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(A)symmetries in the Acquisition of Principle B in Typically-Developing and Specifically Language-Impaired (SLI) Children

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1. Introduction

Cross-linguistic research on the acquisition of pronominal reference has established the following asymmetry: English-speaking children between 3 and 6 years old often allow ordinary pronouns to corefer with an interclausal c-commanding antecedent (Chien & Wexler 1990, Wexler & Chien 1985, among others). This phenomenon, known as the Delay of Principle B Effect (DPBE), has also been attested in Russian (Avrutin & Wexler 1992), Dutch (Philip & Coopmans 1996, Baauw 1999) and Icelandic (Sigurjónsdóttir 1992). In contrast, the DPBE appears to be absent in Romance languages such as, Italian (McKee 1992), Spanish (Padilla 1990, Baauw, Escobar & Philip 1997) and French (Hamann, Kowalski & Philip 1997). The aforementioned asymmetry between these languages has been attributed to the difference in pronoun type (i.e. strong vs. clitic). This asymmetry has also been attested in Specific Language Impairment (SLI): the rate of intrasentential coreference errors appears to be higher in English SLI children (van der Lely & Stollwerck 1997) than in French SLI children (Jakubowicz, Nash, Rigaut & Gérard 1998).

The purpose of this paper is to investigate the extent to which the asymmetry between clitics and strong pronouns proposed in previous studies holds within a single language that allows both clitics and strong pronouns. We draw empirical evidence from the acquisition of pronominal reference by Greek-speaking typically-developing and SLI children. The paper is organized as follows: Section 2 provides background assumptions on the acquisition of Principle B in typical development and SLI. Section 3 provides a description of the morphosyntactic properties of strong pronouns and clitics in Greek. Section 4 is concerned with the experimental study. Last, section 5 provides an analysis of the results and considers the cross-linguistic evidence.

2. Background Assumptions

2.1 The DPBE

Experimental studies in a variety of languages have shown that children between 3 and 6 years old often appear to violate Principle B of the Binding Theory (Chomsky 1981, 1986), by allowing pronouns to take interclausal antecedents in contexts such

as (1) (Wexler & Chien 1985, Chien & Wexler 1990, for English; Sigurjónsdóttir, 1992, for Icelandic; Avrutin & Wexler 1992, for Russian; Philip & Coopmans 1996, for Dutch; among others).

(1) a. Papa Bear$_i$ covered him$_i$ (child language)

    b. Papa Bear$_i$ covered him$_{*i/j}$ (adult language)

However, this effect, called the Delay of Principle B Effect (DPBE), is almost absent in contexts with a quantificational antecedent, as in (2) (Chien & Wexler 1990, Philip & Coopmans 1996):

(2) Every bear$_i$ covered him$_{*i/j}$ (adult and child language)

Furthermore, it has been shown that Romance-speaking children exhibit almost 100% adult-like performance in contexts involving a clitic instead of a strong pronoun (McKee 1992, for Italian; Padilla 1990, Baauw, Escobar & Philip 1997, for Spanish; Hamann, Kowalski & Philip 1997, for French):

(3) Gianni$_i$ lo$_{*i/j}$ asciuga   (adult and child Italian)
    John him-clitic dries
    'John dries him'

There is a general consensus that the DPBE is not due to lack of syntactic knowledge but due to pragmatic or performance errors (Chien & Wexler 1990, Grimshaw & Rosen 1990, Grodzinsky & Reinhart 1993). The adult-like performance of children in contexts with an overt operator indicates that Principle B is available from the onset just like the other Principles of the Binding Theory (Jakubowicz 1984, Wexler & Chien 1985, McDaniel, Cairns & Hsu 1990, for Principle A; Crain & McKee 1985, McDaniel, Cairns & Hsu 1990, for Principle C). According to Grodzinsky & Reinhart (1993), the DPBE is due to young children's processing incapability to execute Rule I, a pragmatic rule that rules out coreference between a referential NP and a pronoun in the same clause:

(4) *Rule I: Intrasentential Coreference* (Grodzinsky & Reinhart 1993)
    NP A cannot corefer with NP B, if replacing A with C, C a variable
    A-bound by B, yields an indistinguishable interpretation.

