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Crosslinguistic influence and language dominance in older bilingual children*

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The point of departure of this study is the well-known hypothesis according to which structures that involve the syntax–pragmatics interface and instantiate a surface overlap between two languages are more vulnerable to crosslinguistic influence than purely syntactic domains (e.g. Müller and Hulk, 2001). In exploring the validity of this hypothesis for later stages of bilingual acquisition, the study aims to establish whether crosslinguistic influence occu only in one direction, i.e. from English to Greek, which structural factors can account for the directionality of crosslinguistic effects, and whether language dominance plays a role in determining the occurrence and the strength of these effects in older bilingual children. Experimental data are presented from 32 English–Greek eight-year-old simultaneous bilinguals – 16 Greek-dominant living in Greece and 16 English-dominant living in the UK – and monolingual control groups. A number of syntax–pragmatics interface and narrow syntax structures were investigated and the results showed that both types of structures were found to be selectively vulnerable to crosslinguistic influence in the predicted direction, but only in the grammar of the English-dominant bilinguals.

Crosslinguistic influence in bilingual first language acquisition

Language differentiation has been one of the main foci of research on bilingual acquisition. A wide literature addresses the issue of whether children who acquire two languages from birth begin with one language system or two separate linguistic systems (e.g. Genesee, 1989; Meisel, 1989; De Houwer, 1990). Many studies have reported the absence of interaction between the bilingual children's developing languages, suggesting that the two grammars develop separately and autonomously (De Houwer, 1990; Paradis and Genesee, 1996, among others).

However, recent studies in child bilingualism have reported the existence of crosslinguistic influence from one language to another, but subject to restrictions of directionality and/or grammatical domain (e.g. Döpke, 1998; Müller, 1998; Yip and Matthews, 2000; Müller and Hulk, 2001, among others). The focus of more recent research has correspondingly shifted to more refined questions about the conditions allowing the interaction between the two linguistic systems of bilingual children.

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One influential hypothesis indicates that the most likely locus of crosslinguistic influence is the C(omplementiser)-domain, which is responsible for the anchoring of syntax to discourse pragmatics or, in more general terms, for the syntax–discourse interface (e.g. Hulk and Müller, 2000; Müller and Hulk, 2001).[1] The C-domain has been found to cause problems in several domains of language development (see Avrutin, 1999; Platzack, 2001; Tsimpli et al., 2004).

According to this hypothesis, two conditions are necessary for crosslinguistic influence to occur: a) the structure under consideration should be relevant to the

[1] According to current definitions (e.g. Platzack, 1999; Tsimpli et al., 2004), the syntax–discourse interface is the interpretative component of natural language grammar usually associated with the LF level of syntactic representation: semantic and discourse-related features which are represented in the syntactic structure become available for further processing in central cognition in this domain. In contrast, "narrow" or "core" syntax is regarded as the computational system that operates exclusively on syntactic symbols (Avrutin, 1999; Burkhardt, 2005). In a more general sense, a structure is considered to involve the syntax–discourse interface when it requires the integration of both syntactic and discourse pragmatic knowledge. The syntax–discourse interface is less well understood than other types of interfaces, such as the syntax–semantics and the syntax–phonology interfaces; but see recent works by Avrutin (2004) and Burkhardt (2005), that combine theoretical perspectives and experimental evidence on processing; see also Tsimpli and Sorace (2006), who suggest there may be developmental differences between the syntax–discourse interface, where effects are manifested in terms of preferences of contextual appropriateness, and other types of interface that have clear grammaticality effects.

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syntax–pragmatics interface, the most likely locus for crosslinguistic effects; b) there needs to be an overlap at the surface level between the two languages for this particular structure. This means that if language A allows for more than one possible grammatical analysis of a syntactic structure, and if the input from language B reinforces one of these grammatical analyses, then crosslinguistic influence is expected from language B to language A, provided that the interface between syntax and pragmatics is involved.

Müller and Hulk (2001) investigated the rate of object omission in German, Dutch, French and Italian monolingual children, and in three young German–French (1;5–5;10), Dutch–French (2;3–3;10) and German–Italian (1;8–6) bilingual children. In Dutch and German (languages B) object drop is allowed in clause-initial position only, when the object has the pragmatic function of topic. Thus, the choice between null or overt objects is regulated by discourse pragmatics. In French/Italian (language A), however, null objects are not allowed regardless of their topic status, but when pronominal object clitics are used they appear preverbally, as shown in the following examples:

(1) Jean le_i voit ec_i.
"John sees him."
(2) Anna lo_i vede ec_i.
"Anna sees it."

The canonical postverbal object position is left empty, and thus this is an ambiguous piece of evidence for the bilinguals, suggesting that object drop is allowed in French and Italian. In other words, there is a surface overlap between language A (French/Italian) and language B (Germanic).[2]

The bilingual children in Müller and Hulk's study were indeed found to omit objects in Italian and French at a higher rate than the monolingual children in each language. The authors suggest that these object omission errors are due to crosslinguistic influence from the Germanic to the Romance languages, and that the topic drop input from the Germanic languages underlie the bilinguals' higher rates of object omission errors in French and Italian.

Crucially, this type of crosslinguistic influence, which is argued to take place before the instantiation of the C-domain, results in syntactically ungrammatical object omission errors. These omission errors, however, are pragmatically acceptable since the null objects in French and Italian refer to salient entities in the previous discourse and thus their content can be easily recovered (Allen, 2001; Paradis and Navarro, 2003; Serratrice, 2005).

Thus, although Müller and Hulk (2001) highlighted the crucial role of pragmatics in determining syntactic choice, they did not analyse the pragmatics of object drop in depth. In addition, even though they propose that crosslinguistic influence is likely to take place at the syntax–pragmatics interface, they tested only one part of the proposal since they analysed the frequency of object omission errors without systematically investigating the pragmatic context in which those errors occur.[3] As Allen (2001) suggests, in order to build a convincing account of crosslinguistic influence at the syntax–pragmatics interface it is essential to investigate both the structural outcomes and the discourse-pragmatic factors that determine argument realisation.[4]

Addressing this particular shortcoming of Müller and Hulk's (2001) study, recent studies in simultaneous bilingual acquisition have investigated other syntactic options that are governed by discourse-pragmatic constraints, and thus involve the interface between syntax and pragmatics, such as the distribution of null and overt subject pronouns in English–Spanish and English–Italian bilinguals (Paradis and Navarro, 2003; Serratrice, Sorace and Paoli, 2004; Serratrice, 2005). These studies examine both the frequency of null and overt subjects, as well as the discourse-pragmatic contexts in which the null and overt

[2] Unsworth (2003) notes that Hulk and Müller's (2000) proposal is not entirely clear on the meaning of "overlap" (see also Müller and Hulk, 2001). The authors state that "there has to be a certain overlap of the two systems at the surface level" (2000: 228). It turns out that what this means is that there should be overlap between surface forms in the input of the two languages (Unsworth, 2003). Provided that the two languages overlap in the relevant domain, the main assumption is that bilingual children can somehow equate these overlapping forms. A more general implication (generally not made explicit in the literature) is that bilingual children, at least with respect to syntax–pragmatics interface phenomena, rely on surface input rather than on abstract grammatical properties. Unsworth also suggests that Müller and Hulk are referring to partial overlap, since one of the conditions on crosslinguistic influence implies that the two languages should not behave identically with regard to a specific domain, i.e. one language provides evidence for two different analyses and the other language provides evidence for just one of these analyses. According to this idea, therefore, the child is presented with competing evidence for what the underlying representation should be for the overlapping structure because the surface forms from the child's two languages could provide ample positive evidence for the grammatical system the child is converging on in one language (see Paradis and Navarro, 2003).

[3] There is a more fundamental problem, as pointed out by a reviewer, with the lack of definition of the construct "interface" and with the consequent difficulty in finding data that could unambiguously support or reject Müller and Hulk's hypothesis. More research is certainly needed to address the nature of interfaces and the potential differences among types of interface (see Tsimpli and Sorace, 2006 for a brief discussion of these issues).

[4] There is a substantial body of developmental literature on the effect of discourse pragmatics on argument realisation, e.g. Allen (2000; 2001); Serratrice and Sorace (2003). Most of this literature, however, (with the significant exception of Serratrice and Sorace's study) is open to the same type of criticism, i.e. that it focuses on effects of pragmatics without trying to account for its interaction with structural factors.

forms appear in order to pinpoint exactly which discourse-pragmatic factors affect crosslinguistic influence.

As these authors point out, the distribution of null and overt subject pronouns is suitable for the evaluation of the crosslinguistic influence hypothesis since: a) it involves the syntax-discourse interface, i.e. the complementary distribution of null and overt subject pronouns is constrained by discourse-pragmatic factors, and b) there is a partial overlap at the surface level between the two languages, in the sense that Spanish and Italian allow for both null and overt subjects, whereas English provides extensive positive evidence only for the overt subject option.

Serratrice et al.'s (2004) study of null and overt subject pronouns in English–Italian bilingual acquisition suggests an extension of the crosslinguistic influence hypothesis advocated by Müller and Hulk (2001). These authors propose that after the C-domain is in place a different form of crosslinguistic influence is still possible. At that stage, however, the outcome of crosslinguistic influence could not be syntactically target-deviant omission errors – the type of errors that, according to Müller and Hulk, occurs at earlier stages before the C-domain is instantiated. Older bilinguals, in fact, are aware of the syntactic constraints on null argument in their language(s): for instance, they will know whether their language allows null subjects, like Italian, or not, like English; whether null objects are allowed, and if so in what position (e.g. clause-initially in German). In this later developmental phase, the outcome of crosslinguistic influence is therefore likely to be pragmatically inappropriate commission errors.

