

AN ANALYSIS OF INTERLINGUISTIC INFLUENCE FROM CHINESE INTO ENGLISH IN DIRECT OBJECT REALIZATION IN CHINESE-ENGLISH BILINGUAL CHILDREN

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Abstract

While null objects are possible and pervasive in Chinese, their occurrence in languages like English and Spanish is rather restricted. In the case of developing grammars, the omission of categories that characterizes the initial stages of acquisition also affects the object category, together with inflection, subjects, determiners, etc. The main goal of this article is to investigate the nature of interlinguistic influence from Chinese into English in a set of Chinese-English (C-E) bilingual children with a focus on bilingual children's early direct object (DO) realization in English and to provide new empirical evidence for the postulation that the development of the two languages is interdependent. In order to do so, a comparative study has been carried out: the English production of C-E bilinguals is analysed with regard to DOs and, in order to determine whether the possible overproduction of null DOs is due to influence from the other first language (L1) (i.e. Chinese) or is rather part of the developmental process, a double comparison is established with English monolinguals (E monolinguals) and with Spanish-English bilinguals (S-E bilinguals). The results show that C-E bilinguals' performance in terms of DO realization in English is significantly different from that of both E monolinguals and S-E bilinguals and that the latter two groups behave similarly. This finding supports the conclusion that, although null DOs occur in the initial stages of child language acquisition regardless of whether the adult grammar allows them (Chinese) or not (English and Spanish), in the case of C-E bilinguals' English development, interlinguistic influence from Chinese into English has a negative effect as reflected in null DOs being produced at a higher rate and until later in life.

Keywords: English, bilingual acquisition, null object, interlinguistic influence, null object language, early language acquisition.

Resumen

La omisión de objetos es una propiedad gramatical muy frecuente en chino, mientras que en inglés y en español su uso está más restringido. En este trabajo analizamos la omisión de los objetos que producen en inglés los siguientes grupos: niños bilingües chino-inglés, español-inglés y monolingües inglés. Evaluamos hasta qué punto el mecanismo del objeto nulo en chino influye en el desarrollo del inglés de niños bilingües chino-inglés. Para ello, ofrecemos un estudio comparativo doble: por un lado, entre la producción de los niños bilingües chino-inglés y la de los monolingües inglés, con el fin de determinar si la omisión de objetos caracteriza la adquisición tanto de la gramática monolingüe como de la bilingüe; y, por otro lado, entre dicha producción de los niños bilingües chino-inglés y la de los niños bilingües español-inglés, para establecer si las gramáticas bilingües son paralelas en su desarrollo. Los resultados demuestran que existe una

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diferencia significativa entre la producción y el desarrollo gramatical de los bilingües chino-inglés y los de los otros dos grupos con respecto al uso de objetos, lo cual respalda la conclusión de que, aunque el mecanismo de objeto nulo es una propiedad de las gramáticas en desarrollo, en el caso del inglés de niños bilingües chino-inglés, se produce una interferencia negativa del chino en el inglés que se manifiesta en un mayor uso de objetos nulos en inglés y hasta etapas posteriores.

Palabras clave: inglés, adquisición bilingüe, objeto nulo, influencia interlingüística, lenguas de objeto nulo, adquisición temprana del lenguaje.

INTRODUCTION

Regarding bilingual acquisition there is a general consensus that bilingual children establish two separate language systems at the very initial stages of language acquisition (Genesee 1989; Meisel 1989; De Houwer 1990; Genesee *et al.* 1995, among others) captured in the so-called Language Differentiation Hypothesis. However, how the interaction between the two languages takes place along the developmental process remains a matter of debate: whether the development of one language may influence the development of the other (Interdependent Development Hypothesis) (Cummins 1979, 1991; Bernhardt and Kamil 1995; Döpke 2000; Hulk and Müller 2000; Van Gelderen *et al.* 2004; Serratrice; Sorace and Paoli 2004, among others) or whether the development of each language is comparable to the development in the corresponding monolinguals (Autonomous Development Hypothesis) (De Houwer 1990; Paradis and Genesee 1996; Meisel 2001, among others).

The goal of the present study is to provide new empirical evidence for the postulation that the development of the two languages is interdependent and so that the development of the bilingual system occurs in such a way that the two languages influence each other. In particular, and within the context of the Interdependent Development Hypothesis, this study focuses on how bilingual children with one of the L1s allowing null DOs (Chinese) and the other not allowing them (English) respectively acquire and produce DOs in English. To be more specific, the English production of a set of C-E bilinguals is studied in order to determine whether there is interlinguistic influence from Chinese and, if there is, how it is materialized. Interlinguistic influence could be reflected in the overproduction of null DOs in English due to the influence from Chinese.

In the case of null DOs, interlinguistic influence should be distinguished from the null-object stage that is part of the language acquisition developmental process. For this reason, the C-E bilinguals' performance in DO realization in English is compared to that of both the E monolinguals and the S-E bilinguals (Spanish showing a similar DO realization mechanism to that of English). If, in the case of DO production in English, the S-E bilinguals and the E

monolinguals show a comparable performance in terms of DO realization and both groups differ from that of the C-E bilinguals', it will indicate that this difference does not result from either the null-object stage in language acquisition or the fact of being bilingual (i.e. the so-called bilingual effect: delay is induced by the reduced input of each L1) but it is very likely that it is due to the influence from Chinese into English.

In order to address the issues above with respect to the nature of interlinguistic influence as reflected in the DO category, the production of the C-E bilinguals is analysed through a comparison concerning children's early DO realization in naturalistic English data. The study involves data from ten children: five C-E bilinguals, three E monolinguals and two S-E bilinguals. This selection is made in terms of the longitudinal data available in the CHILDES (Child Language Data Exchange System) project (MacWhinney 2000).

