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Direct Object Clitics in Greek-speaking children with Specific Language Impairment

MA thesis of

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with

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August 2007

Acknowledgments

This master would not have started, even more not be completed without the existence of Eric Reuland, my "mentor" ☺, and I want to thank him for the nice discussions and for his constant support, care and patience.

I would also like to thank Ken Wexler for the knowledge and the experience he shared with me. The nice atmosphere and the "intense" meetings! It was fun!

I would like to thank Frank Wijnen for introducing me into language disorders and Loes that made me happy by working together and keep me going!

The experiment could not have been completed without the help of Prof. S. Varlokosta, the logotherapists M. Vlasopoulou, E. Levanti and A. Fraguli and of course the wonderful children with SLI and their families that participated in the study with such an excitement. I am also grateful to Ageliki Riga and Marieta Raskou, principals of the kindergarten "Villa Emilia" that embraced me and my "experimental trials" in language acquisition those two years by providing me access to their great children and their friendly environment!

I am grateful to Marieta, Christina and Zoe for taking over the artistic task of the experiment and designed the pictures (☺) and to Alexis, Kalomira and Pepi for their help in carrying out the experiment.

I would also like to thank A. Gavvaró, A. Terzi, C.Alexaki for the data, the help and the interest in this work.

I am thankful to Kalomira, Demetri and Andi for their comments and help in editing this thesis.

And…a big thanks to everyone who was and is there for me! It's been a pleasure being around you!

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CHAPTER 1

Introduction

1.1 Grammar and the study of Language Acquisition

Learning our native language is an extremely complex task which we master extremely easily. We know what is "incorrect", what is ambiguous or what has no specific meaning in our language. And we reach the point of knowing these details so quickly and effortlessly. How does this happen?

Until the late 50s there exist, roughly speaking, two main hypotheses: 1) children *learn* by reinforcement in the Pavlov's way, associating stimulus and response ("behaviourism" – see [Skinner (1957]; and 2) children *learn* by *imitating* adults, trying to repeat what they hear and being *corrected* by adults. Hypothesis 1 cannot stand, since children, very often, produce things that they have never heard. Parents also do not seem to *reward* or *punish* their children's correct or wrong sentences in real life situations. As for Hypothesis 2, it needs a very careful and consistent "instructor" to take up on all subtle mistakes that a child might make and the same as Hypothesis 1 parents don't act likewise. Also, children do not seem to change their utterances even if they have heard it correctly by their interlocutors, rather they repeat it wrong or continue with their topic [see Guasti (2002)] Even more, for both theories, it would take way much more time, than it actually does, to receive all the paradigms and possible input along with all the generalizations and restrictions in one's language.

Because experience alone was not enough to solve the mystery of language acquisition, the generativist framework approached the issue in a different way and Chomsky introduced the *innateness* hypothesis. Humans are considered to be equipped with a device that enables them to learn language; i.e. the *Language Acquisition Device* (LAD) and a *Universal Grammar* (UG) that contains sets of principles that underlie language in a unified way and a range of parameters that are set in accordance to each different language. This suggestion attempts to explain the easy and unconscious way that children learn their native language, given that they are exposed to much less input than the output they produce (a fact known as "The

Argument of the Poverty of the Stimulus"). The idea is that this device, responsible for this uniquely human cognitive ability, is genetically endowed. One should be really careful on this point; no particular language (i.e. Spanish or Turkish) is genetically encoded to certain individuals. Rather, there are some general and more abstract rules and constraints that are genetically encoded and allow the environment to work on them and learn the corresponding native language; the same child, with the one DNA will learn Spanish if he/she grows up in a Spanish-speaking environment or Korean if he/she is brought up in Korea.

The questions that are raised then, are: i) which are the minimal set or rules or constraints that are enough for language to be learned (in a unified way) and ii) to what extent those "rules" are genetically *pre*-defined or formulated throughout development.

Adult language cannot provide us with an insight into the mechanisms involved because it is already proficient; it is in its final stage. The way those questions are addressed is through psycholinguistics and the study of language acquisition; the former being the link between language as an innate device/ mechanism and language as a behavioural manifestation in everyday life and the latter being the determination of what children do and do not know at an early stage and by which age exactly and how/if this varies cross-linguistically. The procedure is threefold: observation, theoretical explanation and biological implementation.

Not all people though master language in the same way. Genetic (genetic mutations, miswiring of brain neurons, deafness etc.) or environmental (isolation, stroke) reasons can prevent an individual from acquiring language in a *normal* or *typical* way and this results in what is called *language disorders*. Which linguistics structures are affected? How can a linguistic theory account for that across languages? What are the similarities and differences in the course of language acquisition in both typical and distorted cases?

This project sets out to contribute to our understanding of Specific Language Impairment, a disorder restricted to language with no other neurological or physiological manifestations. It specifically focuses on direct object *clitics* in Modern Greek since clitics play an important role in current debates on how the manifestation of SLI is related to particular properties of the a grammatical system.

1.2 How did this study emerge?

Following the Innateness hypothesis, some of the linguistic "rules" are innate and, moreover, some of them are subject to maturation; their status changes by biological reasons that affect only the language faculty. So, for example, such rules may "constrain" the grammar in the first stages and then in the following stages leave the grammar "free" of their effect. Relevant to this study is one of those developmental constraints, namely the *Unique Checking Constraint* (UCC).

UCC is applied to the syntax influencing different syntactic derivations across languages (inflection, clitics etc.). Of our interest are clitics, the derivation of which requires computations that are subject to UCC. What is attested, in the first stages of normal development, is that children speaking some languages (i.e. Group I: Italian, French, Catalan) show optional omission of clitics, and children speaking some other (i.e. Group II: Spanish, Romanian, Greek) show no omission at all. Obviously, the cross-linguistic variation stems from the different syntactic requirements that are needed to license clitics in those two different Groups.

Children with SLI follow the same path and go through the same developmental stages when compared to Typically Developing (TD) ones. The difference is that they do so in a "slower pace" and hence, they are subject to constraints for a longer period. In our case, they are constraint by UCC but for a prolonged period and therefore they have the same performance as the TD ones but until an older age.

The first empirical observations (for some languages) lead to the formulation of a theory (UCC) with testable predictions. For the full picture to be formed we need to systematically obtain data for the acquisition of direct object clitics. And this is why this study was needed.

Of our interest is Greek in which TD children do not omit direct object clitics. Of course, they *are* subject to the UCC, but the constraint does not overtly affect the derivation of those clitics. Given the "parallel" development of the two groups, Greek-speaking children with SLI are expected to perform similarly with TDs and that is in fact what they do; they do *not* omit clitics.

The thesis is organised as follows: In Chapter 2 I will introduce clitics in general and more precisely clitics in Greek, with their paradigm, properties and syntax along. Previous work in the acquisition of clitics in typical development will be discussed and evaluated. Then I will turn, in Chapter 3, to Specific Language Impairment and the acquisition of clitics in relation to the one of Typical Development. Moreover, alternative theories for SLI will be presented. As you will see there, there are no experimental studies in Greek-speaking SLI children. To fill in this slot, I conducted an experiment, an elicitation task similar to the one of Schaffer (1997, 2000). Its methodology and results will then be discussed in Chapter 4. In Chapter 5, further research questions about clitics particular and SLI in general will be discussed.