Serratrice et al.'s prediction was that English–Italian bilingual children may be prone to crosslinguistic influence in language A (Italian), because in this language they deal with a choice between two options which are constrained by discourse-pragmatics, e.g. null and overt subject pronouns, and one of these two options, overt subject pronouns, is supported by language B (English). The option on which the two languages overlap is thus likely to become more widely used in language A, appearing in infelicitous discourse contexts.

This is indeed what these authors found in the case of an English–Italian bilingual child (3–4;6). The bilingual child was found to overgeneralise – more frequently than Italian monolingual children – the use of third person overt subject pronouns in contexts in which null subjects were required, as illustrated in (3).

(3) The researcher (R) is talking with the child (C) about a cartoon character:

R: no ma **Rosarospa** e cattiva o buona?
no but Rosarospa is bad or good

C: um be proprio simpatica.
um well really nice

R: simpatica?
nice

C: si proprio simpatico perche **lei** e solo
yes really nice because she is only
travestita da strega.
dressed up as a witch

The bilingual child inappropriately used the third-person overt pronominal subject *lei* as co-referential with the topic antecedent mentioned in the immediately preceding discourse. In this context however, a null subject co-referential with the prominent subject antecedent is the pragmatically appropriate choice in Italian (Serratrice at al., 2004).

Similar findings were reported by Paradis and Navarro (2003) who investigated whether crosslinguistic influence occurs in the domain of subject realisation in Spanish in an English–Spanish bilingual child (1;9–2;6). This bilingual child was found to produce significantly more overt subjects in Spanish than the age-matched Spanish monolinguals, and she also used inappropriate overt subject pronouns in contexts in which their use was not pragmatically felicitous. In this case, however, the child's Spanish input included a higher number of overt subject pronouns than for her Spanish monolingual peers, and hence the possibility that the child was simply mirroring the parental input cannot be excluded.

Serratrice (2005) investigated the possibility of crosslinguistic influence in a group of 8-year-old English–Italian bilingual children, on the assumption that, even with sustained and regular exposure to two languages, crosslinguistic influence in the choice of pragmatically appropriate forms may persist over time. An off-line experiment on the anaphoric interpretation of null and overt subject pronouns showed that these older English–Italian bilinguals inappropriately accepted overt pronominal subjects as co-referential with a subject antecedent significantly more frequently than the Italian monolingual children and adults. As shown in the example (4), the overt pronominal subject *lei* can only be coreferential with the object of the main clause, but not with the subject antecedent *Laura*.

(4) Laura_i ha salutato Paola_j quando
Laura have-3SG greeted Paola when
$\text{lei}_{*i/j}$ è uscita.
she-NOM is-3 SG gone out
"Laura greeted Paola when she went out."

In English, in contrast, the subject pronoun *she* can be coreferential either with the subject or the object of the main clause, as exemplified in (5).

(5) Laura_i greeted Paola_j when $\text{she}_{j/i}$ went out.

All the previous studies suggest that the overgeneralisation of overt subject pronouns in pragmatically infelicitous

contexts is due to crosslinguistic influence from English to Italian and Spanish in both younger and older bilinguals. As a result, structures that involve the syntax–pragmatics interface and instantiate a surface overlap between the two languages may still be vulnerable to crosslinguistic influence even in grammars of 8-year-old bilinguals, and therefore well after the C-domain is in place. At these later developmental stages, however, crosslinguistic influence results in pragmatically infelicitous errors and not in syntactically ungrammatical omission errors.

The study

Differently from previous studies of crosslinguistic influence that have typically considered very young bilinguals (e.g. Müller and Hulk, 2001; Paradis and Navarro, 2003), the aim of the current study is to investigate whether crosslinguistic influence occurs in 8-year-old English–Greek bilinguals, and whether some areas of grammar continue to be more vulnerable to crosslinguistic influence than others at a stage when the C-domain has been instantiated and children should have full knowledge of the syntactic constraints of their languages. In particular, the question addressed is whether, given prolonged and regular exposure to two languages, morphosyntactic options that are constrained by discourse pragmatics and instantiate a partial overlap between the two languages may still be susceptible to crosslinguistic influence even in older bilinguals.

Since the vast majority of the studies investigating crosslinguistic influence have been in-depth longitudinal studies of only a few children, it is difficult to generalise without complementing this research with studies of larger samples (see also Serratrice, 2005). Differently from most previous studies, this study's subject pool consists of 32 English–Greek bilinguals.

Furthermore, the vast majority of the studies that have considered the issue of crosslinguistic influence in several bilingual contexts have looked at spontaneous production data. Spontaneous data can be very informative but the researcher cannot control the contexts in which a particular linguistic form will appear. In the present study, elicited production and acceptability judgement tasks were used in order to obtain a more comprehensive and controlled picture of the children's linguistic competence.

In order to test the claim regarding the particular vulnerability of syntax–pragmatics interface structures to crosslinguistic influence in bilingual acquisition it is essential to also explore structures that are not relevant to the syntax–pragmatics interface (Allen, 2001; Unsworth, 2003). Previous studies that addressed the issue of crosslinguistic influence explored only syntax–pragmatics interface structures; in contrast, this study investigates narrow syntax structures as well in order to see the extent to which the syntax–pragmatics interface structures are more vulnerable to crosslinguistic influence than narrow syntax structures in older bilingual children.

Moreover, differently from the previous studies that explored crosslinguistic influence, this study tests two structures relevant to each domain, the syntax–pragmatics interface and narrow syntax respectively, in order to investigate whether different structures in each grammatical domain are equally prone to crosslinguistic influence. Specifically, the study explores whether the distribution of subjects, i.e. null and overt subject pronouns, preverbal and postverbal subjects, can be more susceptible to crosslinguistic influence from English to Greek than narrow syntax structures, i.e. the use of *what*-embedded interrogatives with a subject and object pronouns in declaratives.

The choice of subject pronouns and the placement of subjects in Greek might be prone to crosslinguistic influence from English since they involve the interaction of syntax and discourse conditions (e.g. Tsimpli et al., 2004; Tsimpli and Sorace, 2006). Furthermore, there is a surface overlap between Greek and English: both languages allow overt subjects but Greek also licenses null subjects; both languages instantiate preverbal subjects but only Greek allows postverbal subjects.

Another issue that is investigated in this study, but which has not been properly addressed in the recent literature on crosslinguistic influence, is whether language dominance, in the sense of the amount of input the bilinguals receive in each language, plays a role in crosslinguistic influence. There is no consensus among the researchers in bilingual acquisition regarding the conditions under which crosslinguistic influence takes place and what the direction of such an influence would be. Some researchers claim that crosslinguistic influence is due exclusively to language internal factors, on the assumption that external factors such as language dominance cannot determine crosslinguistic effects (Müller and Hulk, 2001). The findings of Müller and Hulk (2001) and Serratrice et al. (2004) are in line with this assumption, since the direction of crosslinguistic influence in their bilingual data was from the less dominant language to the dominant one.

Other studies, however, have shown that language dominance is an important factor that may affect the direction of crosslinguistic influence; these studies have reported incorporation of elements from the dominant language to the less dominant language in different grammatical domains (e.g. Leopold, 1949; Schlyter, 1993; Lanza, 1997). The present study aims to explore the role of language dominance in crosslinguistic influence in older bilinguals: in order to investigate this matter, two groups of Greek-dominant and English-dominant bilingual children were tested.

To sum up, the aims of the study are: a) to explore whether crosslinguistic influence occurs from English

to Greek in the grammar of 8-year-old English–Greek bilingual children; b) to establish whether the syntax–pragmatics interface structures are more susceptible to crosslinguistic influence than narrow syntax structures; and c) to investigate whether language dominance plays a role in crosslinguistic influence.

The syntax–pragmatics interface constructions that were investigated are: 1) the distribution of null vs. overt subject pronouns in [−topic shift] contexts; and 2) the distribution of preverbal vs. postverbal subjects in wide-focus contexts, and the purely syntactic constructions that were examined are: i) the use of preverbal vs. postverbal subjects in *what*-embedded interrogatives; ii) the placement of object pronouns in declaratives, that is, the placement of object clitics in Greek and the placement of strong object pronouns in English.

Language dominance in bilingual acquisition

It has often been noted in the bilingual acquisition literature that one language usually dominates the other even in cases of simultaneous acquisition of two languages from birth (e.g. Grosjean, 1982; Döpke, 1992). At the same time there has been discussion of the factors that might affect the occurrence of language dominance. In this respect, several researchers have highlighted the importance of the conditions of exposure as a causal factor of language dominance in bilingual children.

Grosjean (1982, p. 189) stated that "the main reason for dominance in one language is that the child has had greater exposure to it and needs it more to communicate with people in the immediate environment". Moreover, other researchers have noted that the level and active use of one of a bilingual child's languages is influenced by the amount of input the bilinguals receive in the language under consideration, that is, the proficiency level and active use of one of the bilingual's languages increases as a consequence of the increased input in that particular language (Döpke, 1992; De Houwer, 1995).[5]

Schlyter (1993) also suggested that the dominant language normally is the majority language, while the weaker language is usually the minority language. Similarly, Döpke (1992) claimed that in bilingual acquisition the language which is used more often in a wide variety of contexts (usually the majority language) in the bilingual's life tends to become more dominant over the language that is used less often in less significant contexts (usually the minority language). Klausen, Subritzky and Hayashi (1993) have considered the language of greatest exposure as evidence of a dominant language.