The present work is organized as follows. Section 1 addresses the distribution of overt and null DOs in the three languages involved in the present work (i.e. English, Chinese and Spanish). Section 2 is concerned with the relevant notions regarding bilingual acquisition as well as a description of how objects and object properties are acquired by monolingual and bilingual speakers. In section 3, the methodology of the present work is presented. Section 4 provides an analysis of the DOs produced by the participants in the present study. Section 5 presents the conclusions drawn from the data analysis in which some relevant questions are proposed for further research.

1. THE DISTRIBUTION OF OVERT AND NULL OBJECTS IN ENGLISH, CHINESE, AND SPANISH

In terms of the nature of objects, languages are classified as [+ null object] languages and [- null object] languages. However, although English and Spanish are considered as [- null object] languages and Chinese as a [+ null object] language, null DOs can be found in the three languages, as shown in (1).

- (1) a. I've eaten *e*.
- b. He comido *e*.
 have eaten
 "I've eaten."
- c. Wo chi le *e*.
 I eaten
 "I've eaten."

The verb *eat* in all three sentences in (1) takes a legitimate null DO respectively, one that is non-specific and non-individuated. Nevertheless, null pronouns in object position in English and Spanish are subject to a number of restrictions when compared to Chinese: in English and Spanish, the referent of the null DO has to be non-specific and non-individuated, while no such restriction is required in Chinese. In other words, the distribution of null DOs in English and Spanish is different from that in Chinese. The examples in (2) show both possible and non-possible contexts for the appearance of null DOs in English and Spanish:

- | | |
|--|---|
| (2) a. I see him. / John said I saw him. | Lo veo. / Juan dice que lo ví. |
| b. This is John _i . *I see e _i . / *John _i said I saw e _i . | Juan _i está aquí. *Veo e _i . / *Juan _i dice que ví e _i . |
| c. This is John _i . *I prefer not to see e _i . / *I prefer seeing e _i . | |
| d. I see e. | Ya veo e. |
| e. We will eat e at four. | Comeremos e a las 4. |

As shown in (2d) and (2e), an empty pronoun *e* may appear as a DO in English and in Spanish. However, when the DO is null, it may indicate a change in the meaning of the sentence, as in (2d), whose interpretation is not “I see something,” but rather “I understand something.” Another possibility for null DOs in these two languages is that the referent of such objects is non-specific and non-individuated, as in (2e). Outside the scope of these restrictions, DOs must be overtly realized, as in (2a). Regardless of whether they appear in a main clause (2a) or in a subordinate clause (2b, c), and regardless of whether the subordinate clause is tensed (2b) or non-tensed (2c), null DOs will result in the ungrammaticality of the sentence.

However, all the possibilities for null and overt DOs in (2) above are in fact grammatical in Chinese, as shown in (3).

- (3) a. wo kanjian ta le. / Zhangsan shuo wo kanjian ta le.
I saw him // Zhangsan said I saw him
“I saw him.” / “Zhangsan said that I saw him.”
- b. wo kanjian e_i le. / Zhangsan shuo wo kanjian e_i le.
I saw // Zhangsan said I saw
“I saw him.” / “Zhangsan said that I saw him.”
- c. wo ningyuan bu jian e_i.
I prefer no see
“I prefer not seeing / to see him.”
- d. women si dian chi e.
we at four eat
“We’ll eat at four.”

In (3), all the sentences are acceptable. That is, DOs in Chinese could be overt, as in (3a), or null, as in (3b, c, d); null DOs do not change the meaning of the sentence, as shown in (3a) and (3b), which have the same meaning, regardless of whether the DO is overt (3a) or null (3b); the referent of the null DO in Chinese can be referential and individuated, as in (3b, c), or non-specific and non-individuated, as in (3d); null DOs can appear either in a main clause or in a subordinate clause (3b).

The distribution of null DOs in Chinese (3) forms a sharp contrast with that in English and Spanish (2). English and Spanish require DOs to be mainly overt while Chinese exhibits maximal freedom in the use of null DOs.

Tsao (1979) and Huang (1982, 1984) explain the difference between Chinese and English and Spanish in terms of the distribution of null DOs by distinguishing between sentence-oriented languages and discourse-oriented languages. According to these two researchers, English and Spanish are sentence-oriented languages while Chinese is a discourse-oriented language. Discourse-oriented languages have a rule of topic-chaining (TC) by which the discourse topic is grammatically linked to a null sentence topic *e*, which in turn identifies a null argument. This null argument is a variable left from the movement of the empty topic, as illustrated in (4).

- (4) a. [*Discourse Topic*_i [_{CP} *e*_i lai le]].
 came
 “He came.” (Huang 1984: 537)
- b. [*Discourse Topic*_i [_{CP} Zhangsan bu renshi *e*_i]].
 Zhangsan no know
 “Zhangsan doesn’t know him.”

In (4), supposing that the discourse topic is *ta* (“he”), such topic is linked to a null sentence topic *e* and serves as the referent for the null argument *e* in both (4a) and (4b). So the value of the null argument *e* in (4) can be recovered through the discourse topic, which can in turn be overt (*ta* (“he”)) or null (as in 4). The null argument can appear in either the subject position (4a) or the object position (4b).

Another property of discourse-oriented languages is topic-prominence (Li and Thompson 1976), which refers to the fact that structures are organized in terms of topicality rather than syntactic function and so the central element is the topic (the discourse notion) rather than the subject (the syntactic notion). This means that, while in subject-prominent languages (that Huang referred to as sentence-oriented languages, as pointed out above), such as English and Spanish, structures are organized in terms of syntax (subject-verb-object), in topic-prominence (or discourse-oriented) languages like Chinese, sentences are

structured in terms of the topic (i.e. the person/thing that is predicated) and the comment (i.e. the information provided about the topic).