To apply Rule I, a listener must maintain two structural representations in memory at the same time, one with a reflexive interpretation of the pronoun and one with an ordinary interpretation. Due to limitations on working memory, some children cannot maintain the two representations in memory long enough to decide which is the intended one, so they adopt a guessing strategy about the coreference relation between the pronoun and the local antecedent, which leads them to roughly 50% non-adult-like performance.[1]

The asymmetry between English and Romance with respect to the DPBE has been attributed to the difference in pronoun type (strong pronouns vs. clitics).

McKee (1992), on the one hand, suggests an account in terms of different binding domains for clitics and strong pronouns. Avrutin & Wexler (1992), on the other hand, argue that the absence of the DPBE in clitic contexts is due to the fact that clitics are subject to binding and not to coreference. Unlike strong pronouns, clitics cannot refer deictically, thus, they get an interpretation by establishing a dependency with an antecedent through coindexation. Along a similar line, Baauw, Escobar & Philip (1997) argue that the lack of the DPBE in Romance is due to the fact that clitics are underspecified for the feature [human] (Delfitto & Corver 1993, Cardinaletti & Starke 1994). Pronouns (strong and clitic) must be specified for this feature in order for their phi-features to be interpreted at LF (Delfitto & Corver 1993). Therefore, clitics must be bound (i.e. coindexed with an antecedent) either in syntax or in discourse in order to get a value for this feature.

2.2 The DPBE in SLI

Recent studies on the acquisition of pronominal reference in SLI children appear also to reveal the same asymmetry between strong pronouns and clitics. Van der Lely & Stollwerck (1997) report the results of a study of 12 English-speaking SLI children, aged 5;9 to 9;1, using a picture-sentence judgment task. They argue that English SLI children's chance level of performance in their assignments of pronominal reference is similar to that found in English typically-developing children of less than 5 years of age (Chien & Wexler 1985, among others). Van der Lely & Stollwerck (1997) conclude that this is so, because SLI children's syntactic representation is underspecified with respect to coindexation between constituents.

These results on strong pronouns seem to contrast with findings on the assignment of clitic reference in Romance SLI children. Jakubowicz, Nash, Rigaut & Gérard (1998) report the results of a sentence-picture matching task on 13 French-speaking SLI children, aged between 5;7 to 13;0. They argue that their results indicate that comprehension of Accusative clitics in French-speaking SLI children is relatively well preserved. However, performance of their SLI group was considerably variable. Thus, in 5 of the 13 children tested, coreference errors ranged up to 50% (Jakubowicz, Nash, Rigaut & Gérard 1998: 145, figure 5), which is considerably lower than the error rate observed for the younger normal children. Thus, given the variability in the French SLI group, it is not clear whether the clitic-strong pronoun asymmetry with respect to the DPBE holds in SLI.

3. Clitics and Strong Pronouns in Adult Greek

Greek is a language with two distinct classes of pronominal elements: strong (full) pronouns (*aftos, afti, afto*) and weak (clitic) pronouns (*tos, ti, to*). Strong pronouns are stressed, whereas clitic pronouns are unstressed. Strong pronouns may act as subjects (5a), objects of a verb (5b), as well as objects of a preposition (5c). When a strong pronoun functions as the object of a verb (5b), it must be understood as

contrastive to be acceptable. A strong pronoun may also function as the object of a verb doubled by a clitic (5d). Clitic pronouns may act as direct or indirect objects of a verb (6a, 6b), but not as complements of prepositions (6c).[2] However, they may occur in the complement position of complex prepositions (Theophanopoulou-Kontou 1992), as in (6d).

(5) a. Aftos ine omorfos   (strong pronouns)
        he-*Nom* is handsome
        'He is handsome'

     b. O Yanisi ide afton*$_{i/j}$
        John saw-*3Sg* him-*Acc*
        'John saw him'

     c. O Yanisi charise to vivlio se afton*$_{i/j}$
        John gave-*3sg* the book to him-*Acc*
        'John gave the book to him'

     d. O Yanisi ton*$_{i/j}$ ide afton*$_{i/j}$
        John him-*clitic-Acc* saw-*3Sg* him-pronoun-*Acc*
        'John saw him'

(6) a. O Yanisi ton*$_{i/j}$ ide   (clitic pronouns)
        John him-*Acc* saw-*3Sg*
        'John saw him'

     b. O Yanisi tu*$_{i/j}$ to edose
        John him-*Gen* it-*Acc* gave-*3Sg*
        'John gave it to him'

     c. *To edosa se ton/tu
        it-*Acc* gave-*1Sg* to him-*Acc/Gen*
        'I gave it to him'

     d. O Yanisi kathise dipla tu*$_{i/j}$
        John stood-*3Sg* next him-*Gen*
        'John stood next to him'