CHAPTER 2

Typical Language Development

2.1 Pronominal elements

Direct object clitics are unstressed pronominal elements that have a different syntactic distribution than full DPs [Koopman & Sportiche (1995) and others]. In an informal way, they are small words that are incapable of standing on their own and usually attach to a verb.

Pronominal elements, following Cardinaletti & Starke (1994), are divided into three classes[1]; strong, weak and clitics. The dissociation of the classes does not depend on the position of the pronoun since both subject pronouns (such as *I/you/he/she/we/you/they* in English) and object pronouns (such as *ons* "us" in Dutch) can be strong or weak (impersonal subject *es* in German and object *it* in English) or clitics (subject *ie* in "dan komt*ie* niet" 'then comes he not' colloquial in Dutch or object clitics in Romance). The relation among pronouns is derived in accordance to the set of their properties and is: $\text{clitics}_D \subset \text{weak}_D \subset \text{strong}_S$. This also denotes the deficiency of the elements in each class, with clitics being the most deficient ones [Cardinaletti & Starke (1994)].

The main difference between strong and deficient forms (the latter being either weak or clitics) is that although the latter cannot stand unless they are syntactically associated with a prominent referential antecedent the former can. Furthermore, the classes are distinct in several aspects of language (morphology, phonology, syntax etc.). For example, only strong and weak pronouns can bear lexical stress and appear in positions of maximal/phrasal projections (clitics appear as heads). On the other hand, weak and clitic pronouns, unlike strong ones, allow prosodic and phonological *restructuring* (liaison in French, reduction of *you* into *ya* in Enlgish etc.). They also appear in a *derived* position (they are not allowed in θ-positions - the positions to

[1] Not only pronominals divide into these classes but also quantifiers, adverbs etc. but they are not relevant to this paper. For a discussion see Cardinaletti & Starke (1994).

which a predicate assigns its semantic roles - (1a)[2],[3]) or peripheral positions (1b)) and they are incompatible with *coordination* (2).

In this study, we are mainly interested in the properties and acquisition of object-clitics, which are very frequent in Romance languages. What makes them "special" is their *displacement*; the fact that although the strong pronoun would substitute a full DP (under salient discourse conditions) in its canonical position (post verbally in SVO languages), the clitic appears in *pre*-verbal position (as shown in 1 and 3). In languages that do not have clitics, pre-verbal pronouns are generally ungrammatical (4).

(1) a.Gianni [li_D/*$loro_S$ /*questi studenti] stima [*li_D/$loro_S$/questi studenti].
John [$them_D$/*$them_S$/*these students] estimates (pg.6)

b. E' [*$essa_D$/ lei_S/ Maria] che è bella. (cleft)
it is [*3.sg.F_D/ 3.sg.fm_S/ Mary] that is pretty

(2) Lei e(d) [*$essa_D$ / lei_S/ Maria] sono belle.
she and [*3sg-F_D / 3sg-F_S / Mary] is / are pretty (pg. 7)

(3) "John loves Maria" →
S V O_{FDP}

(**Greek**) a. *O Jiannis agapai aftin* (strong)
S V O_{SPr}
The John loves SPr-F-sg
"John loves her"

b. *O Jiannis tin agapai* (deficient)
S O_D V
John cl-F-sg loves
Literally: "John her loves"

[2] Examples 1 and 2 are taken from Cardinaletti & Starke (1994). The page is indicated next to each example. The index D stands for *deficient*, and the S for *strong* and W for *weak*..
[3] Throughout this paper the asterisk (*) denotes ungrammaticality and *sg*: singular; *M/F/N*: masculine/ feminine/ neuter

(**Spanish**) c. *Juan ama ella/* (strong)

John loves SPr-F-sg

"John loves her"

d. *Juan la ama* (deficient)

John cl-F-sg loves

Literally: "John her loves"

(**French**) e. *Jean aime elle* (strong)

John loves SPr-F-sg

"John loves her"

f. *Jean l' aime* (deficient)

John cl-F-sg loves

Literally: "John her loves"

(4) "John loves Maria" →

S V O_{FDP}

a. *John loves her / *John her loves*

S V O_S /* S O_S V

2.2 Object clitics

2.2.1 Paradigm of clitics in Greek

Object Clitics are widely used in Modern Greek. In adult speech, they are preferred in all cases where the object has already been mentioned as a full DP, or under salient conditions of the discourse (5), just like all pronouns.

(5) - Psaxno ta klidia
Looking for the keys
"I am looking for the keys"

- Ego *ta* exo
I them-cl have
"I have them"

Clitics have identical morphophonological form with third person definite articles, in the Genitive and Accusative case[4]. However, they differ in function, because clitics are referent-dependent to a discourse antecedent and definite articles are not.

Table 1: Paradigm of clitics and definite articles in Modern Greek

	3rd person Clitics			**Definite Articles**		
Singular	*masculine*	*feminine*	*neutral*	*Masculine*	*feminine*	*Neutral*
NOM	tos	ti	to	O	i	To
GEN	tu	tis	tu	Tu	tis	Tu
ACC	to(n)	ti(n)	to	To(n)	ti(n)	To
Plural						
NOM	ti	tes	ta	I	i	Ta
GEN	ton	ton	ton	Ton	ton	Ton
ACC	tus	tis	ta	Tus	tis	Ta

[4] Clitics are not usually used in Nominative case because MG doesn't have subject clitics. The only instances that they occur in Nominative is with the deictic *na-* (*na-tos* = DEICTIC-he= "here he is") and with the interrogative *pu-* (*pun-tos* = where-he= "where is he") [Joseph & Philippaki (1987:214)]

Clitics appear before or after the verb, depending on the verb's form. They appear pre-verbally in Indicative (6a) and Subjunctive (6b) and post-verbally in the Imperative (6c) and Gerund (6d) cases:

(6) (Diavases tin efimerida? "Did you read the newspaper?")

a. *Ti diavasa.* -verb in Indicative form
F-cl-acc read
"I read it"

b. *Thelo na ti diavaso* -verb in Subjunctive form
I want to-Subj F-cl-acc read
"I want to read it"

c. *Diavase tin esy* - verb in Imperative form
Read F-cl-acc you
"You, read it"

d. *Tha fao diavazontas tin* - verb in Gerund form
Will eat reading-Ger F-cl-acc
"I will eat (while) reading it"

2.2.2 Clitic Placement

As exemplified in 2.1 and mentioned in the previous section clitics in the Indicative and the Subjunctive appear before the verb, yielding an S-O-V order instead of an S-V-O, which is the "normal" word order in MG. Although they, thematically, represent to the internal argument of the verb they, morphologically, appear attached to and before it (7). Surfacing in a different position than the one that they are thematically related is a fundamental property of clitics which should be explained by any theory that tries to capture their syntax This *displacement* of the clitic is a property that holds for all clitics in general.