As is apparent from the previous discussion, the bilingual children's amount of exposure to each of their two languages can be used as an indicator of language dominance. For the purposes of this study, therefore, dominance is taken in the sense of the language to which the bilingual child is predominantly exposed in the majority of social situations, i.e. the language in which the bilingual child obtains more input on a regular basis.[6]

Grammatical structures investigated

Null and overt pronominal subjects

Greek has been extensively argued to be a null-subject language like Italian or Spanish because it permits finite sentences with unexpressed subjects (e.g. Tsiplakou, 1998; Tsimpli et al., 2004; Tsimpli, 2005). Conversely, English is characterised as a non-null-subject language since it requires the subject in finite sentences to be overtly realised.[7]

The null-subject parameter[8] has been proposed to account for the contrast between null-subject languages such as Greek and Italian and non-null-subject languages such as English (Chomsky, 1981; Rizzi, 1982, among others). In null-subject languages like Greek, the presence of rich verbal morphology, in which number and person agreement features are overtly realised, makes possible the identification of null subjects; non-null-subject languages like English have an impoverished inflectional paradigm, and the poor differentiation with regard to person and number inflections makes it impossible to identify null subjects. For the purposes of this paper, it will suffice to say that whether a language allows null subjects or not depends on a language-specific syntactic setting, i.e. in Greek/Italian/Spanish the null-subject parameter is set

[5] However, the quantity of input may not be the only variable that determines "dominance". Qualitative factors, such as whether one of the languages spoken to the child is a second language or is undergoing attrition, may play a role. These qualitative factors were not systematically investigated in this study (see Sorace, 2005 for further discussion).

[6] In the general bilingualism literature the term "dominance" has most often been defined in terms of another concept, i.e. "proficiency" that can be independently assessed (De Houwer, 1998; Romaine, 1995). The notion of "proficiency", however, and its assessment in bilingual acquisition has been questioned on conceptual and methodological grounds (Grosjean, 1989; Romaine, 1995; De Houwer, 1998; Edwards, 2004). In this study "proficiency" was not used or directly measured as an indicator of language dominance.

[7] Although English is not a null-subject language, null subjects are allowed in restricted registers but these are not the norm, e.g. in diary style coordinate clauses. However, null subjects are not allowed in subordinate clauses in English, unlike in Greek, a true null-subject language.

[8] The null-subject parameter is currently being redefined in theoretical syntax work (see Holmberg, 2005). In this paper, however, the traditional version of the parameter is assumed, in line with much of the developmental literature.

positively [+null subject], whereas in English the null-subject parameter is set negatively [−null subject].

Recent work has demonstrated that null and overt pronominal subjects in null-subject languages are not in free variation but there are in fact discourse-pragmatic principles that regulate their distribution (Enç, 1986; Dimitriadis, 1996; Grimshaw and Samek-Lodovici, 1998; Tsimpli et al. 2004, among others). The main assumption is that the distribution of null and overt subject pronouns is determined by the discourse status of the referent. A null subject is preferred when it is co-referential with a prominent topic antecedent, whereas an overt subject pronoun is used to refer to a new or non-prominent antecedent. For instance, a felicitous answer to the question in (6) requires the use of a null subject, as in (6a), and not an overt pronominal subject, as in (6b), which cannot co-refer with the subject antecedent.

(6) a. Jati pije sto vivliopolio i Eleni$_j$?
"Why did Eleni$_j$ go to the bookshop?"
b. Epidi *pro*$_j$ ithele na agorasi
because wanted-3SG to buy-3SG
ena vivlio.
a book-ACC
"Because *(she) wanted to buy a book."
c. @Epidi afti$_j$ ithele na agorasi
because she-NOM wanted-3SG to buy-3SG
ena vivlio.
a book-ACC
"Because she$_j$ wanted to buy a book."

In Greek, overt pronominal subjects are used in specific discourse-pragmatic contexts and their use is a marked option that signals topic shift (Tsimpli et. al., 2004) (see also Serratrice et al., 2004 and Serratrice, 2005 for Italian). In English, on the other hand, overt subject pronouns in English are not obligatorily associated with topic shift and thus, they can occur both with [+/−topic shift] referents (Tsimpli et al., 2004; Serratrice, 2005). Therefore, in this context the overt pronominal subject *she* is obligatory in English and it can co-refer freely with the topic antecedent (subject).

Preverbal and postverbal subjects

One common assumption in the syntactic literature for the last twenty years has been that the availability of null subjects in null-subject languages like Greek and Italian tends to co-occur with the availability of postverbal subjects in declarative sentences (Chomsky, 1981; Rizzi, 1982). The availability of phonetically null pronominal subjects in the preverbal subject position of the clause is considered to be the necessary condition for the availability of constructions with a postverbal subject in null-subject languages like Greek or Italian,[9] whereas this option is not available to non-null-subject languages like English (Rizzi, 1982). Thus, in Greek the overt subject of a declarative clause can freely occupy the postverbal position, whereas this is disallowed in English.[10]

The discourse function of focalisation interacts with word order in Greek, and thus focussed material can appear either in preverbal position or in postverbal position (in situ) (Tsimpli, 1995; Alexopoulou, 1999; Alexiadou and Anagnostopoulou, 2000). Preverbal foci are not considered to be equivalent to postverbal ones, since there are subtle interpretative differences between the two options.

In particular, preverbal focus is typically associated with narrow contrastive focus readings as shown in (7), an example of subject contrastive focus (Tsimpli, 1995; Tsiplakou, 1998; Alexopoulou, 1999; Alexiadou and Anagnostopoulou, 2000). The focused subject is accented, similar to English, and it appears in preverbal position in the leftmost part of the sentence (capital letters indicate the lexical item that bears the main prosodic prominence of the sentence):

(7) Q: Pios tilefonise, o Janis i o Kostas?
"Who phoned, Janis or Kostas?"
A: [$_F$ o JANIS] tilefonise.
[$_F$ the Janis-NOM] phoned-3SG
"Janis phoned."

In contrast, postverbal focus can be associated with non-contrastive wide-focus contexts (Alexopoulou, 1999).[11] An example of wide verb-subject focus is presented in (8), where the subject is pragmatically appropriate to appear in a postverbal position.

(8) a. Ti ejine to molivi tis Marias?
"What happened to Maria's pencil?"
b. [$_F$ to pire o PETROS].
[$_F$ it-CL took-3SG the Petros-NOM]
"Petros took it."

English, in contrast, resorts primarily to phonological means to mark the information status of elements within a sentence (Schmerling, 1976; Ladd, 1980, 1996;

[9] However, recent research on near-native L2 speakers of Italian has shown a dissociation between the availability of postverbal subjects and the availability of null subjects: postverbal subjects were produced significantly less often than null subjects (see Belletti, Bennati and Sorace, 2005). These findings suggest that the availability of null subject *pro* is a necessary, but not a sufficient condition to license postverbal subjects.

[10] Inverted subject constructions are also possible in English, but they are restricted to certain contexts, such as in locative inversion or *there*-insertion constructions (Levin and Rappaport, 1995).

[11] However, Greek (unlike other null-subject languages, i.e. Italian) does not have a strong association between postverbal subjects and focus.

Alexopoulou, 1999, among others). Thus, focalisation is expressed mainly by prosodic means while preserving the SV(O) structure, i.e. by stressing the focused element in-situ. Occasionally, syntactic means can also be used to signal focus in English, such as cleft constructions, as shown in (9) (e.g. Dyakonova, 2004).

(9) It was JOHN that Mary saw (not Peter).

Nevertheless, these structures are marked and not frequent in adult speech, and thus English relies mainly on phonological means in order to encode focus in various contexts (e.g. Alexopoulou, 1999; Dyakonova, 2004). English does not employ word order as widely as Greek to mark different focus contexts. In the case of subject placement, in particular, the preverbal subject position in English is not restricted in the same way as in Greek. Subjects are obligatorily preverbal, regardless of the discourse context that the sentence in which they appear occurs, as shown for example in (10), a narrow contrastive focus sentence, and in (11), a wide-focus sentence (see also Schmerling, 1976 and Ladd, 1996 for further examples).

(10) Q: Who broke the glass, John or Nick?
A: [$_F$ JOHN] broke the glass.
(11) Q: What did John do?
A: John [$_F$ broke a GLASS].

Object pronouns

The Greek pronominal system consists of two types of pronouns: strong/emphatic pronouns, which may be found in subject or object position, and clitics, which are the short/non-emphatic forms of the strong personal pronouns of the first, second and third person singular and plural. Both strong and clitic pronouns are morphologically marked for person, gender, number and case (i.e. accusative and genitive case). Furthermore, clitics are used when the speaker does not want to emphasise the pronoun. For the purposes of this paper we will focus on the direct object clitics that are presented in (12).

(12) Singular number: ton/tin/to "him/her/it"
Plural number: tus/tis/ta "them" (masc., fem., neut., respectively)

Object clitics are monosyllabic and unstressed forms that precede the finite verb forms and are used as direct objects of the verb (Holton et al., 1997). An example is shown in (13).

(13) I Eleni to efage.
the Eleni-NOM it-CL ate-3SG
"Eleni ate it."

English has several subclasses of pronouns, including the personal pronouns for the first, the second and the third person, in singular and plural number. Object clitics are not instantiated in English but there are third-person object pronouns that are distinguished with respect to gender and number (i.e. *him*, *her*, *it*, *them*). Object pronouns function mainly as the direct or indirect object of a verb and appear postverbally, as illustrated in (14).

(14) George took it.