Coreference with a local antecedent is excluded both in strong pronoun contexts (5b, 5c, 5d) and clitic contexts (6a, 6b, 6d). However, there are some prepositional environments that allow coreference between the strong pronoun and a local antecedent, as illustrated in (7).[3]

(7) O Yanisi agorase ena vivlio gia afton$_{i/j}$
     John bought-*3sg* a book for him-*Acc*
     'John bought a book for him'

Both pronoun types refer to first, second and third person, and are inflected for number and case. The third-person pronouns are also inflected for gender. The third-person strong pronoun is morphologically identical to the demonstrative pronoun *aftos* 'this' (Holton, Mackridge & Philippaki-Warburton 1997).

Greek pronouns seem to fit in the two-way distinction observed cross-linguistically by Cardinaletti & Starke (1994): strong and deficient pronouns. Greek clitic pronouns are deficient pronouns with respect to a range of properties. Morphologically, *tos, ti, to* is a reduced form of *aftos/i/o*, just like other deficient pronouns cross-linguistically. Distributionally, Greek strong and clitic pronouns surface in different positions (as illustrated in examples (5) and (6) above). Unlike strong pronouns, clitics cannot occur in th-positions (8) or peripheral positions (9 and 10):

(8) O Yanis ektima *tus/aftus/aftus tus fitites
     John appreciates them-*clitic*/them-*pronoun*/these students
     'John appreciates them/these students'

(9) Einai *ton/afton/ton Yani pu thavmazo   (cleft)
     is him-*clitic*/him-*pronoun*/John that admire-*1Sg*
     'It is John I admire'

(10) *Tin/aftin/ti Maria, tha tin do   (left dislocation)
     her-*clitic*/her-*pronoun*/Mary will her see-*1Sg*
     'I will see her'

Semantically, Greek clitics, like other deficient elements cross-linguistically, can be expletives and can have both human and non-human referents:

(11) To/*afto katalava oti me agapa
     it-*clitic*/it-*pronoun* realized-*1Sg* that me loves-*3Sg*
     'I realized it that he loves me'

(12) O Yanis ton skepase
     John him-*clitic-Acc* covered-*3Sg*
     'John covered him'   (*ton* = Peter/the computer)

However, unlike other strong pronouns, that have only [+human] referents, Greek strong pronoun *aftos* can have both [+human] and [-human] referents:

(13) O Yanis (ton) skepase afton
     John (it-*clitic-Acc*) covered-*3Sg* him-*pronoun-Acc*
     'John covered him'   (*afton* = Peter/the computer)

(14) O Yanis milaje gia afton oli tin ora
     John spoke about him-*pronoun-Acc* all the time
     'John spoke about him all the time'   (*afton* = Peter/the computer)

In this respect, Greek strong pronouns differ from Italian strong pronouns that have always [+human] reference, as well as from Spanish strong pronouns, which are underspecified for the feature [human] only when they constitute complements of prepositions (Baauw, Escobar & Philip 1997). However, it is not surprising that Greek strong pronouns exhibit these properties, given the fact that they have demonstrative morphology. Demonstratives may refer to non-human entities cross-linguistically. For example, English personal pronouns *they* and *them*, that have demonstrative morphology, can refer to non-human entities when coordinated (Cardinaletti & Starke 1994, p. 2, fn. 1).

4. The Experiments

4.1 Methodology

The work reported here includes three experiments on the acquisition of pronominal reference in typically-developing Greek children and one experiment with Greek SLI children.

The Truth Value Judgment task was used in all experiments (Crain & McKee 1985, Crain & Thornton 1998). This task is used to investigate the possibility that children's grammar permits them to assign to a sentence a meaning that is ruled out by a grammatical constraint (in this case, Principle B of the Binding Theory). Children are presented with meaning-utterance pairs and asked to decide if each pair is true or false. One experimenter uses toys to act out stories. Another experimenter manipulates a blind-folded puppet that listens to the stories and then describes what happened. Next, the child judges whether the puppet's answer is a correct or an incorrect description of the event and rewards the puppet accordingly. If the child informs the puppet that it said the wrong thing, the experimenter agrees and asks the child to explain what really happened in the story. This is the elicitation component of the task, which enables the experimenter to decide whether the child understands the puppet's description of the story and is rejecting it for the right reason or for some other reason.