To sum up, on the one hand, in Chinese the nature of DOs as null or overt is linked to its topic-prominence property, which is attributed to the discourse-oriented feature in such language. This makes TC formation a defining property of the Chinese language and the locus of the availability (and frequency) of null DOs: the referential content of the null DO is recovered within the same TC. On the other hand, since English and Spanish are sentence-oriented languages, no TC can be formed. Therefore, the value of a null DO cannot be recovered from the discourse context. This is the reason why a null DO whose referent is specific and individuated becomes ungrammatical.

2. THE ACQUISITION OF DOs

2.1 The acquisition of objects by monolinguals

Crosslinguistically, child language at the early stages of acquisition is characterized by the use of null categories in general and null arguments in particular (e.g. subjects, objects, determiners, etc.). Four main explanations have been proposed to account for the null object phenomenon, including children's performance limitations (Valian 1991), children's ability to associate discourse contexts with the realization of objects (Rispoli 1992), influence from language input (Ingham 1993), and children's null cognate object default strategy (Pérez-Leroux; Pirvulescu and Roberge 2008).

Valian's (1991) study on children aged from 1;10 to 2;08 in the US has found an increase in the use of pure transitive verbs (i.e. verbs that must take an overt DO) as well as of overt objects with mixed verbs (i.e. verbs that can take either overt or null objects, as *see* or *eat* in (2) above) as the children get older. The researcher argues that this is best understood as a decrease in performance limitations: children are able to recognize the difference between pure transitive verbs and intransitive verbs (i.e. verbs that must not take an object); and they also recognize mixed verbs. 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. Overt objects are always required with pure transitive verbs, but the children have the option of using more intransitive and mixed verbs to get around the cognitive load that an additional constituent would appear to impose. As the children can handle longer

sentences, they increase their use of overt objects with mixed verbs as well as their use of pure transitive verbs.

While Valian (1991) attributes object omission in early child English to performance limitations, Rispoli (1992) argues that children's object realization is related to their ability to associate the realization of objects with discourse conditions. As discussed in section 1, in [- null object] languages such as English and Spanish, the presence of overt and null objects is an issue which involves syntax, semantics and pragmatics: when the referent is specific/individuated, the object has to be overtly presented; when the referent is non-specific and non-individuated, the object should be null. This is to say, when a child encounters a mixed verb, he or she must still discover which semantic and pragmatic features constrain the interpretation of the overt or null object. Settling on the wrong motivation would lead to ungrammatical pairings of the object to the discourse-pragmatic context. Rispoli (1992) conducts a study on the acquisition of overt and null objects in English with a mixed verb. i.e. *eat*, on forty English-speaking children aged from 1;00 to 3;00 in order to examine children's sensitivity to the relationship between null arguments and discourse context. The results of Rispoli's (1992) study show evidence for the establishment of sensitivity between object realization and discourse context at a mean age of 2;03 and a mean MLU of 2.4.

Ingham (1993) investigates the relation between the argument frames used in the adult input and children's acquisition of verb syntax through two studies of children's acquisition of verb transitivity, study 1 using spontaneous language data and study 2, experimental data. From the two studies the author argues that a clear relationship between object realization with transitive verbs (both mixed and pure transitive) in the input to children and children's own object realization with such verbs is shown. The speech of children acquiring the lexical representation of null objects in English reliably reflects item-specific syntactic evidence in the input. To be more specific, children are significantly less likely to produce null objects when input provides no positive evidence of null objects (i.e. pure transitive verbs) than they are when input offers them such positive evidence (i.e. mixed verbs). In other words, input can constrain the acquisition of verb argument structure. In particular, children's production of an overt or a null object after a verb does not derive from its semantic-selection, but is rather strongly influenced by the input.

Pérez-Leroux, Pirvulescu and Roberge (2008) hold a different view on young children's object production. The researchers argue that young children do not avoid providing structures that they cannot find in the input. To account for young children's preference for null arguments over other object configurations in language production, the three researchers assume that children start out with a null cognate object default. That is, the grammar starts

with an all-purpose null object N which is capable of referential features. This means that the initial referential properties of the null cognate object are broader than in the target grammar. Through experience, children learn that null objects have more restrictive semantics in a language like English, limited to non-specific and non-individuated null objects, and thus the referential semantics of the null default is blocked. In other words, children set parameters (either [+null object] or [-null object]) early, and developmental changes in various modules of the grammar (morphology, syntactic computations, syntax-pragmatics interface) account for the object optionality phase.

2.2 Bilingual acquisition and objects

With respect to bilingual acquisition, and according to the generally accepted view, children who acquire two languages simultaneously possess two language systems from the initial stages of acquisition. Some researchers have supported the Autonomous Development Hypothesis (De Houwer 1990; Paradis and Genesee 1996; Meisel 2001, among others) in which the language developmental pattern in bilingual children is said to assimilate that of monolinguals. Other researchers favour the Interdependence Hypothesis (Müller 1998; Yip and Matthews 2000, 2005, among others) in which bilingual children's two languages can have signs of interlinguistic influence. Such influence may manifest itself in three potential ways: acceleration, delay, or transfer (Paradis and Genesee 1996).

First of all, interlinguistic influence from one language into the other could accelerate the acquisition of certain properties in one of the languages of the bilingual. Acceleration refers to the fact that, if a certain property emerges earlier in grammar A, this could trigger the acquisition of this specific property in grammar B and, as a result, it will appear in the bilingual grammar B earlier than it would be the norm in the monolingual acquisition of B. In contrast, it is also possible that the burden of acquiring two languages could slow down the acquisition process in bilingual children, causing them to be behind monolinguals in their overall progress in terms of grammatical development (i.e. the so-called bilingual effect). In other words, bilinguals may acquire a given construction later in development than monolinguals. The third potential manifestation of interlinguistic influence is transfer, which consists of the incorporation of a grammatical property from language A into language B. In this case, bilinguals pass through stages of linguistic development that monolinguals do not.