The structure of* wh*-embedded interrogatives

English and Greek display overt *wh*-movement in both root and embedded *wh*-interrogatives. In both languages there is obligatory V-movement to C (Subject–Aux/Verb Inversion) in matrix interrogative clauses (Tsimpli, 1990). However, Greek differs from English in that the verb has to be obligatorily in C in embedded *wh*-questions as well. In Greek there is a requirement for the auxiliary/verb to be adjacent to the *wh*-expression irrespective of whether the clause is a root or embedded interrogative (Panagiotidis and Tsiplakou, 2003). As a result, no material (e.g. adverbs, objects) including subjects can intervene between the *wh*-word and the auxiliary/verb both in direct and embedded interrogatives, that is interrogative clauses in Greek do not allow the SV(O) order (Tsimpli, 1990). Therefore, the subject cannot intervene between the *wh*-phrase and the verb in Greek, i.e. the subject cannot appear in the preverbal position and thus it appears postverbally, as shown in (15).

(15) a. Den thimate [ti efage
not remember-3SG what-ACC ate-3SG
i Maria].
the Maria-NOM
"She doesn't remember what Maria ate."
b. *Den thimate [ti i
not remember-3SG what-ACC the
Maria efage].
Maria-NOM ate-3SG
"She doesn't remember what Maria ate."

In contrast, there is no verb-raising requirement (V-movement to C) in embedded *wh*-interrogatives in English, and the subject appears in the preverbal position, as illustrated in (16).

(16) a. He doesn't remember [what Helen wore].
b. *He doesn't remember [what wore Helen].

Hypothesis and predictions

The use of subjects in Greek, i.e. the choice of null and overt pronominal subjects, and the position of subjects before or after the verb, is predicted to be an area vulnerable to crosslinguistic effects from English, in English–Greek bilingual acquisition since: i) it involves the interface between syntax and discourse-pragmatics/information structure; and ii) there is an

overlap between the two languages at the surface level regarding these structures: Greek allows for both null and overt subjects and English provides extensive positive evidence for the overt subject option; similarly, Greek allows for both preverbal and postverbal subjects, but English reinforces the preverbal subject option.[12]

As discussed in the previous sections, null pronominal subjects are obligatory in [−topic shift] contexts in Greek, whereas overt pronominal subjects always signal [+topic shift]. In contrast, overt pronominal subjects are the only option in English and they are not necessarily discourse-marked as shifted topics, as in Greek. The prediction is that the absence of a [± topic shift] constraint in the distribution of overt pronominal subjects in English may affect the distribution of overt pronominal subjects in Greek in [−topic shift] contexts, in which null pronominal subjects are the appropriate choice. Thus, if there is crosslinguistic influence from English to Greek, the bilingual children should use pragmatically inappropriate overt pronominal subjects as coreferential with a subject antecedent, i.e. in [−topic shift] contexts, significantly more often than the Greek monolinguals.

Similarly, in English, focus is mainly expressed by phonological means, while in Greek focus affects word order. Thus, the prediction is that the more rigid SV(O) word order of English, where, regardless of the nature of the focus context, subjects predominantly appear in preverbal position, might influence the distribution of subjects in wide-focus contexts in Greek, so that the use of preverbal subjects will be inappropriately overextended to wide-focus contexts. Therefore, if there is crosslinguistic influence from English to Greek, the bilingual children should use preverbal subjects significantly more frequently than the Greek monolinguals in wide-focus contexts, in which postverbal subjects are the felicitous option.

However, the use of *what*-embedded interrogatives with subject and object pronouns in declaratives is not relevant to the interface between syntax and discourse pragmatics, i.e. these structures are not conditioned by discourse-pragmatic factors and hence they should not be particularly vulnerable to crosslinguistic influence. Therefore, the bilinguals are predicted to place object pronouns appropriately in the relevant contexts in each language, that is, object clitics are expected to be used preverbally in Greek and object pronouns should appear postverbally in English. The bilinguals are also predicted to use the subjects appropriately in *what*-embedded interrogatives, namely they should use preverbal subjects in *what*-embedded interrogatives in English (i.e. there is no verb-raising requirement) and postverbal subjects in Greek (i.e. there is a verb-raising requirement).

In sum, the hypothesis predicts that if there is crosslinguistic influence from English to Greek, the syntax–pragmatics interface constructions in Greek should be found more susceptible to crosslinguistic influence from English than the purely syntactic constructions in both the English-dominant and the Greek-dominant bilingual groups.

Methodology

The recruitment of participants

The screening process resulted in the recruitment of 32 English–Greek bilingual children in total. Sixteen of the bilinguals were English-dominant, born and brought up in the UK (age range: 7;5–9;5; mean age: 8;1) and the remaining sixteen bilinguals were Greek-dominant, born and brought up in Greece (age range: 7;5–9;4; mean age: 8;2). Monolingual control groups of 15 Greek children (age range: 7;5–9;7; mean age: 8;1), 15 English children (age range: 7;5–9;6; mean age: 8), 13 English adults (age range: 22–25; mean age: 24) and 15 Greek adults (age range: 22–26; mean age: 24) were also tested.

In order to treat the English–Greek bilinguals as a single group, the following selection criteria were set: a) The children should be between 7.5–9.6 years old; b) They should not have had any hearing disability or language disorder; c) They should have been regularly exposed to both languages from birth and up to the time of testing; d) Although the bilinguals should be comparatively fluent in both languages, the participants in the UK should be dominant in English and the bilingual subjects in Greece should be dominant in Greek; e) One parent should be a native speaker of English and the other parent a native speaker of Greek and the parents should have used their native language with the child up to the time of testing. However, in the case of the English-dominant bilinguals, bilingual children whose parents were both Greeks were also considered;[13] and f) The parents should not be bilinguals from birth.

[12] A question that arises in this respect is whether the choice of pronominal subjects and subject placement are actually related to the same type of interface. While a proper treatment of this question is complex and falls outside the scope of this study, research has begun to differentiate among interfaces in terms of the nature of the extra-syntactic constraints that are assumed to interact with the syntax and the type of developmental problems that they pose (see Tsimpli and Sorace, 2006). Further differentiations can be made in terms of whether the choices governed by interface conditions are at the lexical level, as in the case of subject pronouns, or at the word order level, as in the case of subject placement. Further research is needed to explore the full impact of these differentiations on language development.

[13] This decision was triggered by the fact that it was very difficult to locate a sufficient number of bilinguals with one English-speaking parent and one Greek-speaking parent in the UK. We also knew of English–Greek bilinguals in the UK whose parents were both Greeks and despite this fact they were dominant in English. Thus, as long as the study's selection criteria were matched there was no reason not to include these bilinguals in the study as well.

The bilingual children's parents completed a short questionnaire as a part of the screening process in order to obtain a more comprehensive picture of the parents' linguistic profile, the bilinguals' input history, the children's sources of input in English and Greek, the amount of input the bilinguals were receiving at the time of testing in either language and the pattern of language use in the family.

For the purposes of this study, in order to determine the bilingual children's dominant language, it was necessary to quantify the amount of exposure the bilinguals had to each language on a regular basis. Thus, the parents were asked (in the questionnaire) to estimate their child's usual overall exposure to each language by considering the amount of exposure their child had to each language in the various social settings in which she participated regularly, e.g. at school, at home, or other social activities. They were asked to provide a proportion that represented the overall amount of input obtained by their bilingual children regularly in each language.

In all cases the parents estimated that their children had more exposure to the community language. Thus, the bilinguals' dominant language was considered to be the language of greatest exposure in the bilinguals' regular interactions, i.e. the Greek-dominant bilinguals in Greece generally received more input in Greek and the English-dominant bilinguals in Britain obtained more input in English. This was not surprising since it has also been noted in the literature that the bilingual children's dominant language is often the community language (e.g. Döpke, 1992; Schlyter, 1993).

The Greek and English monolingual children had to be age-matched to the bilinguals, born and brought up in Greece and the UK, both parents had to be native speakers of Greek and English and they should not have been exposed to languages other than Greek and English respectively. With regard to the adult participants, the English and Greek monolinguals should have never been regularly exposed to Greek or English respectively, in the sense that they had never lived or worked in a Greek or English-speaking country or used Greek or English consistently during their studies.

The English–Greek bilingual children's profile

Greek-dominant bilinguals

All the Greek-dominant bilinguals had a father who was a native speaker of Greek and a mother who was a native speaker of English. The bilinguals had a regular exposure to both Greek and English from birth. The Greek-dominant bilinguals attended Greek state primary schools in which they were taking classes in English for 2–3 hours a week.

The Greek-speaking fathers addressed the children in Greek, while the English-speaking mothers used English most of the time and Greek only occasionally, for example when Greek monolingual visitors were present. In all families, both parents had a good knowledge of each other's language. The children used Greek with their fathers and English with their mothers, although they tended to address their mothers in Greek, for example when discussing school related issues, music or sports classes. According to parental estimates, during the period of data collection the bilinguals spent on average 68% of their time in a monolingual Greek-speaking environment and 32% in a monolingual English-speaking environment.

English-dominant bilinguals

Regarding the English-dominant bilinguals' families, for six of the bilinguals the father was the Greek speaker and the mother was the English speaker; for four of the bilinguals the mother was the Greek speaker and the father was the English speaker. Additionally, for five English-dominant bilinguals both parents were native speakers of Greek, and one bilingual had at the time of testing a Greek-speaking single mother.

The English-dominant bilinguals were regularly exposed to both languages from birth and up to the time of testing. They attended British state/public primary schools and their region's Hellenic school for 2–3 hours a week. The Greek-speaking fathers used mainly Greek with their children and English occasionally, while the mothers addressed the bilinguals in English. The Greek-speaking mothers addressed the bilinguals mostly in Greek but in English as well, e.g. when discussing school related matters, sports activities and music classes. The English-speaking fathers used only English with the children, and all English-speaking parents had a basic knowledge of Greek.

The children in turn used both languages with their Greek-speaking parents and English with their English-speaking parents except for one bilingual who used some Greek with her English-speaking mother.