(7) (**Greek/Spanish**) a. *Troo ti fraula/ Como la frotilla* (Full DP)
Eat-1sg the-F-sg strawberry-acc
"I eat the strawberry"

b. *Tin troo/ La como* (clitic- SOV)
O_{cl} V / O_{cl} V
cl-F-sg eat-1sg
Literally: "(I) it eat"

c. **troo tin*[5]*/*Como la* (clitic- *SVO)
*V O_{cl}/ V O_{cl}
eat-1sg cl-F-sg-acc
"(I) eat it"

2.2.3 Clitic doubling

Another property of clitics, which is limited to a subset of clitic languages, MG to be one of them, is *clitic doubling* where both the clitic and the DP for which it stands can appear in the sentence (8). This is also the case for River Plate Spanish[6] (9), Romanian, Hebrew [Aoun (1981), Borer (1984) among others], but not for French (10) [Sportiche (1995) among others], or Italian and it is optional for Catalan.

(8) **Greek** a. *O Kostas vrike <u>to vivlio</u>* (Full DP)
The Kostas found the book
"Kostas found the book"

b. *O Kostas <u>to</u> vrike* (Clitic)
The Kostas it-cli-N-pl found-3sg
"Kostas found it"

[5] This structure can be grammatical even in Indicative and Subjunctive in Cretan or Cypriotic Greek, dialects of Modern Greek. However, my scope and analysis is on Standard MG.
[6] But not for Continental or Mexican-Spanish.

c. *O Kostas to vrike to vivlio* (Clitic Doubling)
The Kostas it-cl-N-pl found-3sg the book
"Kostas found the book"

(9) **R.P. Spanish** a. *Vimos a Juan* (Full DP)
Saw-1pl Juan
"We saw Juan"

b. *Lo vimos* (Clitic)
Him-cl saw-1pl Juan
"We saw Juan"

c. *Lo vimos a Juan* (Clitic Doubling)
Him-cl saw-1pl Juan
"We saw Juan"

(10) **French** a. *Il a trouvé le livre* (Full DP)
He has found the-M-sg book
"He has found the book"

b. *Il l' a trouvé* (Clitic)
He cl-M-Sing has found
"He has found it"

c. **Il l' a trouvé le livre*[7] (Clitic Doubling)
He cl-M-Sing has found the book
"He has found it"

2.2.4 Participial Agreement

Participial agreement refers to whether the auxiliary and the past participle agree with the object. French, Italian and Catalan are languages in which the participle agrees

[7] It is ungrammatical when no extra intonational phrase (dislocation intonation, pause etc) is imposed.

with the clitic in gender and number, and that is morphologically marked (see (11) for French).

(11) **French**

Different Gender

a. *Il a trouvé le livre* *-Il l' a trouvé*
He has found the-M-Sing book He cl-M-Sing has found
"He has found the book" "He has found it"

b. *Il a trouvé la porte* *-Il l'a trouvée (*trouvé_)*
He has found the-F-Sing door He cl-F-Sing has found
"He has found the door" "He has found it"

Different number

c. *Il a trouvé le livre* *-Il l' a trouvé*
He has found the-M-Sing book He cl-M-Sing has found
"He has found the book" "He has found it"

d. *Il a trouvé les livres* *-Il les a trouvés (*trouvé_)*
He has found the-M-Sg books He cl-M-Pl has found
"He has found the books" "He has found them"

On the other hand, Greek does not show participial agreement; i.e. the form of the participle is fixed and it doesn't "change" in order to agree with the object-clitic in gender (12a-b), number (12c-d) or case, in any tense. This is a property found in Spanish as well (13) and it is illustrated in the examples below:

(12) **Greek**

Different Genders

a. *Eho diavasi ton kanona / tin efimerida/ to vivlio*
Have read the-M-acc rule/ the-F-acc newspaper/ the-N-acc book
"I have read the rule/ newspaper/ book"

b. *Ton/Tin/To eho diavasi*

He/She/It-cl-acc have read

"I have read it"

Different Number

c. *Eho diavasi tus kanones / tis efimerides/ ta vivlia*

Reading the-M-Pl acc rule/ the-F-Pl-acc newspaper/ the-N-Pl-acc book

"I have read the rules/ newspapers/ books"

d. *Tus/Tis/Ta eho diavasei*

He/She/It-cl-acc have-1sg read

"I have read it

(13) **Spanish**

Different Gender

a. *El ha encontrado el libro*	*-El le ha encontrado*
He has found the-M-Sing book	He cl-M-Sing has found
"He has found the book"	"He has found it"
b. *El ha encontrado la llave*	*-El la ha encontrado/*encontrada*
He has found the-F-Sing key	He cl-F-Sing has found
"He has found the keys"	"He has found it"

Different number

c. *El ha encontrado la llave*	*-El la ha encontrado*
He has found the-F-Sing key	He cl-F-Sing has found
"He has found the key"	"He has found them"
d. *El ha encontrado las llaves*	*-El las ha encontrado/*encontradas*
He has found the-F-Sing key	He cl-F-Pl has found
"He has found the keys"	"He has found it"

2.3 Syntax of clitics

A theory for the syntax of clitics is needed, which answers:

i. Where is the clitic generated? (In-situ, or is movement involved, or both?)
ii. How is clitic doubling derived and explained? (the clitic and the DP have the same theta-role and case)

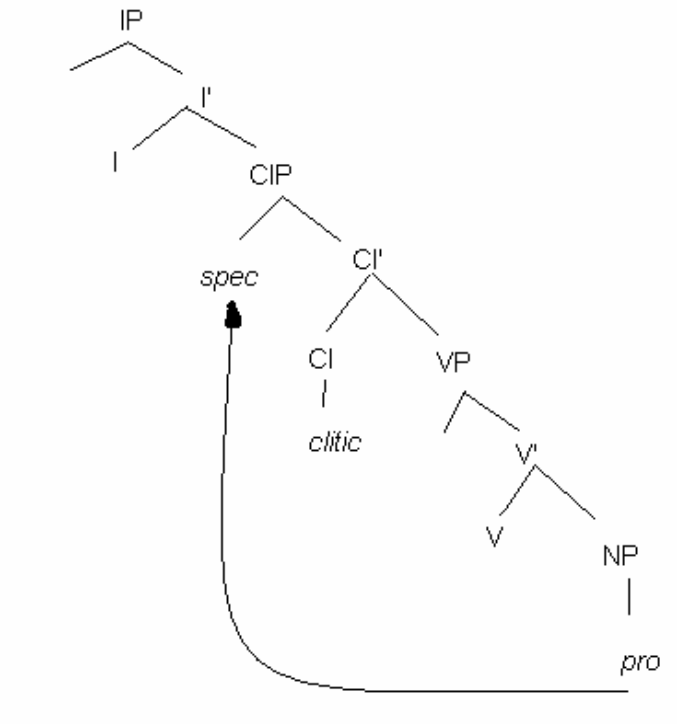
For (i) there are two broad categories: the *base-generation* [see Borer (1986) for a detailed survey], and the *movement* analyses [Kayne (1975/ 1991)].