Understanding interlinguistic influence in the domain of syntax requires the identification of the conditions under which one developing grammar

influences the development of the other grammar. On the one hand, according to Hsin (2012), acceleration may occur if there are identical syntactic structures available that allow bilinguals to bootstrap one of their grammars onto the other, so that the more advanced system will boost the development of the less advanced one. On the other hand, delay may occur in the domains in which the two grammar systems have similar but conflicting structures (Hulk and Müller 2000; Hsin 2012), which causes bilingual children to produce adult-like utterances later in development than when compared to their monolingual counterparts. Furthermore, delay may occur due to the fact that bilingual children have received less input in each language than monolinguals (De Houwer 1990; Gathercole 2007). With respect to transfer, it may be the consequence of the following factors: (i) the typical maturational schedule is different in each of the languages of the bilingual; (ii) one of the languages of the bilingual is more dominant than the other (Paradis and Genesee 1996); and (iii) a certain domain shares similar but conflicting structures in a bilingual child's two languages; such structures in one language, termed vulnerable domains by Müller (2003), may be less straightforward than those in the other language, and may involve a challenge even in monolingual acquisition (Hulk and Müller 2000; Müller 2003); in this case, transfer may occur from the language without ambiguity to the one with ambiguity.

In terms of DO acquisition in bilingual children, different results are found. Serratrice, Sorace and Paoli (2004) investigate an Italian-English bilingual child's performance in the domain of DO production and find comparable results in the bilingual child's two L1s as those of monolingual children in their respective language. Yip and Matthews' (2005) study on C-E bilinguals and Paradis, Crago and Genesee's (2006) study on English-French bilinguals have found possible language transfer from the bilinguals' one language into another. What is more, Müller and Hulk (2001), Pérez-Leroux, Pirvulescu and Roberge (2009) and Pirvulescu *et al.* (2014) have found a delay effect in bilingual children in the domain of DOs and explain such an effect as a default retention. Müller and Hulk (2001) attribute such retention to the indirect influence from one language into the other while Pérez-Leroux, Pirvulescu and Roberge (2009) and Pirvulescu *et al.* (2014) argue that it is the result of limited input and higher complexity in bilingual children's input.

3. METHODOLOGY

3.1 Research objectives and hypotheses

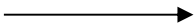
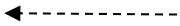
Taking as a point of departure previous work on the analysis of DOs, the present research is concerned with interlinguistic influence from Chinese into English in the domain of DO realization and aims to offer a characterization of DOs in the English spontaneous production of C-E bilinguals. The possible overproduction of null DOs in child bilingual English due to influence from the null DO characteristics in Chinese has been and continues to be investigated. To this date, although interlinguistic influence has been reported in previous works (Yip and Matthews 2005), various unsolved questions remain concerning the issue, such as the role played by verb type and the possible effect of the simultaneous acquisition of two languages (i.e. the so-called bilingual effect).

As discussed in section 2, interlinguistic influence may occur during the simultaneous acquisition of two languages (i.e. English and Chinese in this particular case). This influence can have three potential manifestations (Paradis and Genesee 1996): (i) acceleration, (ii) delay and (iii) transfer. Hypotheses have been formulated by taking into account the nature of interlinguistic influence, as presented above, in terms of the different manifestations of interlinguistic influence, as well as the different issues that can determine interlinguistic influence (i.e. maturational effects, input ambiguity and verb type).

Taking a look at Hulk and Müller's (2000) Interference Hypothesis and Hsin's (2012) Structure Transfer Hypothesis, the DO realization mechanism in Chinese and that in English satisfy the conditions for delay and transfer. Therefore, if there is interlinguistic influence from Chinese into English, Hypothesis #1 can be formulated as in (5).

(5) Hypothesis #1

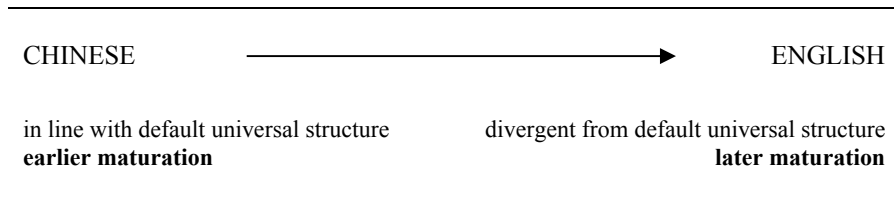
DELAY AND TRANSFER: OVERPRODUCTION OF NULL DOs IN C-E BILINGUALS (quantitative and qualitative differences between bilinguals and monolinguals)

| | | | | |
|---|---|---|---|---|
| CHINESE |  | ENGLISH |  | SPANISH |
| <p>Overt DOs (specific, individuated / non-specific, non-individuated)</p> | | <p>Overt DOs (specific, individuated / non-specific, non-individuated)</p> | | <p>Overt DOs (specific, individuated / non-specific, non-individuated)</p> |
| <p>Null DOs (specific, individuated / specific, non-individuated)</p> | | <p>Null DOs (non-specific, non-individuated)</p> | | <p>Null DOs (non-specific, non non-individuated)</p> |

According to this hypothesis, delay and transfer may occur in C-E bilinguals' English DO production. This means that the English of C-E bilingual children would contain more null DOs than the English of monolingual children, and that the null-object period of C-E bilinguals would be longer than that of monolinguals. Such delay and transfer would not be expected in S-E bilinguals' English production because of the similar DO realization mechanism in the two languages. Moreover, if the S-E bilinguals' English DO production is comparable to that of the E monolinguals and, therefore, different from that of C-E bilinguals', it could also eliminate the possibility of the so-called bilingual effect on the C-E bilinguals' DO production.