The bilinguals with the Greek parents were mostly addressed in Greek but English was also frequently used, e.g. when reading English books, dealing with homework and when English monolinguals visitors were present. The children used mainly Greek with their parents for casual daily conversation, but they preferred English for discussing homework and various school related activities. The bilingual child with the single Greek mother was addressed by his parent mainly in Greek but in English as well and the child in turn mirrored the parental input.

The parents estimated that the bilinguals spent on average 70% of their time in a monolingual

English-speaking environment and 30% in a monolingual Greek-speaking environment during the period of data collection.

Materials and procedure

In this study, a number of elicited production tasks and acceptability judgement tasks were administered. All tasks were run on a PC portable computer with a 12" screen. The elicited production tasks were always carried out first in order to avoid any influence from the test items of the acceptability judgement task on the oral responses in the production tasks (because the test items in the acceptability judgement tasks had the same format as the questions and the expected answers in the elicited production tasks).

Every time the experiment was run the items' order of appearance was randomised in each task. A set of four practice items was used before the elicited production and acceptability judgement tasks to familiarise the participants with the task procedure. The experimental session in each language lasted 30–35 minutes, for the bilinguals the second session in the other language started an hour later in order for the participants to rest between the two language experimental sessions. The instructions were given in Greek during the Greek session and in English during the English session at the beginning of each task. All participants were tested at home individually. In all cases, necessary arrangements were made in order for the place of testing to be quiet and without distractions, so that the informants would be able to concentrate on the tasks.

Elicited production task

The elicited production tasks were tape-recorded and consisted of 6 test items and 3 filler items each. For every test item, the participants were shown in PowerPoint one picture with one or more animate characters involved in a certain activity, and subsequently heard the question based on the picture's character(s) and events. After hearing each question, the participants were instructed to give an oral response.

In the case of null and overt pronominal subjects, all the pictures depicted one person participating in a particular event. The questions were relevant to each picture's character and the event depicted, they started with "*why/jati*" and the participants were instructed to begin their answers with the word "*because/epidi*". A felicitous answer in Greek involved the use of a null subject pronoun co-referential with the prominent topic antecedent, i.e. the picture's character mentioned in the question, whereas in English the appropriate answer required the use of an overt subject pronoun, as shown in (17).

(17) Question: Jati pije i Eleni$_j$ sto periptero?
"Why did Eleni$_j$ go to the kiosk?"
Expected answer: Epidi *pro*$_j$ ithele na
because wanted-3SG to
agorasi efimerida.
buy-3SG newspaper-ACC
"Because she$_j$ wanted to buy a newspaper."

In the task for preverbal and postverbal subjects, the pictures showed an interaction between two animate characters and the wide-focus questions were about the event depicted in each picture. In Greek, the felicitous answer to the wide-focus question required the use of postverbal subjects, whereas in English the use of preverbal subjects was required, as shown in (18).

(18) Question: Ti ejine i mpala tis Marias?
"What happened to Maria's ball?"
Expected answer: Tin pire o Janis.
her-CL took-3SG the Janis-NOM
"Janis took it."

As for object pronouns (object clitics in Greek), the pictures showed an animate character doing something to an object or another animate character and the questions referred to the interaction illustrated in each picture. In English, the appropriate answer to the question required the use of a postverbal object pronoun, while in Greek a preverbal object clitic was appropriate, as exemplified in (19).

(19) Question: Ti ekane i Maria sto skilo?
"What did Maria do to the dog?"
Expected answer: Ton haidepse.
him-CL stroked-3SG
"She stroked him."

With respect to embedded interrogatives, the participants were shown the same picture depicting an old lady throughout the experiment. In each test item the old lady would tell the participants what one of her grandchildren had told her, but she did not remember the details afterwards. Then the question was about what the old lady did not remember (i.e. *What doesn't she remember?*/*Ti den thimate?*).

The participants were instructed to answer the question by stating what the old lady did not remember about each character and they were also told to begin their response always with the phrase *Grandmother doesn't remember. . ./I jaja den thimate*, for which the appropriate answer was a *what*-embedded interrogative with a subject (i.e. the subject would be the name of the person mentioned in the old lady's statement). In Greek, the verb is adjacent to *ti* "what" and the subject is postverbal, whereas in English the verb does not appear next to *what* since the subject is preverbal, as shown in (20).

(20) Old lady: O Nikos mu ipe ti efage ala den thimame tora.
"Nick told me what he ate but I don't remember now."
Question: Ti den thimate?
"What doesn't she remember?"
Expected answer: I jaja den thimate ti efage o Nikos.
the grandmother-NOM not remember-3SG what ate-3SG the Nikos-NOM
"Grandmother doesn't remember what Nikos ate."

Acceptability judgement task

The acceptability judgement tasks (forced-choice) consisted of six test items and three filler items each. For every experimental item the participants were shown an MPEG video, in which two hand puppets and another person (in most tasks) were present. Except for the *what*-embedded interrogatives, where only the two puppets participated, in the other tasks a native speaker of Greek/English was also present and asked the two puppets a question that they both answered. Regarding the task for the *what*-embedded interrogatives, the puppets were not asked a question but for every test item each of the puppets used one sentence that included a *what*-embedded interrogative with a subject. After hearing each experimental item, the children were instructed to point to the puppet whose answer or sentence (in the case of *what*-embedded interrogatives) they thought was the most appropriate in English or Greek.

In all tasks, both sentences produced by the puppets in each experimental item had the same semantic content and they were lexically identical, but the structures of interest appeared in different positions (e.g. preverbal vs. postverbal subjects). The exception was the task for the null and overt pronominal subjects, in which a null or overt subject pronoun was used instead in each of the puppets' answers.

In the task for null and overt pronominal subjects, all the questions were about a character's activity and they were followed by the two answers produced by the two puppets in both language sessions, one puppet used a sentence with a null pronominal subject and the other puppet used a sentence with an overt pronominal subject. In Greek, the pragmatically appropriate answers were the sentences with null pronominal subjects co-referential with the prominent topic antecedent mentioned in the question, as shown in (21), where the symbol @ indicates that the overt pronominal subject is pragmatically unacceptable in this context.

(21) Question: Jati pije o Jorgos$_j$ sto vivliopolio to proi?
"Why did Jorgos go to the bookshop this morning?"
Puppet A (null subj.): Epidi *pro*$_j$ ithele na agorasi ena vivlio.
because wanted-3SG to buy-3SG a book-ACC
"Because he wanted to buy a book."
Puppet B (overt subj.): @Epidi aftos$_j$ ithele na agorasi ena vivlio.
because he-NOM wanted-3SG to buy-3SG a book-ACC
"Because he wanted to buy a book."

By contrast, the appropriate answers in English were the sentences with overt pronominal subjects referring also to the subject antecedent, as illustrated in (22).

(22) Question: "Why did George$_j$ go to the bookshop this morning?"
Puppet A (null subj.): *Because *pro* wanted to buy a book.
Puppet B (overt subj.): Because he$_j$ wanted to buy a book.

In the task for preverbal and postverbal subjects in wide-focus contexts, there was a wide-focus question followed also by the two puppets' answers in the two languages. One puppet used a sentence with a postverbal subject and the other puppet used a sentence with a preverbal subject. In Greek, the pragmatically felicitous answers were the sentences with postverbal subjects, whereas in English the appropriate answers were the sentences with preverbal subjects, as shown in (23) and (24), respectively:

(23) Question: Ti ejine to molivi tis Marias?
"What happened to Maria's pencil?"
Puppet A (postv.subj.): To pire i Hara.
it-CL took-3SG the Hara-NOM
"Hara took it."
Puppet B (prev.subj.): @I Hara to pire.
the Hara-NOM it-CL took-3SG
"Hara took it."

(24) Question: "What happened to John's pencil?"
Puppet A (postv.subj.): *Took it Maria.
Puppet B (prev.subj.): Maria took it.

In the task for object pronouns (object clitics in Greek), the question was also followed by the puppets' answers in both languages: one puppet used a sentence with a preverbal object clitic and the other puppet used a sentence with a postverbal object pronoun. The grammatically appropriate answers for Greek were the sentences with preverbal object clitics, as illustrated in (25), whereas for English the grammatically acceptable answers were the sentences with postverbal object pronouns, as exemplified in (26).

(25) Question: Pios vrike to molivi mu?
"Who found my pencil?"
Puppet A (prev. object clitic): I Elena to vrike.
the Elena-NOM
it-CL found-3SG
"Elena found it."
Puppet B (postv. object clitic): *I vrike to.
the Elena-NOM
found-3SG it-CL
"Elena found it."

(26) Question: Who found my pencil?
Puppet A (prev. object pronoun): *Nick it found.
Puppet B (postv. object pronoun): Nick found it.

In the task for embedded interrogatives, no questions were asked: each of the puppets used a sentence that consisted always of the same matrix clause followed by a *what*-embedded interrogative with a subject in both languages. In one of the sentences the subject occurred postverbally in the *what*-embedded interrogative (the verb was adjacent to *what*/*ti*), while in the other sentence the subject appeared preverbally in the *what*-embedded interrogative (the verb was not adjacent to *what*/*ti*). In Greek, the grammatically appropriate items were the ones in which the *what*-embedded interrogatives had postverbal subjects, whereas in English the grammatically acceptable items were the ones in which the interrogatives had preverbal subjects, as exemplified in (27) and (28), respectively.

(27) Puppet A (postv.subj.): Den thimate [ti efage i Maria].
not remember-3SG
what ate-3SG the Maria-NOM
"She doesn't remember what Maria ate."
Puppet B (prev.subj.): *Den thimate [ti i Maria efage].
not remember-3SG
what the Maria-NOM
ate-3SG
"She doesn't remember what Maria ate."

(28) Puppet A (prev.subj.): She doesn't remember [what Mary wore].
Puppet B (postv.subj.): *She doesn't remember [what wore Mary].