Movement approaches [Kayne (1975) and Philippaki-Warburton (1977)] suggest that the clitic is merged in the internal argument position of V and then moves to its surface one, leaving a trace in its source position. This model was motivated by the fact that, in Italian and French, clitics and their full DPs are in a complementary distribution. However, this theory cannot capture the phenomenon of clitic doubling, found in Greek, some Spanish dialects, Romanian etc.; namely, that the clitic *and* the corresponding full object can appear in the sentence (as described in 2.1.3)

The aforementioned weakness of the movement theory led to the formulation of the base-generation hypothesis [Jaeggli (1982); Borer (1984)], according to which, clitics are generated in their surface position, pre-verbally, and their argument position is filled by a *pro*. In cases of clitic doubling, the full DP occupies this argument position.

Uriagereka (1995) and Sportiche (1996), proposed analyses that combine the two previously mentioned approached; their analyses consist of both base-generation *and* movement.
Uriagereka (1995), based on the similarity between 3rd person pronouns and determiners in Romance, proposes that clitics are not arguments but functional parts of an argument; clitic is the head of a DP projection which is complement of the verb and undergoes movement to the functional domain of the clause. The doubled DP, if present, appears in the Spec-DP and the clitic moves to the head of a higher projection (i.e. FP, which function as revealing the "a speaker's or an embedded subject's point of view" [Uriagereka (1995: 93], in order to license its complement *pro*.

On the other hand, Sportiche (1992/1996), based on the blocking effects of intervening subjects on clitic placement, past participle agreement etc., proposes that clitics are base-generated, in a pre-existing slot heading their *own* projection, ClP. In the internal argument position of the verb there is a null XP, *pro*, which moves to the Specifier position of ClP and agrees in the features number, gender, person, case with the clitic via Spec-Head agreement. In non-clitic doubling languages the head movement of the *pro* is covert. In clitic doubling languages, movement is overt and the double DP, when/if present, occupies the internal argument position and agreement is established again by Spec-Head relation.



There are also more recent proposals concerning clitic doubling which are based either on Sportiche's framework [Anagnostopoulou (1999)], or in Uriagereka's [Papangeli (2000)]. This study is focused in language acquisition and not on the evaluation of the various syntactic theories. Our analysis of clitic acquisition does not change with the different analyses; therefore we will follow Sportiche (1995), without any further objection to the other similar proposals

2.4 Cross-linguistic Acquisition of clitics

As mentioned in the introduction, when one wants to study the stage-to-stage procedure of how language is acquired and mastered, then examining the adults' language use and manipulation does not help much. Adults have already reached the proficient level of their language (actually by the age of 6;0) and so there is no insight in how this level was achieved. In order to have this insight in the language faculty and its mechanisms one must carefully observe young children's language. There, it is possible to see differences in performance among structures and grammatical elements and also among languages, which allow for speculations regarding the mechanisms needed both in terms of difficulty but also in terms of cross-linguistic uniformity. In this study we are interested in how *clitics* are acquired and what is the picture formed across languages. Having described the properties of clitics and having adopted a syntactic framework which explains their derivation I can now move forward to consider the acquisitional status of clitics.

To assess whether a clitic is acquired and therefore produced or omitted, one has to examine the context of the utterance, and also the Mean Length Utterance (MLU) of the child. The context should be such as to favour the use of the clitic instead of the DP, because clitics are referential elements, so if their referent is lacking or is not dominant, then they are neither felicitous and nor obligatory respectively.

On the other hand, the MLU has to be bigger than 2 for a clitic to be produced because clitics cannot stand alone and therefore 1-word utterances cannot be informative. Experimental data also support this prerequisite; Babyonyshev & Marin (2006) examined clitic production (in Romanian) in groups that they defined according to their MLU or to the age and they concluded that the omissions shown in very young children are not due to a constraint or a grammatical inability rather due to the "inability of very young children to produce utterances of the length required by the clitic constructions" [Babyonyshev& Marin (2006): pg. 39]. Previous studies revealed different patterns in the acquisition of clitics by young children. The difference is seen both in the age of the first use of clitics and in the age of mastering them in an adult way and is consistent in a way that permits the formulation of 2 Groups with the following properties (14):

(14) Group I: Children speaking French, Italian and Catalan show:

- Late emergence of object clitics in studies of spontaneous speech
- high omission of clitics in obligatory environments
- production of "inappropriate" full DPs instead of a clitic

Group II: Children speaking Spanish, Greek and Romanian show:

- early use of object clitics in studies of spontaneous speech
- low omission of clitics in obligatory environments
- rare use of full DPs instead of the clitics

However, both groups show:

- no misplacement of the clitic
- productive and correct use after first emergence of clitics

In the next two sections, I will present evidence from naturalistic and from experimental data, which illustrate this variation and then I will discuss how this is predicted and explained by certain theoretical frameworks.

2.4.1 Acquisition of clitics by Typically Developing (TD) children of languages in Group I (French, Italian, Catalan)

In this section I will present in detail the acquisition studies of children speaking languages of Group I, that reveal this late emergence of clitic in French, Italian and Catalan.

While analyzing the spontaneous speech of Augustine corpus for French [Hamman et. al (1996), Jacubowicz (1997)] found a "delay" in the production of object clitics when compared to the one of subject clitics. Very few clitics appeared until the age of 2;4 (only 2 clitics appeared) and omission rate was high. However their performance improved (resembled the adult radio of 1:4) by the age of 2;9 (Table 2- Appendix A1).

The data point to a similar direction in Italian as well. Guasti (1994) studied the spontaneous speech of 3 monolingual Italian children and found that up to the age of 2;5 children omitted clitics in an average rate of 25%. Furthermore, Schaeffer (2000),

in an elicitation task in Italian speaking children, found that children at the age of 2;0 and 3;0 produced few clitics (22%, 62% respectively). For all the results see Table 3 - Appendix A1.

As for Catalan, Wexler et al. (2002), using an experiment similar to Schaeffer's one, showed that children until the age of 3;0 omitted clitics 25% of the times (Table 4- Appendix A1).

Overall, the data converge in that before the age of 3 clitics are rarely uttered (~25%) and frequently omitted (~25%) and these percentages almost double in the next year, however it's not until the age of 4;0 that clitics are used in an adult way.