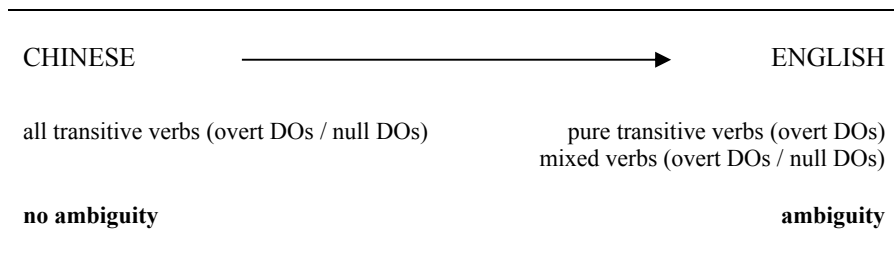
In order to identify the role played by factors such as maturational schedule in each language, input ambiguity and verb type that are considered to be related to interlinguistic influence and have also been used in previous works to determine the directionality of the influence (Ingham 1993; Paradis and Genesee 1996; Hulk and Müller 2000), the following three hypotheses are formulated.

(6) Hypothesis #2

INTERFERENCE AND MATURATIONAL SCHEDULES:
OVERPRODUCTION OF NULL DOs IN C-E BILINGUAL ENGLISH

What this hypothesis states is that interlinguistic influence would occur from Chinese into English in C-E bilinguals since Chinese is expected to mature earlier than English in the case of DOs and the allowance of null DOs. This assumption is made based on the account that Chinese null DOs are all-purpose, which is in line with children's initial default option, while English DOs are divergent from it; therefore, children do not have to experience the period of convergence in Chinese while they have to do so in English. As a result, the English of C-E bilinguals would contain more null DOs than that of E monolinguals. This directionality of influence would, consequently, lead to delay, as discussed above.

(7) Hypothesis #3

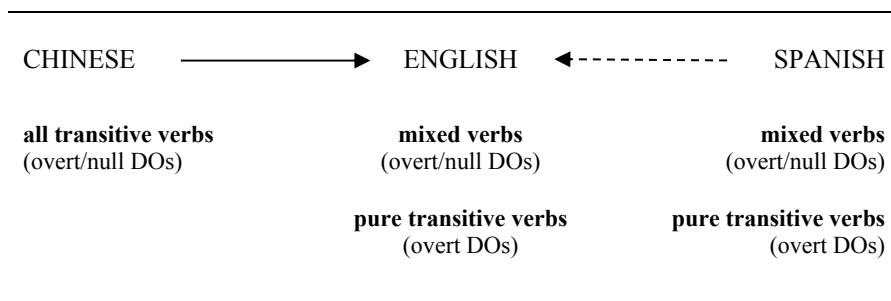
INTERFERENCE AND INPUT AMBIGUITY TRIGGERED BY THE
NATURE OF VERBS: OVERPRODUCTION OF NULL DOs IN C-E
BILINGUAL ENGLISH

All transitive verbs can take both overt and null DOs in Chinese. However, not all transitive verbs in English can take both overt and null DOs: pure transitive verbs can virtually only take overt DOs while mixed verbs in English can take both overt and null DOs. In other words, while all verbs behave the same in Chinese in the domain of DOs, not all verbs behave the same in English. As a result, while there is no ambiguity in Chinese DO realization, ambiguity occurs in English in this respect. Therefore, what this hypothesis states is that interference from Chinese into English may be reinforced in C-E bilinguals due to input ambiguity in English in that bilinguals will overextend the unambiguous system (i.e. that of Chinese).

Apart from the different maturational schedules of the two languages in bilinguals and input ambiguity, some previous studies on DO realization in child language have suggested that verb type (i.e. whether the transitive verb is pure transitive or mixed) may play a role in children’s null DO overproduction. Monolingual children overproduce null DOs, and in a higher proportion with mixed verbs than with pure transitive verbs. This has been linked to children being sensitive to the fact that some verbs (i.e. mixed verbs) can take null DOs (Ingham 1993). Therefore, Hypothesis #4 is formulated, as in (8).

(8) Hypothesis #4

INTERFERENCE AND VERB TYPE: MORE OVERPRODUCTION OF NULL DOs WITH MIXED VERBS THAN WITH PURE TRANSITIVE VERBS



What this hypothesis refers to is that mixed verbs would be more difficult to acquire since they do not always show the same pattern and are, therefore, less transparent than pure transitive verbs. This difference in terms of verb type in English would be seen across all groups of participants (bilinguals and monolinguals alike). However, a quantitative difference would appear between C-E bilinguals, on the one hand, and S-E bilinguals and English monolinguals, on the other, given the prominent nature of null DOs in Chinese: that is, C-E

bilinguals would produce more null DOs with mixed verbs in English compared to their S-E bilingual and English monolingual peers (as suggested in Hypothesis #1).

3.2 Participants and data selection

The data used in the present study are taken from different corpora in CHILDES (MacWhinney 2000). None of the participants in the corpora selected has been reported to have any hearing or language impairment. The target group is a set of five C-E bilingual children in Hong Kong (Yip-Matthews corpus). In order to test the hypotheses presented above, two more groups of participants have been selected: two S-E bilinguals in Salamanca, Spain (FerFuLice corpus), and three English monolinguals in the US (Sachs corpus; Bloom 70 corpus; Demetras Trevor corpus).