Coding

The responses produced by each participant in all tasks were transcribed and coded. With respect to the elicited production tasks, one point was given for each target response that the participants produced. A hundred per cent accuracy in performance would yield a maximum accuracy score of six, since each task included six experimental items. In the acceptability judgement tasks, the number of times the participants indicated the puppet whose response/sentence was the target one was calculated. One point was given for each target response in all tasks and participants would obtain a maximum accuracy score of six (since there were six experimental items in each task).

Results

In the following section the results of all the experimental tasks in English and Greek respectively will be presented.

English

Figures 1 and 2 present the results from all the tasks and structures in English. Figure 1 reports the mean scores for the use of overt pronominal subjects in [−topic shift] contexts and for the use of preverbal subjects in wide-focus contexts in both the elicited production and acceptability judgement tasks. Figure 2 presents the group mean scores for the use of preverbal subjects in w*hat*-embedded interrogatives and for the use of postverbal object pronouns in declaratives in the elicited production and acceptability judgement tasks.

As shown in both figures, the monolingual and bilingual groups exhibited 100% accuracy in their preferences in all structures and tasks and therefore no further statistical analysis was carried out. As a result, there was no evidence for crosslinguistic influence from Greek to English, as originally predicted.

Greek

Unlike their performance patterns in English, the groups did not perform identically in Greek, as shown in Figures 3 and 4. Figure 3 presents the mean scores for the use of null pronominal subjects in [−topic shift] contexts and the use of postverbal subjects in wide-focus contexts in both tasks. All groups performed at ceiling in the elicited production task for the use of null subject pronouns, but they had a different performance in the acceptability judgement task. Similarly, the groups had a variable performance in both tasks with regard to the use of postverbal subjects in wide-focus contexts. Figure 4 presents the mean scores

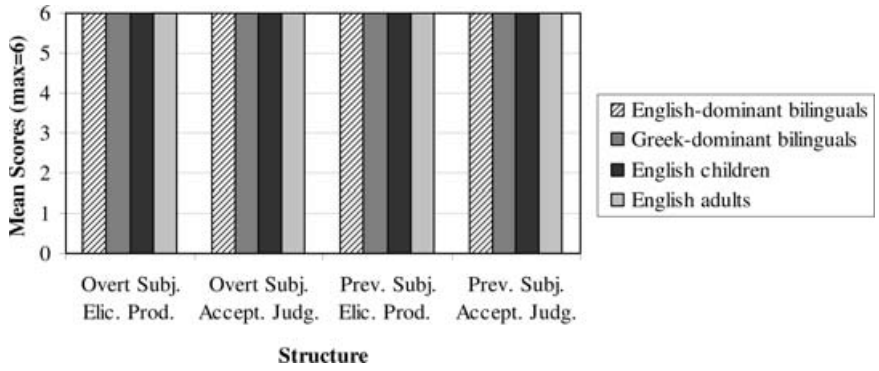

Figure 1. The use of overt pronominal subjects in [−topic shift] contexts and the use of preverbal subjects in wide-focus contexts.

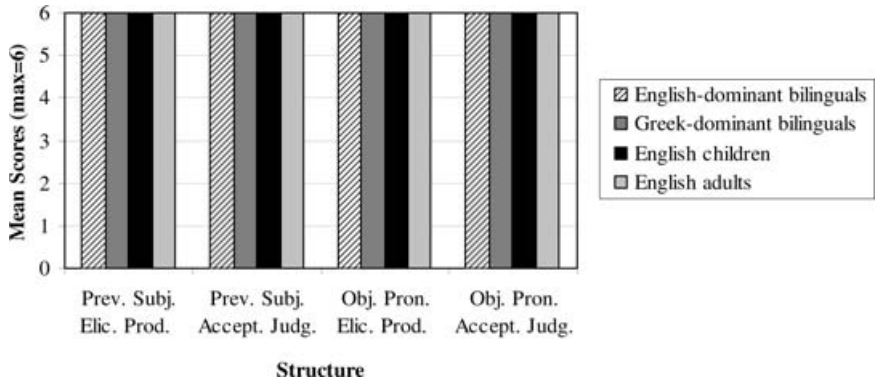

Figure 2. The use of preverbal subjects in w*hat*-embedded interrogatives and the use of postverbal object pronouns in declaratives.

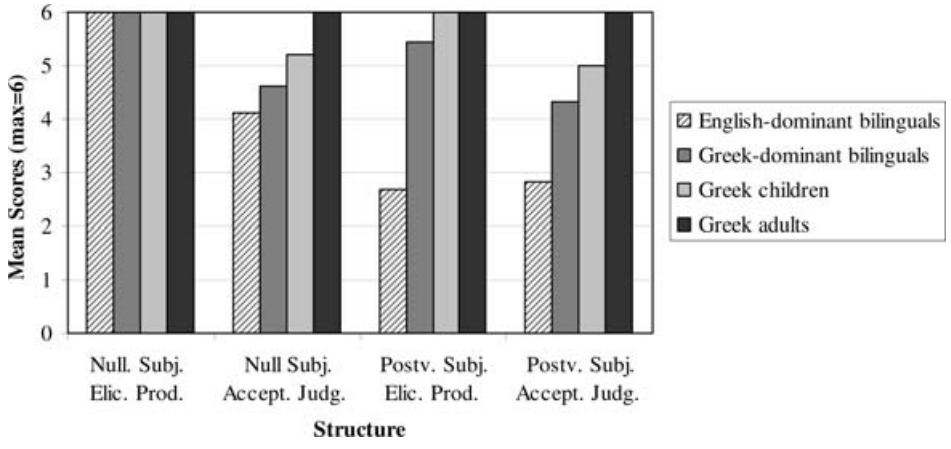

Figure 3. The use of null pronominal subjects in [−topic shift] contexts and the use of postverbal subjects in wide-focus contexts.

with respect to the use of postverbal subjects in *what*-embedded interrogatives and the placement of object clitics in declaratives in both the elicited production and acceptability judgement tasks.

As shown in Figure 4, the four groups performed differently in both tasks for *what*-embedded interrogatives but all participants were at ceiling in the tasks for the placement of object clitics. The Greek data were analysed using a mixed Group × (Structure × Task) ANOVA with Group as the between-subjects factor (English-dominant bilinguals, Greek-dominant bilinguals, Greek children, Greek adults), Structure (null subjects, postverbal subjects, *what*-embedded questions, object clitics), and Task (elicited production

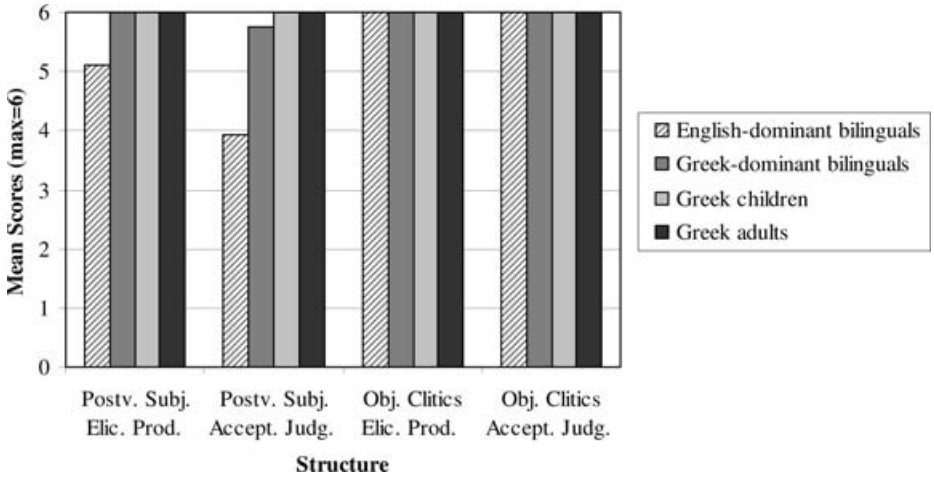

Figure 4. The use of postverbal subjects in w*hat*-embedded interrogatives and the use of preverbal object clitics in declaratives.

Table 1. *The use of null pronominal subjects in [−topic shift] contexts in both tasks (out of 6) group.*

	English-dominant bilinguals	Greek-dominant bilinguals	Greek children	Greek adults
Elicited Prod. Task				
Null sub.: Mean (SD)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)
Accept. Judg. Task				
Null sub.: Mean (SD)	4.13 (1.82)	4.63 (1.78)	5.20 (1.32)	6.00 (0.00)

(EP) and acceptability judgement (AJ) task), as the within-subjects factors. The results from the mixed ANOVA showed a significant main effect for Group ($F(3,58) = 31.62$; $p < .001$), for Task ($F(1,58) = 30.20$; $p < .001$), and for Structure ($F(3,174) = 37.35$; $p < .001$). The following interactions were also significant: Structure × Group ($F(9,174) = 15.13$; $p < .001$), Task × Group ($F(3,58) = 3.82$; $p < .005$), Structure × Task ($F(3,174) = 7.34$; $p < .001$), Structure × Task × Group ($F(9,174) = 3.12$; $p < .01$). Post hoc comparisons using the Tukey test revealed a significant mean score difference between the English-dominant bilingual group and all the other groups, that is, the Greek-dominant bilinguals ($p < .001$), the Greek monolingual children ($p < .001$) and the Greek monolingual adults ($p < .001$). There was also a significant difference between the Greek adults and the Greek-dominant bilinguals ($p < .05$).

The significant between-groups mean differences revealed by the post hoc test were followed by a series of one-way ANOVAs in order to identify the source of the between groups significant differences. Thus, separate one-way ANOVAs were conducted with the elicited production and acceptability judgement tasks in each structure as the dependent variables (e.g. postverbal subjects in the acceptability judgement task; postverbal subjects in the elicited production task, etc.). The descriptive statistics for each structure's task and the results from the one-way ANOVAs and the post hoc tests are presented in the next sections.