2.4.2 Acquisition of clitics by Typically Developing (TD) children of languages in Group II (Spanish, Greek, Romanian)

Let us now consider the acquisition data for languages of Group II.
Wexler et al. (2002) found that Spanish speaking children, even at the age of 2;0, perform at ceiling in clitics. More precisely, in their elicitation task children used a clitic in an obligatory environment 91% of the times. This percentage raised to 98% at the age of 3;0. (Table 5- Appendix A1)

In the case of Romanian, to my knowledge, there exist two studies [Avram (1999); Babyonyshev& Marin (2006)] which present a discrepancy in their findings. Larissa Avram presents an overall omission of 42% in children aged 2;0 which becomes 25% at the age of 3;0, as revealed by her elicitation task (Table 6 – Appendix A1). This study alone would categorize Romanian to Group I unless a follow up study was conducted. Babyonyshev & Marin noticed that Avram's project "had few conditions and few tokens of each condition… the number of subjects tested was very small, e.g. 3 two year old and 7 three year old) and also that the format of the question to elicit the clitic construction was *What did X with Y*, which in [their] pilot study was shown to elicit intransitive responses…thus producing a syntactic and discourse environment in which direct object clitics are optional, rather than obligatory" [Babyonyshev & Marin (2006): pg. 29- Footnote 8]. Taken these under consideration, they designed 32 elicitation stories (8 conditions * 4 tokens of each condition), with a prompt question

"*What did X do to Y"*[8], and they tested 25 monolingual Romanian speaking children. Their results lead to a different pattern of acquisition, similar to that of Spanish and Greek. Although their two year olds uttered clitics in a 38% of the time, their 3 years old performed at a level of 93% (Table 7 - Appendix A1), a percentage that is similar to Spanish and Greek and categorizes Romanian in languages of Group II. Even more, in this study the subjects are also grouped based in their MLU and the group with an MLU>2 produced clitics 86% of the times, and as they note is that MLU is a better predictor of the performance than the age.

Turning now to Greek, Tsakali & Wexler (2003), conducted an elicitation task in Greek speaking children and they found a production of clitics as high as 98,6% at the age of 2;5. Data from spontaneous speech also show an early emergence of clitics. Marinis (2000) reports a longitudinal corpus of a monolingual Greek speaking child (the Christofidou Corpus), as well as the data available in CHILDES database [McWhinney & Snow (1985)] from 4 children in the Stephany corpus, after they have an MLU>2 and they are in the age of about 2;0, there is no stage where clitics are omitted and also no misplacement of clitics is observed; clitics appear pre-verbally in the Indicative and the Subjunctive and post-verbally in the Imperative (there were no gerunds recorded).

To conclude this section, evidence from both spontaneous data analysis and experimental methods suggests that children speaking Greek, Spanish and Romanian have no problem in using clitics in an adult way by the age of around 2;0, given that they have reached an utterance level of mean length more than 2.

How this parameterization across languages is explained by the theory will be discussed in the following section.

[8] This type of prompt question is also used in Schaeffer (2000), Wexler et al. (2002), Tsakali & Wexler (2003), De la Mora (2004) and is proven to create the appropriate syntactic and discourse context for clitic elicitation

2.5 Language Acquisition explained; a maturation account

The developmental phenomenon of optional clitic omission and its cross-linguistic variation is similar to another acquisition phenomenon; i.e. the Optional Infinitive stage. I will first discuss, in brief, the OI and its underpinnings and then I will explain how this is connected to the production/omission of object clitics.

2.5.1 The Optional Infinitive (OI) Stage

In the development of their language, children go through a stage, during which they omit either Agreement (Agr) or Tense (Tns) or none of the two, hence they are producing sentences of the type (15a-c) which are "grammatical" for them, but never of the type (15d):

(15) a. He goes [+Agr, +Tns]
b. (*)Him go [-Agr, +Tns]
c. (*)He go [+Agr, -Tns]
d. (*) Him goes [-Agr, -Tns]

This has been characterized by Wexler (1996), as the Optional Infinitive (OI) stage, whose properties are roughly summarized below:

(16) OI stage properties:

- Root non-finite sentences are produced
- Finite sentences are produced in the same time period
- Nevertheless children know the grammatical properties of finiteness and non-finiteness.
- In English, children produce non-NOM subjects (12b), as well as NOM subjects (he go, he goes) (12a, c) but don't produce non-NOM subjects when agreement is present (12d).

A basic feature of the OI stage is that only speakers of non Null Subject languages (i.e. English) go through the OI stage and not the speakers of Null Subject ones (like

Spanish, Italian etc)[9]as defined in (17). The explanation for that stage comes and its "language selection" comes from a maturation account proposed in Wexler (1998), namely the Unique Checking Constraint (18) in combination with the Minimal Violations Principle (19).

(17) The Null-Subject/OI Generalization (NS/OI)

Children in a language go through an OI stage if and only if the language is not an INFL-licensed null-subject language.

(18) Unique Checking Constraint (UCC): (in OI stage)

The D-feature of a DP can only check against one functional category

The UCC is a constraint that exists in children's grammar and allows it to accept some ungrammatical structures. It goes away with development and maturation, resulting in the corresponding adult grammar. A thing that should be highlighted here is that the UCC is not seen as a child's *defective* grammar, but as a component of a more *restricted* one.

(19) Minimal Violations (MV)

Given an LF, choose a numeration whose derivation violates as few grammatical properties as possible. If two numerations are both minimal violators, either one may be chosen.

The cross-linguistic variation of the OI stage makes it relevant to the discussion of clitic production/omission. Even more, the fact that children are in the OI stage roughly at the same age that they omit clitics in some languages, led to the examination of the relevance of the two phenomena. In fact, as discussed in Wexler et al. (2002) and Tsakali & Wexler (2003), the constraint that result in the OI, namely UCC and MV, can also be responsible for the Optional Clitic (OCl) in languages of

[9] *-0I languages*: All Germanic languages studied to date, including Danish, Dutch, English, Faroese, Icelandic, Norwegian, Swedish,. Also Irish, Russian, Brazilian, Portuguese, Czech...(any idea why Chech, which is full pro-drop,unlike Russian?)

-Non-0I languages: Italian, Spanish, Catalan, Tamil, Polish, Greek. (for references see Wexler (1998))

Group I. Following the way that the variation in OI stems from whether a language is a Null Subject language or not, the variation in the OCl stage depends on whether a language has participial agreement or not. The way all these work will be presented in the following chapter.

2.5.2 The Optional Clitic (OCl) Stage

Let's first sum up what it's been discussed until now about clitic acquisition (20).

(20) Facts about the acquisition of clitics in both Groups (I & II):

- Children do not show clitic misplacement, even in their early production
- Omission of object clitics in obligatory environments (driven mostly by discourse) is parameterized across languages and depends on whether the language has participial agreement or not; in the former case there is an optional clitic omission, in the latter there is not.
- Omission of clitics, coincides, from an age point of view, with the OI stage

Recall the syntactic derivation of clitic constructions as proposed by Sportiche (1996) and repeated here in (21)

(21) i. base-generated structure:

$[_{ClP}$ [*clitic*] $[_{AgrOP}$ [AgrO] $[_{VP}$ V $[_{DP}$ *pro*]]]]

ii. surface structure of a language with participial agreement

$[_{ClP}$ pro_i [*clitic*] $[_{AgrOP}$ t_i [AgrO] $[_{VP}$ V $[_{DP}$ t_i]]]]

iii. surface structure of a language without participial agreement

$[_{ClP}$ pro_i [*clitic*] $[_{AgrOP}$ [AgrO] $[_{VP}$ V $[_{DP}$ t_i]]]]

In languages that have participial agreement the *pro* has to move through the Spec-AgrOP before moving to ClP and must check its D-features against two functional projections (AgrO and Cl), hence leading to violation of UCC whereas in languages

that lack participial agreement only one D-feature has to be checked (Cl) and the utterance converges.