The Truth Value Judgment task makes two alternative meanings available for each sentence on each trial. On one meaning, the sentence is an accurate description of something that happened in the story, while on the other meaning it is an inaccurate description. If the child rejects a sentence in contexts that correspond to the meaning that is ruled out by the constraint, but accepts it in contexts that correspond to meanings that are not ruled out by the constraint, these responses are taken as evidence that the constraint is part of the child's grammatical knowledge. On the other hand, if the child accepts the test sentence in inappropriate contexts, this response is taken as evidence that the child's grammar lacks the constraint (or at least that the child cannot use the constraint). A typical story used was as follows (Crain & Thornton 1998):

Experimenter: In this story, Micky, Goofy and Donald decided to sleep outside one night, so they could see the stars. It was a very cold night, and after a while, Micky and Goofy began to shiver. Micky said: "Goofy, could you cover me with that blanket?" But Goofy said: "Sorry, Micky, but this blanket is not big enough for you too. I am so cold, I will need the whole thing to keep warm. You will have to get another blanket." "Here, Micky," said Donald "you can have my blanket. I don't need it, because my feathers keep me warm. Lie down, and I will cover you." <Donald covers Micky>. Goofy said "Are you all set Micky? Good. I will lie down under my blanket, then."

<Goofy covers himself with his own blanket>.

Experimenter: OK Kermit, can you guess what happened?

Kermit: Oh! I know what happened in that story...

4.2 Experiments with Typically-Developing Children

4.2.1 Experiment I

The goal of the first experiment was to test whether children exhibit the DPBE in the following contexts: a) sentences with clitic pronouns (as in (15)), and b) sentences with strong pronouns as complements of verbs (as in (16)). In addition, four control conditions were included in the experiment, illustrated in (17) to (20) below. There were four different trials for each of the two experimental conditions. The 24 experimental items together with 12 fillers were distributed over two sessions.

Test conditions:

(15) O Goofyi ton$_{j/*i}$ skepase   (clitic)
     Goofy him covered   (adult answer '*NO*')
     'Goofy covered him'

(16) O Goofyi skepase afton$_{j/*i}$ (pronoun)
     Goofy covered him   (adult answer '*NO*')
     'Goofy covered him'

Control conditions:

(17) O Donaldi ton$_{j/*i}$ skepase   (clitic)
     Donald him covered   (adult answer '*YES*')
     'Donald covered him'

(18) O Donaldi skepase afton$_{j/*i}$ (pronoun)
     Donald covered him   (adult answer '*YES*')
     'Donald covered him'

(19) O Donaldi skepase ton eafto tu$_{i/*j}$ (reflexive)
     Donald covered himself   (adult answer '*NO*')
     'Donald covered himself'

(20) O Goofyi skepase ton eafto tui/*j   (reflexive)
    Goofy covered himself   (adult answer 'YES')
    'Goofy covered himself'

20 Greek-speaking children, aged from 3;7 to 5;6 (mean age 4;5) were examined in this experiment. The results are summarized on Tables 1 and 2.

Table 1. *Proportion of correct responses on test conditions for Experiment I*

Type	Correct ('No')
Clitics	76/80 (95%)
Strong Pronouns	70/80 (87%)

Table 2. *Proportion of correct responses on control conditions for Experiment I*

Type	Correct
Clitics	76/80 (95%)
Strong Pronouns	74/80 (93%)
Reflexives	139/160 (87%)

Greek children's performance on test sentences was adult-like for both clitics (with correct responses in 95% of the cases) and strong pronouns (with correct responses in 87% of the cases). Furthermore, the accuracy of children's responses to control items was 95% for clitic pronouns, 93% for strong pronouns, and 87% for reflexive pronouns.[4]

4.2.2 Experiment II

The goal of the second experiment was to test whether there is any DPBE in two additional contexts: a) strong pronouns doubled by clitics (as in (21)), and b) strong pronouns in prepositional contexts that do not permit coreference (as in (22)), as well as prepositional contexts that do permit coreference (as in (23)). The same procedure and materials were used, as in Experiment I. There were two different trials for test conditions (21) and (22), and one trial for test condition (23). Two control conditions (24 and 25) were also included in the experiment. The nine experimental conditions together with five fillers were distributed over two sessions.