All the recordings of the ten participants presented above involved interactions between the children, the investigators and the family members, and were made in naturalistic settings, usually at home, and thus recorded spontaneous production data. The data of the ten participants are collapsed based on their L1(s). A summary of the collapsed data selection in each language group appears in Table 1.

| <i>L1(s)</i> | <i>Age range selected</i> | <i>MLU</i> | <i>No. of utterances</i> |
|--------------|---------------------------|------------|--------------------------|
| C-E | 2;00-3;00 | 1.6-4.0 | 17,630 |
| S-E | 2;05-3;04 | 1.5-4.1 | 7,646 |
| E | 1;10-2;11 | 1.9-4.2 | 32,432 |

Table 1. Summary of the Selected English Data

The data selection in Table 1 is based on the following two criteria so that, given the available data, comparisons across children and across languages could be done: (i) spontaneous data from a period of (approximately) one year are selected from each child in order to have enough data to reflect the child's development into the adult grammar; and (ii) given that there appears to be a turning point in development at the age of 2;03, when the child's MLU value reaches approximately 2.4 (Rispoli 1992), the selected age range is from 2;00 to 3;00 with small fluctuations and takes into account the individual child's MLU values. Additionally, since English is the language under analysis, only English data are analysed in the study in the case of the two sets of bilingual children.

3.3 Classification criteria: DO production

The investigation of DO realization in child language is carried out in environments where the adult grammar may accept or sanction the form of the DOs (i.e. overt or null) following the description of DOs in section 1. Therefore, all the transitive verbs (including simple verbs and phrasal verbs) produced by the participants in the accredited utterances are considered, regardless of their nature (i.e. overt or null) and of their adherence to the adult norm (i.e. adult-like or non-adult-like). The DOs produced by the children are then divided into four categories and codified accordingly: (i) adult-like overt DOs, (ii) adult-like null DOs, (iii) non-adult-like overt DOs, and (iv) non-adult-like null DOs.

In order to provide the most conservative analysis, some utterances are excluded from the count and, therefore, from the subsequent data analysis. These include the following: imitations of one of the previous five utterances of the interlocutor(s), partially unintelligible utterances, incomplete utterances, and routines such as counting, songs and nursery rhymes. In the case of immediate self-repetitions within a single utterance and self-repetitions of the same sentence over a sequence of utterances, only one occurrence is counted. In the case of self-repetition with self-correction within a single utterance, the instance counted is always the last one produced.

4. THE ANALYSIS OF ENGLISH DOs IN LANGUAGE ACQUISITION DATA

This section offers a detailed analysis of the data involved in the present study. It aims to explore the difference in the nature of English DOs among the production of the three groups of participants, namely, C-E bilinguals, E monolinguals and S-E bilinguals. The distribution of DOs in the English data in terms of the nature and the status of DOs are shown in Tables 2 and 3 for an overall and developmental view respectively, and in Table 4 for a more detailed account based on verb type. This division corresponds to a quantitative analysis and a qualitative analysis respectively.

4.1 Quantitative analysis

Table 2 reflects the distribution of DOs in the selected data in terms of their nature and their status (i.e. adult-like *versus* non-adult-like; overt *versus* null).

| <i>L1(s)</i> | <i>Total tokens</i> | <i>Overt</i> | <i>*Overt</i> | <i>*Overt%</i> | <i>Null</i> | <i>*Null</i> | <i>*Null%</i> |
|--------------|---------------------|--------------|---------------|----------------|-------------|--------------|---------------|
| C-E | 3,543 | 2,608 | 0 | 0 | 211 | 724 | 20.43 |
| S-E | 1,675 | 1,479 | 0 | 0 | 123 | 73 | 4.36 |
| E | 7,384 | 6,518 | 0 | 0 | 385 | 481 | 6.51 |

Table 2. Overall Distribution of DOs in the Target Children's English Data

The results of the present study, as in Table 2, show that all ten participants produced non-adult-like null DOs in their English output. This concurs with the results of various previous studies in different languages (monolingual French and monolingual English in Pérez-Leroux, Pirvulescu and Roberge (2008), bilingual French in Müller, Crysmann and Kaiser (1996) and Müller and Hulk (2001), monolingual Italian in Guasti (1993/1994) and Schaeffer (2000), monolingual Spanish in Fujino and Sano (2002), bilingual Chinese in Yip and Matthews (2005)). Consequently, it is reasonable to believe that all children, regardless of their L1(s), go through a null-object stage and that null DOs appear as a developmental feature of child language, a proposal that is in line with that of Pérez-Leroux, Pirvulescu and Roberge's (2008). What is more, no non-adult-like overt DO is found in any of the ten participants' data.

From Table 2 it can also be observed that the participants' performance is not equally indiscriminate: the results demonstrate an obvious distinction in the percentage of non-adult-like null DOs across the participants' English production. The rates of non-adult-like null DOs vary wildly depending on the participants and their L1(s): the average percentage of non-adult-like null DOs produced by the five C-E bilinguals is 20.43% during the one-year investigation period; that of the two S-E bilinguals is 4.36% and that of the three E monolinguals is 6.51%. These numbers indicate that the non-adult-like null DO rates of the C-E bilinguals are much higher than those of the five participants in the other two groups. What is more, the percentages of non-adult-like DOs produced by the S-E bilinguals are slightly lower than those of the E monolinguals. Such observation is supported by the results of a Welch Analysis of Variance (ANOVA) on the ten participants' individual average non-adult-like null DO rates based on their language groups: the three language groups are compared using an unequal variance *F*-test and found to be significantly different ($F(2, 4.353)=10.995, p=.020$) in terms of non-adult-like null DO production. Furthermore, the results of a Games-Howell post-hoc test show that there is a significant difference in non-adult-like null DO rates between the C-E bilingual participants and the S-E bilingual participants ($p=0.013$), as well as

between the C-E bilingual participants and the E monolingual participants ($p=0.017$). However, there is no significant difference between the performance of the S-E bilinguals and E monolinguals ($p=0.596$).