At the developmental phase during which children's grammar deviates from the adult one as a result of the UCC the utterances produced will either contain a caseless *pro*, because they will not check against AgrOP and the derivation will crash, or they will lack the clitic, because they can't check against the ClP. In the latter case the child will either produce an ungrammatical sentence or he/she will call up to a compensation strategy, i.e. they will produce a sentence with a full DP as an object, a choice which is not ungrammatical, but it will not be also the appropriate one in the given discourse and contextual conditions.

Hence, the properties that we know so far about the languages in both groups are summarized in (22):

(22) Properties of languages:

Group I (French/Italian/Catalan):

- Participial agreement; Participle agrees in gender and number with the object-clitic
- Clitic has to check two D-feature
- No optional infinitive (OI) stage
- Optional clitic (OCl) omission stage

Group II (Greek/ Spanish/ Romanian):

- No participial agreement with the object clitic in gender or number
- Clitic has to check only one D-feature
- No Optional Infinitive (OI) stage
- No Optional Clitic (OCl) stage

Having presented the evidence concerning the acquisition of clitics in Typical Development and the theory that accounts for all of them, I will now turn to the main focus of this paper which is the acquisition of clitics in children with SLI and more precisely that of Greek speaking children with SLI.

CHAPTER 3

Specific Language Impairment and Language Acquisition

3.1 What is Specific Language Impairment (SLI)?

"Specific Language Impairment is a disorder expressed as delay or malfunction or both, of Language Acquisition that is not associated with other disorders such as mental retardation, hearing problems, autism, sensorimotor or other neurological or psychological disorders" [Woods (1985)]. Hence, in earlier times, SLI was used to describe all manifestations of "delayed" and/or "deviant" language, resulting in a very wide and unidentified disorder. Its aetiology is still unknown although it is suggested, and supported by evidence, that the familial aggregation of the disorder that has been attested, is due to genetic and not to environmental factors [Tomblin (1989)].

Children with SLI mainly have difficulties in the acquisition of grammar, and they demonstrate it with problems either in the production of certain morphophonological features (like inflection) or in the comprehension of certain syntactic constructions (theta-role assignment, anaphoric dependencies), or even problems with the lexicon (poor vocabulary); apparently it is a greatly heterogeneous disorder.
Specific language impairment has attracted the attention of many researchers who are trying to better define what SLI is and also find a clinical marker for its characterization across languages. The main questions are i)how *specific* to language this disorder is ii) which constructions are affected in each language and of course, iii) how to develop a theory that can explain those deviations.

The answer to question (ii) comes mainly from naturalistic data which then lead to controlled experiments and following those, the theories are either strengthened or falsified. Then, theories are suggested and question (iii) is addressed. Apparently there is an exchange between (ii) and (iii); data provoke theoretical suggestions and then, in return, they challenge or validate them.

As for Question (i), it refers to whether SLI is a disorder that affects only language and has nothing to do with other general cognitive abilities. A lot of researchers claim that SLI occurs as a result of general cognitive limitations [Leonard (1998); Elman et al. (1990) among others]. On the other hand, evidence points to the fact that SLI is restricted to grammar and independent of the other systems.[10]

Impairment in grammar in SLI is manifested with various ways cross-linguistically. English-speaking children demonstrate continuous difficulty with inflection, in such a wide range that it is now consider a clinical marker, i.e. an identification characteristic of E(nglish)-SLI(Rice e& Wexler 1996). To the contrary, this is not the case for Italian [Leonard and Bertolini (1998)], or French where SLI children seem to have more trouble with clitics [Paradis & Cargo (2001)]. To address the issue of specificity, Van der Lely and her colleagues [Van der Lely et al. (1998)] examined a child with SLI in three distinguished domains: grammatical abilities, non-grammatical language abilities and non-verbal cognitive abilities. His performance (around 50%) was much lower than the MLU- and Age- matched group in the grammatical tasks (tense marking, pronominal reference etc.), but he scored like his age- and language-peers (even above sometimes) in all the other tasks that didn't include grammatical knowledge (logical inference, verbal logical reasoning, etc.), suggesting a *language-specific* disorder. Van der Lely and her colleagues also proceeded further, and attempted to define a homogeneous sub-group of SLI, and they used the term "G(rammatical)-SLI" to characterize children with SLI that have a primary deficit in the computational system [Van der Lely et. al (1998)].

Tsimpli & Stavrakaki's (1998), study of a monolingual Greek-speaking child revealed similar patterns and an affected morphosyntactic domain, that also lead them to refer to their case study as a G-SLI .However, G-SLI is not yet a concrete and well-defined group and not all researchers agree on its criteria of inclusion.

[10] Of course, if it is specific to language, then it would entail and prove the existence of a Language Acquisition Device (LAD) in the brain, which in children SLI would be either "miswired" in the brain, or damaged in some ways, but this leads to the *innateness* debate that, for now, is far beyond the focus of my project.

3.2 Processing- and Representation- based theories for SLI

Several theories have been proposed to address the role and status of the linguistic mechanisms attributed to the child, the locus of the problem, and the predicted outcome of the deficit [Rice, 1994]. Those theories can be grouped in two wide groups, a distinction that roughly relates to the language- specific vs general cognition one; namely the representation-based theories and the processing-based ones.

Leonard's "Surface Hypothesis" [Leonard (1989)] is one of the processing-based models and suggests that SLI is characterized by limited general processing abilities... Based on the fact that non-syllabic consonants or unstressed syllables might be a perceptual "challenge" even for typically developing children that acquire their native language [Gleitman et al. (1988)] and given that children with SLI have already general processing limitation, Leonard and his colleagues suggest that those children cannot cope with the additional operations of these morphemes and that is how they result to a deviant language. To make it clearer, what Leonard suggests is that children with SLI know the grammar and the syntax, but they cannot implement it in the structure. Although this hypothesis has obtained support by some studies in Italian and Hebrew [Leonard et al. (1989); Rom & (1990)], evidence from languages such as e.g. French, cannot be accounted for in this framework. In experiments designed for these languages that included articles and clitics (that share the same morphophonology) children with SLI were delayed in the former but not in the latter [Paradis & Cargo (2001)]. Even more, it is dubious what is meant by "limited processing capacities". As Leonard and his colleagues also discuss "it is not yet clear how the demands of morphological paradigm building compare to with those of other linguistic operations in terms of the resources required, nor whether non-linguistic cognitive operations, too, can limit the resources available to the child for processing language" [Leonard et. al (1992) : 154]

On the other side there stand the representation based models, which claim that the problems appearing in SLI stem from a weakness in the computational system. Van der Lely (1998) proposed the Representational Deficit for Dependent Relationships (RDDR) which mainly states that children with SLI treat Move F(eature) as optional when for adults or unaffected children is obligatory. According to van der Lely the

"Last Resort of Move F" (in her terms) is controlled by two principles; Economy 1: movement occurs if F is in a feature-checking relationship with its target and Economy 2: if the target has unchecked features, movement *must* occur, the latter being what children SLI lack. This theory can account for the problems with tense marking, theta-role assignment, anaphoric and pronominal reference, wh-movement, but it is not compatible with current syntactic assumptions where movement does not occur unless it is triggered [Chomsky (2000)]; if it is optional it doesn't occur *at all*.