Test conditions:

(21) O Goofyi ton $_{j/*i}$ skepase afton$_{j/*i}$ (adult response 'NO')
    Goofy him-*clitic* covered him-*pronoun*
    'Goofy covered him'

(22) O Goofyi agorase se afton$_{j/*i}$ ena vivlio   (adult response 'NO')
    Goofy bought to him-*pronoun* a book
    'Goofy bought him a book'

(23) O Goofyi agorase gia afton$_{j/i}$ ena vivlio   (ambiguous)
    Goofy bought for him-*pronoun* a book
    'Goofy bought a book for him'

Control conditions:

(24) O Goofyi ton$_{j/*i}$ skepase afton$_{j/*i}$ (adult response 'YES')
    Goofy him-clitic covered him-*pronoun*
    'Goofy covered him'

(25) O Goofyi agorase se afton$_{j/*i}$ ena vivlio   (adult response 'YES')
    Goofy bought to him-*pronoun* a book
    'Goofy bought him a book'

20 Greek-speaking children, aged from 3;10 to 5;9 (mean age 4;6) were examined in this experiment. The results of the experiment are summarized in Tables 3 to 5.

Table 3. *Proportion of correct responses for test conditions (21) and (22) for Experiment II*

Type	Correct ('No')
Doubled Pronoun	38/40 (95%)
P non-coreference	38/40 (95%)

Table 4. *Proportion of coreference vs. non-coreference responses for test condition (23) for Experiment II*

Type	Coreference	Non-coreference
P coreference	14/20 (70%)	6/20 (30%)

Table 5. *Proportion of correct responses for control conditions (24) and (25) for Experiment II*

Type	Correct ('Yes')
Doubled Pronoun	39/40 (98%)
P non-coreference	38/40 (95%)

The accuracy of children's responses to test items was adult-like, with correct responses 95% of the time in both doubled pronoun contexts and contexts with strong pronouns as complements of prepositions. Interestingly, although children consistently rejected coreference for test condition (22), they did accept coreference 70% of the time for test condition (23), where coreference is permitted in the adult language. The accuracy of children's responses to control items was 98% for doubled pronoun contexts and 95% for non-coreference prepositional contexts.[5]

Given the sharp contrast between (22) and (23) in child Greek, we decided to test a control group of 20 Greek-speaking adults, to check their assignments of pronominal reference in prepositional constructions. The results are summarized on Table 6.

Table 6. Proportion of coreference responses in prepositional contexts for the adult control group

se afton (P-non-coreference)	gia afton (P-coreference)
0/20 (0%) coreference	19/20 (95%) coreference

Our results indicate that although Greek adults never allow a coreferential interpretation in sentences like (22), they do so 95% of the time in sentences like (23). Of the 20 adults tested, only one did not permit a coreferential interpretation in prepositional contexts like (23).

4.2.3 Experiment III

The goal of Experiment III was to test whether there is any DPBE in structures that are more complex than the ones tested in experiment I. It has been reported in the literature that there is one environment where the DPBE is evident even in Romance-learning children, namely in Complex Predicate Constructions (CPCs) (Baauw, Escobar & Philip 1997, Hamann, Kowalski & Philip 1997):

(26) La niña la ve bailar
    the girl her-*clitic* sees dance-*infinitive*
    'The girl sees her dance'

(27) La fille la voit dancer
    the girl her-*clitic* sees dance-*infinitive*
    'The girl sees her dance'

Constructions like (26) and (27) in Romance involve an infinitival form. Modern Greek does not have infinitives (Joseph 1983). In places where other languages use an infinitive, Modern Greek makes use of a verb form introduced by the particle *na* and inflected for subject-verb agreement, as illustrated in (28) (Iatridou 1988, Varlokosta & Hornstein 1993, among others). Modern Greek has also a Secondary Predicate Construction (SPC), involving a passive participle inflected for gender, number and case, but not person agreement, as shown in (29).

(28) Vlepo ton Yani na thimoni
    see-1Sg John-Acc particle get-angry-3Sg-imperfective
    'I see John getting angry'

(29) Vlepo ton Yani thimomeno
    See-1Sg John-Acc angry-passive participle-Masc-Acc-Sg
    'I see John angry'

These two constructions constituted the test conditions for Experiment III. Each construction was tested both in clitic ((30) and (31)) and strong pronoun contexts ((32) and (33)). Four control conditions, equivalent to the four test conditions but with an adult-like 'yes' response, were also included in the experiment. There were two different trials for each experimental condition. The 16 experimental items together with eight fillers were distributed over two sessions.