When looking at the developmental data, it is found that, at the beginning of the investigation period when the participants' MLU values are lower than 2.4, the participants in the three language groups produce non-adult-like null DOs with high frequency, as shown in Table 3.

| <i>L1(s)</i> | <i>Stage I</i> (<i>MLU < 2.4</i>) | | <i>Stage II</i> (<i>2.4 ≤ MLU ≤ 3.5</i>) | | <i>Stage III</i> (<i>MLU > 3.5</i>) | |
|--------------|---|---------------|---|---------------|---|---------------|
| | <i>Total tokens</i> | <i>*Null%</i> | <i>Total tokens</i> | <i>*Null%</i> | <i>Total tokens</i> | <i>*Null%</i> |
| C-E | 341 | 21.41 | 2,776 | 21.15 | 426 | 15.02 |
| S-E | 258 | 12.02 | 211 | 2.84 | 1,206 | 2.99 |
| E | 484 | 30.99 | 2,402 | 8.74 | 4,498 | 2.69 |

Table 3. Developmental Distribution of Non-adult-like Null DOs in the Target Children's English Data

However, the developmental patterns of the participants in the different language groups are different: on the one hand, the S-E bilingual and E monolingual participants' data witness an acute drop in the average percentages of non-adult-like null DOs as their MLU value increases; on the other hand, in the C-E bilinguals' data, no obvious decrease is found. At the final stage of the investigation period, the non-adult-like null DO rate produced by the C-E bilinguals is reduced but maintains higher than those produced by the participants in the other two language groups.

These results further confirm Rispoli's (1992) proposal that, before their MLU values reach 2.4, children are not able to relate DO realization with discourse context. Since this applies to all children regardless of their L1(s), no statistically significant difference is found among the participants in the three language groups at the beginning of the investigation period and the C-E bilinguals' non-adult-like null DO rate is comparable to that of the S-E bilinguals ($p=.342$) and to that of the E monolinguals ($p=.205$). At the next stage, the C-E bilinguals produce significantly higher non-adult-like null DO rates than the S-E bilinguals and E monolinguals (S-E $p=.016$, E $p=.040$). This may be the consequence of the negative influence from Chinese on the C-E bilinguals' English production since this is the main distinction between the C-E bilinguals and the participants in the other two language groups. Such influence

may delay the C-E bilingual children's English development in this particular area of grammar. At the final stage, as the bilinguals' MLU values in English increase, the interlinguistic influence from Chinese reduces and the difference between the C-E bilinguals and the participants in the other two language groups becomes statistically non-significant (S-E $p=.062$, E $p=.063$). What is more, the S-E bilinguals' performance is comparable to that of the E monolinguals throughout the one-year investigation period. This suggests that the C-E bilinguals' less-adult-like performance is not the result of the so-called bilingual effect but of the influence from Chinese into English. Therefore, Hypothesis #1 regarding delay due to language interference in bilingual acquisition is confirmed, viewing the data both overall and longitudinally.

The reason for such a negative influence from Chinese into English may be the result of different maturational schedules in the acquisition of DOs in the two languages. It has been discussed previously that all children go through a null-object stage regardless of whether the target language allows them or not because all children start out with an all-purpose null object N (Pérez-Leroux, Pirvulescu and Roberge 2008). In Chinese, the DO realization mechanism is in line with children's initial default option, while the one in English is divergent from it; therefore, children do not have to experience the period of convergence in Chinese while they have to do so in English. Consequently, monolingual Chinese children are expected to reach adult-like performance at an earlier age in the domain of DOs when compared to their E monolingual counterparts; and this should be so in C-E bilinguals' language production in both languages. In other words, C-E bilinguals' early Chinese production should be more adult-like than their early English production in the parallel period, which satisfies the condition proposed by Paradis and Genesee (1996) for language interference. Such interference will continue to occur until the C-E bilinguals become mature in their English DO performance.

The results of the statistical analysis, as indicated above, have provided evidence for such interference. It is found that the C-E bilinguals produce non-adult-like null DOs with a statistically significant, higher frequency when compared to the E monolinguals and S-E bilinguals at Stage II of the investigation period. This indicates a delay in the C-E bilinguals' English DO production. That is, the English DO realization mechanism in the C-E bilinguals matures later than that of their S-E bilingual and E monolingual counterparts (when their MLU values reach 2.4) likely due to the influence from Chinese into English. Therefore, Hypothesis #2 regarding the relationship between language interference and the maturation schedule of the two languages in bilingual children is also confirmed. It has also been demonstrated that the so-called bilingual effect is not responsible for the C-E bilinguals' higher non-adult-like null DO rates since the S-E bilinguals' performance in this grammatical domain is comparable to that of the E monolinguals.

4.2 Qualitative analysis

Apart from the identified quantitative differences that have been addressed above, qualitative differences are also observed in the results of the data analyses and will be explored next.