The proposal that, until now, better explains all the empirical data and is compatible with the current syntactic (generativist) framework is the Extended Optional Infinitive (EOI) stage of morphosyntax [Rice & Wexler (1995); Rice, Wexler & Cleave (1995)]. According to this model, children with SLI also reflect the Optional Infinitive in the same way as their younger peers, but for a longer period. Hence, their grammar is constrained by the Unique Checking Constraint which prevents them from checking more than one D-feature and the Minimal Violation principle which makes them choose, between the derivations, the one that has the least violations. The EOI stage does not account only for English-speaking children with SLI and their selective omission of finiteness, but also for German-speaking children [Rice et al. (1997)], for Russian speaking children [Babyonyshev et al. (2006b)]. Following EOI, SLI speakers of non-Germanic languages will exhibit an Extended Optional Clitic (EOCl) stage [Wexler (2003)]. The predictions that follow this stage are that children speaking language of Group I must check two features in their derivation of the clitic and so they optionally omit it. SLI speakers of Group II will have no such problems with object-clitics, because they will only have to check against one feature and the UCC is not violated. In fact, those predictions are born out by the already existing data, as presented and discussed in the next section but also by the results from the present study which will be discussed in Chapter 4.

3.3 Clitic acquisition in children with SLI

Children with SLI demonstrate a "lag" in the acquisition of their language; a "delayed" onset, when compared to that of the typically developing ones [Wexler & Rice (1995), Rice et al. (2005)]. As a result and as long as clitics are concerned, we expect a behaviour that will follow the developmental path of the other children, but that will be similar to the younger peers than to the ones of the same chronological age. This "parallel" development "conserves" the OCl stage, resulting in the extended OCl stage, as explained in the previous chapter and hence, preserves the cross-linguistic difference between children learning language that belongs to Group I and those who learn a language of Group II.

3.3.1 Object clitics and SLI; cross-linguistic comparison

The studies that have been conducted until now point to that direction; children speaking French and Italian show very few productions of clitics [Hamman et al. (2003), Paradis et al. (2002), Jacubowicz et. al (1998), Leonard & Bortolini (1998), Bottari et. al (1998)] whereas Spanish- [De la Mora (2004), Bedore & Leonard (2001)] and Greek- speaking children (present study) produce much more. In this section I will present the studies, as reported in the corresponding papers and in the next one (3.2.2.) I will attempt to cross-compare them.

Hamman and her colleagues (2003) studied the spontaneous speech of 11 French-speaking children with SLI that they recorded every 3 months for 2 years. They divided them in two age-groups (age at the first recording); 6 children under the age of five (3;10-5;0 years) were in the younger group and the rest 5 were in older group (5;7-7;11 years). Out of 165 obligatory contexts the younger group had about 16% complement omissions (27/165) and 18% (30/165) complement clitics. The older group, although they omitted less (around 7%), they produced clitics at a rate of 23% but they clearly preferred the full direct object than the clitic in about 70% of the times. As they conclude, "the omission and avoidance of object pronouns may thus be a genuine and persistent characteristic for French SLI" [Hamman et al. (2003): pg.157]

Paradis and Crago (2002) focused primarily on grammar transfer in bilingual French-English speaking with SLI. To do so, they also included monolingual French speaking children with and without SLI which are relevant for our discussion. The groups of our interest are 7 children with SLI (7SLI) of mean age 7;6, 7 age-matched matched normally developing children (7ND) of mean age 7;3 as well as a group of 3ND of mean age 3;3, matched in MLU with the SLI group. They collected the spontaneous speech of all groups and studied the production of object clitics. The two ND groups performed the same and almost at ceiling (~ 98%) while the SLI group used clitics only around 47% of the times. Error analysis, for the SLI group, revealed that omission rather substitution with a full DP was the main effect in 82% of the times. The researches interpreted their results to "indicate that object clitics are a vulnerable area in the acquisition of French across learner contexts" [Paradis & Crago (2002): pg.226]

Jacubowicz et al. (1998) studied 13 French-speaking SLI children, between the ages of 5;7-13;0 (mean age: 8;11) using an elicitation task. They had two types of picture booklets, one containing one-picture pages and the other three-picture pages representing non-self oriented actions[11] and the experimenter would point to a picture asking "What is X doing to Y", a question that in adult-French requires the use of a clitic. SLI children produced a correct clitic, as a group, only 25,2 % of the times, and even in individual examination their performance was as low. They also conducted a comprehension task in which children scored 80,8%, a rate that shows that they have the grammar to understand the clitic construction, but something prevents them from producing it.

In the case of Italian, only studies of natural speech are available, to my knowledge. Bottari et al (1998) analysed the spontaneous speech from 11 Italian children with SLI, of mean age 6;3, that are available in CHILDES [MacWhinney & Snow (1985)]. 7 of the children were characterized as having both receptive and expressive (R/E) difficulties and the other 4 only expressive (E). The mean omission of clitics was 41,1%, but individual variation was attested (Table 8- Appendix A2)

[11] The experiment was designed to target several construction, so it included more conditions. I will only present the ones relevant for the elicitations of object-clitics.

Another study in Italian comes from Leonard and Bortolini (1998) who studied production data of 25 Italian children with SLI, ranging from 4;0 to 7;0 years of age, and MLU from 2.10-4.89. They collected the samples of at least 100 utterances of each child while he/she interacted with the investigator. 21 of the children were eligible for the examination of object clitic production (the ones that didn't produce at least 5 obligatory environments were excluded) and their use of the clitic reached only around 42%. The rest 58% constituted omissions rather than substitutions or errors in features, an index again of the great difficulty Italian SLI have with object clitics.

In Catalan, Anna Gavarró (2007) examined the natural speech of two Catalan-speaking children with SLI (available in CHILDES) that were recorded twice, with one year interval. The analysis of the presence/absence of object clitics gave rise to a percentage as low as 66,6% while their MLU is already over 2 (Table 9 – Appendix A2).

In Spanish, the picture slightly changes, although the available data are limited. Bedore and Leonard (2001) studied 15 Mexican-Spanish speaking children in San Diego, California that were assessed to have "minimal" opportunity to learn English[12]. Their age ranged from 3;11 to 5;6 years and their average MLU was 2.88. The experiment was a structured elicitation task in which the participants were asked to name pictures, complete sentences or describe ongoing events and clitics were elicited by a two-picture sequence in which the experimenter described the first (in order to set the context) and the child completed the sentence; i.e. "the child is washing the car and then ([they]) it-clitic push". The performance of the SLI group was significantly lower than the one of MLU which was again lower that the AGE matched group. However, as it will be discussed in the next section, there is some scepticism on the reliability of the results.