Test conditions:

(30) O Goofyi ton$_{j/*i}$ ide na chorevi   (adult response '*NO*')
    Goofy him-clitic saw particle dance-3sg-imperfective
    'Goofy saw him dance'

(31) O Goofyi ton$_{j/*i}$ ide demeno   (adult response '*NO*')
    Goofy him-clitic saw tied-passive participle-Acc-Masc-Sg
    'Goofy saw him tied up'

(32) O Goofyi ide afton$_{j/*i}$ na chorevi   (adult response '*NO*')
    Goofy saw him-pronoun particle dance-3sg-imperfective
    'Goofy saw him dance'

(33) O Goofyi ide afton$_{j/*i}$ demeno   (adult response '*NO*')
    Goofy saw him-pronoun tied-passive participle-Acc-Masc-Sg
    'Goofy saw him tied up'

20 Greek-speaking children, aged from 3;6 to 5;10 (mean age 4;6) were examined in this experiment. The results of the experiment are summarized on Tables 7 and 8 below.

Table 7. Proportion of correct responses in test conditions Experiment III

Type	Correct ('No')
SPC-clitic	16/40 (40%)
SPC-pronoun	20/40 (50%)
na-clause-clitic	35/40 (88%)
na-clause-pronoun	33/40 (83%)

The accuracy of children's responses to SPC was not adult-like, with incorrect responses 60% of the time in the clitic contexts and 50% of the time in the pronoun contexts. In contrast, the accuracy of children's responses to na-clauses was adult-like with correct responses 88% of the time for the clitic context and 83% of the time for the pronoun context (Table 7).

The accuracy of children's responses to control conditions with an adult-like 'yes' response was adult-like (Table 8).[6]

Table 8. *Proportion of correct responses on control conditions Experiment III*

Type	Correct ('Yes')
SPC-clitic	38/40 (95%)
SPC-pronoun	36/40 (90%)
na-clause-clitic	38/40 (95%)
na-clause-pronoun	37/40 (93%)

4.3 The SLI Experiment

The goal of this experiment was to test Greek SLI children's knowledge of pro-nominal interpretation in all contexts tested in Experiments I to III. There were seven test conditions: simple clitic context, simple pronoun context, doubled pronoun context, prepositional-non-coreference context, prepositional-coreference context, SPC-clitic context and na-clause-clitic context. There was one trial for each test condition. The experiment included also five fillers, three false and two true.

Five Greek-speaking SLI children participated in this experiment, aged 4;7 (Alexia), 5;4 (Yiota), 5;10 (Ioana), 6;5 (Yiorgos), and 8;1 (Agni).[7] However, one of the children, Yiorgos, was excluded from the final calculation because his responses to fillers indicated that he was not paying any attention to the stories: the accuracy of his responses to filler items was only 20%. The remaining four children gave correct responses to fillers 96% of the time, accepting true fillers 100% of the time and rejecting false fillers 92% of the time. Our findings are summarized in Tables 9 and 10.

Table 9. *Proportion of correct responses on test conditions for the 4 Greek SLI children*

Type	Correct
Clitic	2/4 (50%)
Strong Pronoun	2/4 (50%)
Doubled pronoun	2/4 (50%)
P non-coreference	3/4 (75%)
P coreference	3/4 (75%) Coreference 1/4 (25%)Non-coreference
SPC-clitic	0/4 (0%)
na-clause-clitic	4/4 (100%)

Our findings indicate that the four Greek SLI children split into two groups. One group appears to pattern similarly to Greek typically-developing children: they

do not show any DPBE except in SPCs. The other group appears to have a DPBE in all contexts but na-clauses.

Table 10. *Number of correct responses for each SLI child*

Type	Alexia	Ioana	Yiota	Agni
Clitic	0/1	0/1	1/1	1/1
Pronoun	0/1	0/1	1/1	1/1
Doubled pronoun	0/1	0/1	1/1	1/1
P non-coreference	0/1	1/1	1/1	1/1
P coreference	coref.	coref.	non-coref.	coref.
SPC-clitic	0/1	0/1	0/1	0/1
Na-clause-clitic	1/1	1/1	1/1	1/1

5. Discussion

The results of experiment I provide conclusive evidence that the DPBE is not effective in child Greek clitic contexts. Greek children responded correctly to sentences with clitics 95% of the time, indicating their knowledge of the binding requirements of pronominal clitics. Thus, our results replicate the Romance results on clitics (McKee 1992, for Italian; Padilla 1990 and Baauw, Escobar & Philip 1997, for Spanish; Hamann, Kowalski & Philip 1997, for French).