The syntax–pragmatics interface structures

The use of null pronominal subjects

Table 1 exhibits the mean scores and standard deviation for the elicited production and the acceptability judgement task with respect to the use of null pronominal subjects in [−topic shift] contexts. As shown, all groups performed identically in the elicited production task and thus, no further statistical analysis was carried out on this data. In the acceptability judgement task, it was only the adult group that performed at ceiling but the child groups did not; the bilingual and to a lesser extent the monolingual children were found to accept inappropriate overt pronominal subjects in contexts in which null subject pronouns were felicitous. The results from the one-way ANOVA analysis showed a significant difference between

Table 2. *The use of postverbal subjects in wide-focus contexts in both tasks (out of 6) group.*

	English-dominant bilinguals	Greek-dominant bilinguals	Greek children	Greek adults
Elicited Prod. Task				
VS: Mean (SD)	2.69 (2.77)	5.44 (1.15)	6.00 (0.00)	6.00 (0.00)
Accept. Judg. Task				
VS: Mean (SD)	2.81 (1.28)	4.31 (1.25)	5.00 (1.07)	6.00 (0.00)

Table 3. *The use of postverbal subjects in* what- *embedded interrogatives in both tasks (out of 6) group.*

	English-dominant bilinguals	Greek-dominant bilinguals	Greek children	Greek adults
Elicited Prod. Task				
VS: Mean (SD)	5.12 (1.59)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)
Accept. Judg. Task				
VS: Mean (SD)	3.94 (1.73)	5.75 (0.58)	6.00 (0.00)	6.00 (0.00)

the four groups ($F(3,58) = 4.76$; $p < .01$). The Tukey post hoc test showed only one significant mean difference and that was between the English-dominant bilinguals and the Greek adults ($p < .01$). There were no significant mean differences between the English-dominant bilingual group and the other children's groups. The findings from the judgement task therefore cannot conclusively support the prediction regarding the vulnerability of the overt pronominal subjects' use to crosslinguistic influence from English to Greek in the bilingual groups.

The use of postverbal subjects in wide-focus contexts

Table 2 displays the mean scores and standard deviation for both tasks for the use of postverbal subjects in wide-focus contexts. As illustrated in Table 2, the adults exhibited ceiling performance in both tasks but the children's groups did not perform identically in either task. The results from the one-way ANOVA showed a significant difference between the four groups in both the elicited production task ($F(3,58) = 16.94$; $p < .001$), and the acceptability judgement task ($F(3,58) = 25.31$; $p < .001$). The Tukey post hoc test indicated that the English-dominant bilinguals were significantly different from all the other groups in both tasks, i.e. elicited production task: Greek-dominant bilinguals ($p < .001$), Greek children ($p < .001$), Greek adults ($p < .001$); acceptability judgement task: Greek-dominant bilinguals ($p < .01$), Greek children ($p < .001$), Greek adults ($p < .001$). In addition, the mean difference between the Greek-dominant bilinguals and the Greek adults in the acceptability judgement task was statistically significant ($p < .001$). However, the Greek-dominant bilingual group was not significantly different from the Greek children.

The English-dominant bilinguals were found to use and accept wide-focus sentences in which the subjects were preverbal and not postverbal, as is the felicitous option, significantly more often than the Greek monolinguals and the Greek-dominant bilinguals. Thus, although the distribution of preverbal subjects was predicted to be susceptible to crosslinguistic influence from English to Greek in both bilingual groups, transfer effects were evident only in the English-dominant bilingual group.

The narrow syntax structures

The use of postverbal subjects in* what- *embedded interrogatives

Table 3 exhibits the mean scores and standard deviation from the elicited production and acceptability judgement task with respect to the use of *what*-embedded interrogatives with a subject. The Greek-dominant bilinguals and the Greek control groups were very accurate in their performance in the two tasks since they used postverbal subjects appropriately in *what*-embedded interrogatives. However, the English-dominant bilinguals were not as accurate. The one-way ANOVA showed a significant difference between the four groups in the elicited production task ($F(3,58) = 3.03$; $p < .01$), and the acceptability judgement task ($F(3,58) = 15.66$; $p < .001$). In fact, the Tukey post hoc test revealed a significant difference between the English-dominant bilinguals and the other groups in both tasks, i.e. elicited production task: Greek-dominant

Table 4. *The use of preverbal object clitics in declaratives in both tasks (out of 6) group.*

	English-dominant bilinguals	Greek-dominant bilinguals	Greek children	Greek adults
Elicited Prod. Task				
clV: Mean (SD)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)
Accept. Judg. Task				
clV: Mean (SD)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)	6.00 (0.00)

bilinguals ($p < .05$), Greek children ($p < .05$), Greek adults ($p < .05$); acceptability judgement task: Greek-dominant bilinguals ($p < .001$), Greek children ($p < .001$), Greek adults ($p < .001$).

Unlike our predictions, the results from both tasks for *what*-embedded interrogatives with a subject indicated that crosslinguistic influence from English to Greek was evident only in the English-dominant bilingual group. The English-dominant bilinguals were significantly different from the other groups in using and accepting syntactically inappropriate preverbal subjects in *what*-embedded interrogatives, where postverbal subjects are the grammatical option.

The use of preverbal object clitics in declarative sentences

Table 4 reports the mean scores and standard deviation from the elicited production and acceptability judgement task for the placement of object clitics in declaratives. All the groups performed at ceiling in both the elicited production and the acceptability judgement task, as shown in Table 4, and thus no further statistical analysis was carried out. All the participants used and accepted declaratives in which object clitics appeared preverbally and thus, no crosslinguistic effects were found in the placement of object pronominal clitics in declaratives, as predicted.

Discussion

These findings raise a number of important questions about the original hypothesis of the study (i.e. that crosslinguistic influence would occur only at interfaces, regardless of dominance), and more generally about the developmental mechanisms that might be responsible for the patterns obtained. Three aspects of the results, in particular, have potentially important implications for theories of bilingual development.

First, the data presented support the prediction regarding the directionality of crosslinguistic effects. Crosslinguistic influence occurred from English to Greek, but not vice versa, as expected. Directionality and dominance, however, seem to be related. Thus, although it was predicted that crosslinguistic influence of English on Greek would be observed in both bilingual groups, it is only evidenced in the English-dominant bilingual group. This asymmetry indicates that the bilinguals' degree of exposure to their two languages has a role to play in determining the likelihood of crosslinguistic influence. However, it cannot be the sole factor since there was no crosslinguistic influence from Greek to English in the Greek-dominant group. Moreover, not all structures were vulnerable to crosslinguistic effects in the English-dominant bilinguals; object clitics, in fact, were not problematic.

Second, the prediction that both the syntax–pragmatics interface constructions in Greek would be vulnerable to crosslinguistic influence from English is only partially supported, since one syntax–pragmatics interface structure – subject placement in wide-focus contexts – was clearly open to crosslinguistic influence in the English-dominant bilinguals, but the other – the choice of subject pronouns – was not. Although overall the bilinguals were sensitive to the discourse appropriate distribution of null and overt subject pronouns in Greek, in the judgement task they tended to accept more frequently than the Greek monolinguals a number of pragmatically infelicitous overt subject pronouns in contexts in which a null subject would have been appropriate. However, there was only one significant difference, between the English-dominant bilinguals and the adults, and thus this finding does not provide conclusive evidence about crosslinguistic influence from English.

Third, contrary to the study's prediction, subject placement in *what*-embedded interrogatives (a purely syntactic structure), was also found to be vulnerable to crosslinguistic influence from English, while the distribution of object clitics was target-like in all groups as predicted.

Let us examine these points in turn. As predicted, due to crosslinguistic influence from English to Greek, the English-dominant bilingual children overextended preverbal subjects to wide-focus contexts, in which post-verbal subjects would be the felicitous option. Preverbal subjects, however, were also extended to syntactically inappropriate contexts in Greek, i.e. *what*-embedded

interrogatives, contrary to prediction. These findings indicate that the surface overlap between the two languages regarding the use of preverbal and postverbal subjects is an important determinant of crosslinguistic influence in both the syntax–pragmatics interface and purely syntactic structures; but language dominance is also a contributing factor (for similar findings in young bilinguals see Yip and Matthews, 2000; Bernardini, 2003). What are the implications for the narrow syntax vs. interface distinction?

One possibility is that there is, in fact, no distinction, and that the same argument developed for interface phenomena also applies to narrow syntax, that is, there is a surface overlap between Greek and English, in the sense that Greek allows for both preverbal and postverbal subjects, but each of these options appears in restricted discourse-pragmatic contexts and in restricted syntactic environments (in subordinate clauses); the plentiful evidence from English (a language that allows only preverbal subjects) strengthens this option and leads to its extension to the wrong discourse-pragmatic or syntactic environment in the English-dominant bilinguals who, by definition, have greater exposure to English than to Greek. These bilinguals' preference for a preverbal subject in Greek focused constructions violates a (weak) discourse/information structure constraint, while in *what*-embedded clauses discourse is not relevant, but the preference for a preverbal subject carries over in both constructions from English precisely because it is both overwhelmingly frequent in the input obtained by the English-dominant bilinguals and not subject to any restriction, in contrast to Greek.

