object in the English output. When bilingual children produce utterances in English, especially with the mixed verbs, based on the English grammar, they will have to perform both syntactic and lexical analyses in order to achieve the target form. On the contrary, the loose regularities with respect to object realization in Chinese involve much less computational processing effort. Not being fully competent to map the universal strategies onto language-specific rules as quickly

as the Spanish-English bilinguals and the English monolinguals whose L1(s) only offer(s) a single strategy to deal with the question of object realization, Chinese-English bilinguals confront with a much wider range of language-specific syntactic possibilities. As a consequence, they may resort to parts of the Chinese analysis as a relief strategy in order to deal with the ambiguity of the discussed issue in English. That is why transfer arises, and thus the null object sentential pattern in Chinese can be found in the English output of the Chinese-English bilinguals. This analysis is in support of hypotheses (3) and (4) in the present study.

In the light of the data analyses above, all the five hypotheses of the present study are found fully favorable from both quantitative and qualitative perspectives.

## **7 Conclusions**

The present study compares the performance of two Chinese-English bilingual children, two Spanish-English bilingual children and two English monolingual children in object realization. It provides new evidence to support the hypothesis that the development of the two languages in early bilingual children follows different but interrelated paths and so languages influence each other in certain ways. What is more, it has allowed us to observe the role of crosslinguistic influence in child English output.

The results show that Timmy and Llywelyn, the Chinese-English bilinguals, produced significantly more ungrammatical object-drop sentences than the other participants in the study when they were at a similar linguistic age (according to MLU values). Moreover, longitudinally, while the Spanish-English bilinguals and the English monolinguals performed almost adult-like in terms of object realization with error rates consistently lower than 5%, the figures of the Chinese-English participants remained comparatively high. Apart from this, there are some

common characteristics in the Chinese-English target children's illicit production of null objects in English in terms of verb type while no such common feature is found in the other two groups' illegitimate null object production. Furthermore, typical and grammatical structures of certain verbs in Chinese find their parallel structures in the target children's illicit English null object production, which serves as evidence of the impact of the Chinese null object mechanism on the Chinese-English bilingual children's English.

In terms of object realization, the Spanish-English bilinguals did not show any significant difference in performance when compared to the English monolinguals, while the performance of the Chinese-English bilinguals varied substantially from the other four participants in the study. This indicates that it is not necessarily true that bilingual children produce more ungrammatical object omissions in their English output than monolinguals; but rather, their performance is highly related to the type of L1s that they speak.

Spanish and English are [- null object] languages. Although Spanish-English bilinguals and English monolinguals go through a period when object-drop sentences also appear in their language output, they stop producing this kind of errors within a comparatively short time. Spanish-English bilinguals do not show any delay in reaching adult targets with regard to the issue under analysis in comparison to their English monolingual counterparts<sup>5</sup>. However, the Chinese object-drop mechanism seems to have a great impact on Chinese-English bilingual children's English. This suggests that, in a general term, bilinguals are not less efficient in language development even though they have to deal with two sets of syntax at the same time. But under the circumstance where the two sets of syntax are greatly different from each other, it is very likely that one of them will be influenced by the other.

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<sup>5</sup> When the Spanish-English bilingual participants' English output reaches the same MLU value as that of the English monolingual participants, their performances in terms of object realization are very similar to those of the English monolinguals.

There are several limitations in the present study. Further research will have to address two issues: 1) to what extent the usage of pure transitive verbs and mixed verbs in the English language input influences the children's English output; and 2) how the object realization mechanism functions in Spanish and to what extent this mechanism is similar to that in the English language. These future works could provide further insights into the bilingual language faculty, the role of transfer and the role played by the English and Spanish languages and their specifications regarding the issue of object realization.

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