Moreover, the DPBE appears to be absent in strong pronoun contexts too. Greek children's performance in these contexts was again adult-like, with correct responses 87% of the time. These findings on strong pronouns are reinforced by the results of experiment II. Children responded correctly to sentences with strong pronouns doubled by clitics 95% of the time. Thus, the overall performance of Greek children in contexts with strong pronouns as complements of a verb is highly adult-like, a result that contrasts with the cross-linguistic findings on strong pronouns: languages that possess only strong pronouns (e.g. English) exhibit a clear DPBE, while languages that allow both clitics and strong pronouns (e.g. Italian) display a DPBE only in strong pronoun contexts (Baauw, Escobar & Philip 1997).[8]

Furthermore, Greek children's performance on sentences with strong pronouns in prepositional contexts appears also to be adult-like. Greek children exhibit a sharp contrast in their performance between prepositional contexts that permit coreference and those that do not: they accepted coreference 70% of the time in the former case while they rejected coreference 95% of the time in the latter case (Tables 3 and 4).[9] This sharp contrast has not been reported in child Romance: in Spanish and Catalan, children accept coreferential responses in prepositional contexts that allow coreference more often than adults do (Baauw 1999, Escobar & Cavarró 1999). However, Spanish and Catalan children have been tested only in

ambiguous prepositional contexts. Thus, it is not clear whether the high proportion of their coreference responses is a real DPBE. Modern Greek, on the hand, makes a clear distinction between the two prepositional environments (coreferential vs. non-coreferential). Thus, Greek children's performance on prepositional contexts provides compelling evidence that child Greek exhibits no DPBE altogether.

The unexpected symmetry between Greek clitics and strong pronouns with respect to the DPBE raises the question why the DPBE is absent altogether in child Greek. A structural explanation along the lines of McKee (1992) cannot account for the observed symmetry. Clitics and strong pronouns in Modern Greek occupy different positions, however, they appear to pattern similarly with respect to the DPBE. Baauw, Escobar & Philip (1997) tie the presence of the DPBE to the feature specification of pronouns. Following Delfitto & Corver (1993) and Cardinaletti & Starke (1994), they argue that Romance clitics are underspecified for the feature [human]. Therefore, clitics must be bound either in syntax or in discourse because binding provides a specification for this feature by inheriting the binder's value to the clitic. Coreference is excluded by binding, hence Rule I is not invoked in clitic contexts, and as a result, it cannot break down in child language. Strong pronouns, on the other hand, are usually positively specified for the feature human (i.e., they usually have [+human] referents), hence are subject to Rule I.[10] Recall from section 3, that Greek strong pronouns are underspecified for the feature [human], that is, strong pronouns in Modern Greek allow both human and non-human referents. Assuming that the presence of the DPBE is a result of the fact that strong pronouns are subject to coreference since they are positively specified for the feature [human], the lack of the DPBE in child Greek can be explained as a result of the underspecification of the feature [human] in Greek strong pronouns. We conjecture that the underspecification of the Greek pronoun *aftos* for the feature [human] is due to its demonstrative morphology. Recall again, that the strong pronoun *aftos* is morphologically identical with the demonstrative pronoun. It appears that demonstrative pronouns may refer to non-human entities as well (Cardinaletti & Starke 1994). If we are right in claiming that the pattern exhibited by the Greek strong pronoun *aftos* with respect to the DPBE is due to its demonstrative nature, we predict that pronouns with demonstrative morphology should not give rise to the DPBE in child language.

Our results from experiment III indicate that the DPBE is effective in SPCs: Greek children's performance was at chance level in SPCs with clitics (31) as well as strong pronouns (33). However, there was an asymmetry in children's performance between SPCs and *na*-clauses like (30) and (32): Greek children did not exhibit a DPBE in the latter case. This asymmetry cannot be attributed to the nature of pronominal elements since it appears to hold in both clitic and strong pronoun contexts. Therefore, it must be related to the different structures involved. The difference between (30/32) and (31/33) is that while the first one involves a fully-

fledged clause, the second one constitutes a small clause construction, as shown in (34) and (35) respectively:

(34) O Yanis ide [NP aftoni [CP ECi na chorevi]]

(35) O Yanis ide [ARGP aftoni [ARG [AP ECi demeno]]]