The finding that crosslinguistic influence was not evident in the Greek-dominant bilingual group could be due to the fact that, unlike their English-dominant bilingual peers, the Greek-dominant bilinguals' amount of exposure to English in general, and to preverbal subjects in particular, was not sufficiently high to affect Greek, their dominant language. In a similar vein, Serratrice (in press) claimed that the fact that the vast majority of the 12 English–Italian eight-year-old bilinguals of her study had higher exposure to Italian (since they were living in Italy) could be one of the reasons why crosslinguistic influence did not take place from English to Italian with respect to the distribution of overt subject pronouns; the amount of input the bilinguals obtained in English was not sufficiently high to have any crosslinguistic effects for the children's dominant language, Italian. Thus, even though a structure may overlap in the two languages, the potential crosslinguistic influence that would be predicted on structural grounds may not manifest itself if there is not sufficient input that would tip the balance in its favour.

Why were object clitics not subject to crosslinguistic influence from English to Greek in either bilingual group? If core syntactic structures are as open to crosslinguistic influence as interface structures, provided that there is a surface overlap (i.e. Greek instantiates both postverbal strong object pronouns and preverbal object clitic pronouns, whereas English allows only postverbal object pronouns), one might expect to find crosslinguistic effects in this domain too, manifested in the extension of postverbal strong object pronouns to contexts in which Greek requires an object clitic (see Serratrice et al. (2004) for similar predictions in English–Italian bilingual children; see also Zobl (1980) for such findings in second language acquisition) or in the misplacement of object clitics.[14] Placement errors with regard to object clitics are well attested in young bilingual children acquiring a Romance and a Germanic language (Hamann and Belletti, 2005; Belletti, 2006) and have been explained on the basis of the children's misanalysis of clitics as weak or strong pronouns (Cardinaletti and Starke, 1999); this misanalysis could be due to the combined influence of the structural "economy" of the weak/strong pronouns and the effects of the Germanic language, which lacks clitic pronouns but has weak/strong pronouns in the pronominal system. It is possible that the older bilingual children tested in this study are beyond this stage, and thus, such errors may have occurred earlier in their language development.

Overt subject pronouns, contrary to prediction, were not found to be susceptible to crosslinguistic influence, although the use of null vs. overt subject pronouns also instantiates a surface overlap between Greek and English. This result is inconsistent with previous studies of young bilinguals acquiring a Romance and a Germanic language simultaneously from birth, who have been found to overgeneralise overt subject pronouns to discourse pragmatically inappropriate contexts (Paradis and Navarro, 2003; Serratrice et al., 2004). However, despite the fact that crosslinguistic influence in the distribution of overt pronominal subjects did not appear at this developmental stage, it is possible, as in the case of object clitics, that both the English-dominant and the Greek-dominant bilinguals may have passed through earlier developmental stages in which they did overgeneralise overt subject pronouns inappropriately. In a related vein, the Greek-dominant bilinguals may have passed through a similar earlier developmental phase in which they used to overextend the use of preverbal subjects, but due to less sustained and regular exposure to English they may have converged with the Greek monolinguals sooner than the English-dominant bilinguals.[15]

[14] In the present study, however, only the second possibility, that is, the misplacement of object clitics was investigated in the acceptability judgement task; no placement errors were found. Furthermore, neither type of errors was found in the elicited production task.

[15] An anonymous reviewer points out that not only the Greek-dominant bilinguals, but also the Greek children could have passed through a

The alternative possible explanation for the fact that crosslinguistic effects were found in both narrow syntax and interface structures is that the effects do not pertain to the representational level, but rather to the level of processing.[16] Research on monolingual acquisition has shown that many of the characteristics of child grammar which were regarded as exclusively grammatical in nature are in fact best explained as having a syntactic basis compounded with the inefficiency of processing resources (Avrutin, 1999, 2004; Rizzi, 2002) The off-line data presented in this study do not lend themselves to a full exploration of this scenario, but it is nevertheless possible to speculate that this type of account allows us to integrate one of the more puzzling features of the original hypothesis: its reliance on surface features of the input. It is well known that monolingual children are not dependent on the surface features of the input; it is also established that bilingual children do not make errors of transfer, acceleration or delay in the acquisition of the syntax of one of their languages due to the presence of the other language (e.g. Paradis and Genesee, 1996). Why would then bilingual children be led astray by the surface overlap between languages? It is possible that their processing strategies – rather than their grammars – may be more dependent on surface input than in monolingual children: in other words, bilingual children, because of the increased processing burden of handling two languages, may employ "shallow" processing strategies, particularly when dealing with structures whose instantiation, in one of their languages, is subordinated to complex conditions in particular pragmatic or syntactic contexts.[17] The resort to shallow processing may be affected by the overall quantity of input received, since with less input children have fewer opportunities to coordinate the choice of syntactic options with the appropriate (syntactic or discourse) conditions (Sorace, 2005).

It is important to stress that the English-dominant bilingual children can, and occasionally do, use postverbal subjects in Greek in the relevant discourse-pragmatic and syntactic contexts appropriately. Their grammatical knowledge is not affected.[18] Nevertheless, they are not consistent in applying the appropriate discourse constraints for the placement of subjects in the wide-focus contexts and the appropriate syntactic constraints for the position of subjects in *what*-embedded interrogatives. The overwhelming frequency and less constrained use of preverbal subjects in the English input could influence the English-dominant bilinguals' effective processing of the Greek input, leading them to produce and accept pragmatically[19] and syntactically inappropriate preverbal

(perhaps very brief) stage in which they produced the same errors as the bilinguals. In the absence of direct relevant evidence, it would be difficult to go beyond speculation. It should be noted, however, that monolingual children acquiring null subject languages, such as Spanish (Paradis and Navarro, 2003), Greek (Stephany, 1997; Tsimpli, 2005) and Italian (Serratrice et al., 2004) seem to be aware of the discourse-pragmatic factors that govern subject pronominal use in the target language from early on and thus, on the whole, they tend to omit subject pronouns rather than supply them when they are not necessary. The same reviewer also suggests that a structure could be problematic in both monolingual and bilingual acquisition, but to a greater extent for bilinguals (who would therefore produce significantly more errors over a longer stage). It is difficult, however, to substantiate this claim on the basis of the data presented in this study. Although the Greek children occasionally made some errors regarding the distribution of overt and preverbal subjects ONLY in the judgement tasks, this does not necessarily imply that these domains are generally problematic in Greek monolingual acquisition. In fact, the Greek children performed at ceiling in the elicited production task in both domains, which shows that they are able to produce the pragmatically appropriate answer in the required discourse-pragmatic contexts; recall that there were no significant differences between the Greek adults and the Greek children in any of these tasks. Furthermore, assuming that the difference between bilinguals and monolinguals may be only a matter of degree could not account for the fact that *what*-embedded interrogatives are not problematic in the Greek children or the Greek-dominant bilinguals, and for the lack of crosslinguistic influence in the Greek-dominant bilinguals.

[16] A reviewer comments that the Müller and Hulk hypothesis might be interpreted as a processing hypothesis, in the sense that the ambiguity would be not at the level of structures, but at the level of parses that might becomputed in language A, one of which is preferred by the child because it is also available in language B. This construal, according to the reviewer, would imply that the Müller and Hulk hypothesis has norelevance for acquisition, since claims about processing imply syntactic knowledge that has already been acquired. While we agree with the extension of the scope of Müller and Hulk hypothesis so that it encompasses both representational and processing factors, we disagree with the reviewer's conclusions precisely because both knowledge and processing are part of a theory of acquisition, and in particular they are both necessary to an explanation of how 'interface' phenomena are acquired.

[17] A study by Clahsen and Felser (2006) shows that adult late bilinguals often engage in "shallow" processing, which results in privileging non-structural (semantic or pragmatic) cues at the expense of structural analyses. It remains to be seen whether early and late bilinguals employ different types of "shallow" processing strategies.

[18] The fact that these bilingual children can and do use postverbal subjects appropriately, although in a minority of cases, suggests that they are not "incomplete acquirers" of Greek like, for example, the descendants of first-generation Spanish immigrants in the US studied by Montrul (2004). One can assume that incomplete acquirers are exposed to input that is not only quantitatively, but also qualitatively different from the input received by monolinguals, and that it does not include (sufficient) evidence for certain constructions.

[19] L1 English near-native speakers of Italian and Spanish have also been found to overgeneralise preverbal subjects in discourse contexts which require the use of postverbal subjects but they do not extend postverbal subjects to inappropriate contexts (Belletti, Bennati and Sorace, 2005; Hertel, 2003). L1 Greek speakers under attrition from English were also shown to prefer the preverbal subject position in all-focus contexts to a greater extent than the controls (Tsimpli et al., 2004). The interesting question is whether this phenomenon is due to the same causes in these different bilingual populations and in the early bilinguals tested in this study.

subjects significantly more often than the Greek-dominant bilinguals and the Greek monolingual groups.

Conclusion

This study provides evidence that crosslinguistic influence can persist over time and can unidirectionally affect both narrow syntax and syntax–pragmatics interface structures in the performance of eight-year-old English–Greek bilingual children. Crosslinguistic effects from English to Greek, however, were found to be constrained by conditions that were partly different from those hypothesised by recent research. A surface overlap between two languages in bilingual acquisition may provide a potential for crosslinguistic influence; this particular factor seems to be the main determinant of the directionality of crosslinguistic influence. The effects, however, are not found in all syntax–pragmatics interface structures, nor do they appear to be restricted to this interface, since they were also obtained in some narrow syntax structures. Furthermore, the actual occurrence of crosslinguistic interaction seems to be at least partially affected by the amount of input received, since it is manifested only in English-dominant children. The different facets of this pattern of results are consistent with the view that crosslinguistic effects, in older bilingual children, may affect the level of processing, rather than that of grammatical representations, which are probably target-like at this later stage of development. While no firm conclusions can be drawn on the basis of this study alone, future research will find theoretically and methodologically appropriate ways to disentangle representational and processing effects in bilingual language development.

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