Table 4 presents an overall view of the non-adult-like null DO rates of pure transitive verbs and mixed verbs produced by the ten participants.

| <i>L1(s)</i> | <i>Tokens</i> | <i>*Pure%</i> | <i>Tokens</i> | <i>*Mixed%</i> |
|--------------|---------------|---------------|---------------|----------------|
| C-E | 426 / 2,210 | 19.28 | 298 / 1,333 | 22.36 |
| S-E | 36 / 1,026 | 3.51 | 37 / 649 | 5.70 |
| E | 382 / 5,161 | 7.40 | 99 / 2,251 | 4.40 |
| TOTAL | 844 / 8,397 | 10.05 | 434 / 4,233 | 10.25 |

Table 4. Overall Non-adult-like Null DO Rates Produced by the Participants

From Table 4 it can be noted that overall the non-adult-like null DO rates of the pure transitive verbs and of the mixed verbs are very similar, as indicated in the total row (10.05% and 10.25% respectively). In the C-E as well as in the S-E bilinguals' data, the non-adult-like null DO rates are slightly higher with mixed verbs than with pure transitive verbs, but the reverse pattern is found in the E monolinguals' data. This lack of consistency suggests that verb type does not surface as a factor that affects children's DO realization. What can be concluded from here is that the differences in performance across the different language groups (Tables 2 and 3) are not translated into a different behaviour between the two verb types.

The results also provide positive evidence for Hypothesis #3 regarding the relation between language interference and input ambiguity. That is, since all verbs behave the same in Chinese in the domain of DO (i.e. all transitive verbs behave like mixed verbs) and not all transitive verbs behave the same in English (i.e. pure transitive verbs *versus* mixed verbs), the ambiguity caused by the two types of verbs in English would trigger interference from Chinese, which provides no ambiguity in terms of DO realization. As a result, interference from Chinese into English may be reinforced in C-E bilinguals due to input ambiguity in English, causing bilinguals to overextend the unambiguous system (i.e. that of Chinese) onto the ambiguous system (i.e. that of English).

What is more, the results above do not support Hypothesis #4 regarding the relation between language interference and verb type: the children in these three language groups do not produce statistically more non-adult-like null DOs with mixed verbs than with pure transitive verbs ($p=.804$). In other words, the participants in the present study behave differently from the ones in Ingham's (1993) study, as they do not avoid producing transitive structures that they cannot trace in the input.

Further classification of the ten participants' data has been undertaken in order to allow us to carry out a more detailed qualitative analyses of the data and topic under investigation. The classification of the data in this case has been done 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.

In the results of this further classification, in the C-E bilinguals' data, among the verbs that take non-adult-like null DOs most frequently, the verb *put* stands out as having a fairly high non-adult-like null DO rate (from 42% to 63%), whereas other verbs tend to vary significantly in their frequency in this respect (e.g. *get* 2.94%-32.82%, *like* 4.48%-15.91%). The non-adult-like usage of the verb *put* produced by these four C-E bilingual children is illustrated in (9).

- (9) *Put *e* here (Timmy 2;04)
(Yip-Matthews corpus, CHILDES)

The sentential pattern of example (9), whereby the verb *put* is directly followed by a locative as an obligatory complement, is very similar to the structure found in Chinese, as shown in (10):

- (10) Baai2 (hai2) *e* li1dou6. (Yip and Matthews 2005: 2426)
 put here
 "Put Ø (it) here."

Such null-object structures are very common in Chinese and can be found abundantly in the C-E bilinguals' Chinese production within a parallel time frame (i.e. between 2;00 and 3;00).

In the case of the two S-E bilinguals and the three E monolinguals, there is not a particular verb whose percentage of non-adult-like null DOs stands out in the data, as all the verbs vary in their frequency of taking non-adult-like null DOs. This lack of consistency suggests that the usage of transitive verbs with regards to DO realization in Spanish, which is very similar to that of English, may not have a significant influence on the S-E bilingual participants' English

production and, therefore, the S-E bilinguals perform similarly to the E monolinguals in this respect.

What could be inferred from this is that the Chinese null DO pattern has a considerable impact on the C-E bilinguals' English output also from the point of view of the specific lexicon used. This assumption could be further supported by the fact that the common and adult-like structures of the verb *put* in Chinese find their equivalent structures in the target C-E bilingual children's English in which they become non-adult-like according to the standard grammar of the English language, which makes the non-adult-like null DO rates of this verb stand out. At the same time, in the C-E bilingual participants' Chinese production during a parallel period, these structures are found to be abundant. On the contrary, similar results are found in the S-E bilinguals' and in the E monolingual participants' data. That is, no verb distinguishes itself by taking non-adult-like null DOs with high frequency. This finding also supports Hypothesis #1 regarding language transfer in bilingual acquisition. That is, the C-E bilinguals produce non-adult-like null DOs qualitatively different when compared to their S-E bilingual and E monolingual counterparts.

5. CONCLUSIONS

In this study English DOs produced by C-E bilinguals are compared to those produced by S-E bilinguals and E monolinguals. In both quantitative and qualitative analyses the C-E bilinguals are found to produce non-adult-like null DOs more frequently and until later on when compared to the S-E bilinguals and E monolinguals. Moreover, the C-E bilinguals also produce non-adult-like null DO structures in English based on the Chinese grammar. It is also confirmed that the difference between the C-E bilinguals' performance and that of the E monolinguals is not the result of the so-called bilingual effect since the S-E bilinguals' performance is found to be comparable to that of the E monolinguals. Therefore, it is very likely that, in the C-E bilinguals' language acquisition process, the null DO mechanism in the Chinese language serves as the basis for object specification in English; that is, that there is interlinguistic influence from Chinese into English in this respect.

The level of interlinguistic influence is not decided by a single factor, but is rather the result of several intervening factors. In this study, maturational effect and input ambiguity are found to play important roles. However, verb type does not appear to be a determinant factor.

Further work on the topic could look into the Chinese data, the other L1, so that issues regarding for example the directionality of interlinguistic influence (i.e. whether there is interlinguistic influence from English into Chinese in C-E

bilinguals) could be investigated. Additionally, an analysis of the data in terms of language dominance as well as each participant's individual pattern could yield a more refined analysis.

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