Assuming that CPCs like (26) and (27) in Spanish and French are subject to the General Condition on A-Chains (Reinhard & Reuland 1999),[11] as argued also by Baauw, Escobar & Philip (1997) and Hamann, Kowalski & Philip (1997), one could attribute the presence of the DPBE in Greek SPCs like (31/33) to A-chain violations due to children's incomplete lexical acquisition of pronoun features (Philip & Coopmans 1996, Baauw, Escobar & Philip 1997). On the other hand, if coindexation across an embedded CP does not form an A-chain (Reinhart & Reuland 1993, footnote 35, p. 695), it is expected that *na*-constructions like (30/32) should not give rise to the DPBE.[12]

Last, our findings from the four Greek SLI children tested in this study are considerably variable. One group of SLI children appears to pattern similarly to typically-developing children: they do not show any DPBE, except in SPCs. The other group appears to have a DPBE in both clitic and strong pronoun contexts. Our findings do not support Jakubowicz, Nash, Rigaut & Gérard's (1998) claim that comprehension of clitics is relatively well preserved in SLI. It appears that for some SLI children comprehension of clitics is severely impaired. Given the high proportion of coreference errors observed also in one of the French SLI groups (section 2), we can conclude that the clitic-strong pronoun asymmetry with respect to the DPBE does not hold in SLI since the interpretation of clitics is affected at least in a subgroup of SLI children.

6. Conclusion

In the present study, it was shown that Greek children's interpretations of clitic pronouns do not give rise to the DPBE, in accordance with what has been reported for Romance clitic contexts. Furthermore, it was shown that Greek strong pronoun contexts do not give rise to the DPBE either, unlike what has been reported cross-linguistically for strong pronouns. The lack of the DPBE in Greek strong pronoun contexts was attributed to the demonstrative morphology of these pronouns. Last, it was shown that the clitic-pronoun asymmetry with respect to the DPBE does not appear to hold in SLI: the interpretation of both clitics and strong pronouns was found to be severely impaired in a subgroup of Greek SLI children.

Endnotes

[1] Alternatively, Chien & Wexler (1990) propose that young children's pronominal assignment failures are due to Principle P, a pragmatic principle that regulates the interpretation of indices and prohibits coreference between two non-coindexed elements.

[2] Nominative forms of the clitic pronoun are restricted to some exclamatory and interrogative constructions (for an analysis see Joseph 1993).

[3] In fact, these are the environments that allow pronouns and reflexives in non-complementary distribution.

[4] The accuracy of children's responses to fillers for experiment I was 93%.

[5] The accuracy of children's responses to fillers for experiment II was 98%.

[6] The accuracy of children's responses to fillers for experiment III was 96%.

[7] All children were diagnosed as SLI by neurologists and speech therapists. Their IQ performance was normal. None of the children had a history of hearing, motor, neurological or emotional impairment. The first four children were receiving speech therapy at the time of this study.

[8] Baauw (1999) reports that unlike Italian, Spanish strong pronoun contexts do not exhibit a DPBE. He attributes this pattern to the fact that strong pronoun contexts in Spanish involve always clitic doubling. However, this explanation cannot hold for the Greek data, because clitic doubling is optional in Greek strong pronoun contexts (see section 3, examples 5b vs. 5d).

[9] The lower proportion of children's coreferential responses compared to adults' responses (70% vs. 95%) could be due to the fact that children are not as sensitive as adults are to the semantic/syntactic differences between various prepositions.

[10] Baauw, Escobar & Philip (1997) report that unlike Italian, Spanish strong pronouns are not always positively specified for the feature [human]. When strong pronouns are complements of a verb they refer exclusively to human referents. However, when Spanish strong pronouns are complements of a preposition, they are underspecified for the feature [human]. If the DPBE is a result of the feature specification of pronouns, then the DPBE should not be expected in Spanish Prepositional Phrase contexts because pronouns in these contexts should be subject to binding and not to coreference.

[11] *General Condition on A-chains* (Reinhart & Reuland 1993): A maximal A-chain (a1,...., an) contains exactly one link – a1 – that is both +R and Case marked.

[12] According to Varlokosta (1999), the difference observed in Greek SPCs and *na*-clauses is due to the difference in the type of empty category involved in these constructions (PRO vs. pro). However, first, it is not clear whether the two constructions involve different empty categories and, second, it is not clear how the difference in empty category would explain the observed pattern, if both PRO and pro are +R and Case marked, as argued in Reinhart & Reuland (1993).

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