De la Mora (2004), collected spontaneous speech during "toy-playing" and also conducted an elicitation task in 10 Mexican-Spanish children with SLI (and two corresponding MLU and AGE matched groups) from Mexico, DF, aging from 4;3-6;2 years and with MLU from 1.8- 3.6. The total accuracy in the production of clitics

[12] See next section for a discussion of how "monolinguals" these children could be

is, as mentioned in the study, as low as 45% but the calculation of errors included not only omission but also substitutions in gender and number. Clitics, however, were omitted only 8%-9% of the times (Table 10- Appendix A2), a percentage much lower than the omission rate in the previously presented languages.

In Greek, until the existing study, there existed only analysis of the spontaneous speech of monolingual children. One of them is the case study of Lefteris [Varlokosta (2000), (2002)], a child diagnosed as SLI at the age of 3;3. The corpus was collected within a year and while Lefteris was in speech therapy and the data are presented in 5 phases (Table 11- Appendix A2). Until the third phase, Lefteris didn't produce any clitics at all, but as soon as they appeared in his speech, at the age of 4;1, he used them productively showing no real problems.

More recently, Alexaki, Driva & Terzi collected the spontaneous speech of 10 Greek speaking children with SLI, 5 boys and 5 girls of an age range from 3;7 to 7;4 (The Archimedes corpus)[13]. Their speech was not rich in establishing the type of context that calls for a clitic, however, the omission rate, in the resultant ones, is extremely low. More precisely, one child omitted a clitic once out of 7 environments (omission rate ~14%) and another one 2 times out of 14 contexts. All the other children used a clitic in all the corresponding cases, showing no omission, substitution or other preference, suggesting that clitics do not constitute a problematic element for Greek-speaking children with SLI.

3.3.2 Cross-linguistic comparison revisited

When going through these studies in order to render a direct comparison, one is faced with some problems. To begin with, the procedures by which the data are obtained are very different in nature. Some of them are analyses of spontaneous speech, where it is difficult to identify whether what is omitted is a clitic or an object or even whether the context strongly favours the use of a clitic and the data may be ambiguous on what the expected answer should be in the particular context, which doesn't happen in an experimental condition where you manipulate the behaviour. However, they do give a sense of child language and that is why we consider them. On the other hand,

[13] I would like to thank A. Terzi and C. Alexaki for providing me with those data and for kindly helping me with any occurred issue.

experimental set ups may bias children's responses or create carry over effects. Also, the task, the ages, and the contexts vary in a way that the results cannot be considered uniform.

These are general problems with obtaining behavioural data, but because, in clitic acquisition, there are a wide number of well done and organised studies and the results are conclusive, I will not be dwelling on which method is better, as it's not the focus of this project.

In an attempt to norm the studies and their data and make clear what we know about children with SLI and their knowledge of object clitics we came up with the Table 13 below:

Table 13: Studies in children with SLI for the acquisition of object clitics

Cross-linguistically

Language	*Study*	*#*	*age*	*task*	*om*	*prod*	*F- DPs*
French 1	Hamman et al(2003)	11	~5;5	SP	11,3%	20,9%	67,8%
French 2	Paradis & Crago (2002)	10	7;6	SP	N/A	47%	N/A
French 3	Jacubowicz et. al (1998)	13	8;11	EL	25,7%	25,2%	32,7%
Italian 1	Leonard & Bortolini (1998)	22	~5;5	SP	~53%	~42%	~5%
Italian 2	Bottari et. al (1998)	11	6;3	SP	31%	69%	N/A
Mex-Spanish 1	De la Mora (2004)	10	5;3	EL	8%	63%	28,6%
Mex-Spanish 2	Bedore & Leonard (2001)	15	~4	EL	11,5%	88,5%	N/A
Greek 1	Varlokosta (2000), (2002)	1	4,3	SP	6%	94%	N/A
Greek 2	Terzi	10	5;3	SP	3%	97%	0%

Note: (#: number of participants; SP: spontaneous speech; EL: elicitation task; OM: clitic omission; PROD: clitic production; F-DPs: Full DPs)

Before any discussion of the table, one thing that should be made clear is that Table 13 contains clitic production independent of errors in gender or number. This is why some of the percentages in the table may seem different than the ones presented in the specific articles. For example, when presenting their results, Bedore& Leonard (2001) give a percentage of 38,93% (pg: 912) of clitic use in obligatory contexts, whereas the one shown in our Table 13 is 88,5% (Mex-Spanish 2). The latter percentage accrued by counting all types of clitics taken from their Table 6 [Bedore& Leonard (2001); pg:

915]. In any way, this does not belie their results but helps us make a better comparison and draw more accurate conclusions. In their conclusion is that the performance of children with SLI may be lower that the MLU-matched controls, but not in a significant degree.

Table 13 primarily demonstrates the very low omission of clitics in Spanish and a relatively high one in Italian and French. In the results of French the results may appear slightly inconsistent (47% in Paradis versus a mean of ~22% in Hamman et.al and in Jacubowicz et al.) but this can be attributed to the difference of the method (SP vs. EL). In any way, both percentages of production are pretty low for the age under investigation, indicating a clear difficulty or avoidance of French children to use clitics.

On the other hand, the things that should be discussed for the Spanish data, are: the *within*-language difference (63% versus 88,5% in production) and the *between*-language group difference (clitic production: 63% in Mex-Spanish versus 95% in Greek and F-DP production: 28,6% in Mex-Spanish versus 0% in Greek).
For the *within*-language difference, in the study of De la Mora (Mex-Spanish 1), the production of clitics is much lower than expected and than attested by Bedore & Leonard (Mex-Spanish 2). Moreover, there is a remarkable production of Full DPs instead of a clitic in the former study. These findings can be accounted for either by the task or by language differences.

Let's consider the difference in the task first. They are both elicitation tasks, however, Bedore & Leonard's task for the elicitation of object clitics consisted of a two-picture sequence and the experimenter described the first and the child was expected to describe the second. For example, consider a "sequence in which children washed a car and then pushed it. The child was asked to complete the sentence […] "The children washed the car and then ([they] it-push)." [Bedore& Leonard (2001); pg: 910]. In this case one has to be sceptical on how strong the context is and it is puzzling the authors themselves. They discuss a lot of "unscorable" responses which "…involved instances in which the child described the action using a construction that did not require the use of direct object clitic" [Bedore & Leonard (2001); pg: 915]. In

fact, it is rational for one to think that the child, for example, may use a Full DP in an attempt to be more "accurate" following the experimenter's way of description.

On the other hand, the one of De la Mora consists of pictures and a prompt question of the type "What X is doing to Y", after which the context that favours the use of the clitic is established. This method is used successfully by a number of researchers [Schaeffer (2000), Tsakali & Wexler (2004), Wexler et. al (2002), the present study] But De la Mora discusses that "The context given strongly favoured a clitic object rather than a full lexical phrase […] However, this is not the only kind of possible response. Even when the context of all the sentences in the test promoted the use of clitics, it was common to get other valid responses, such as full lexical NPs" [De la Mora (2004): 33], which poses an issue of a possible language difference between Mexican and continental Spanish. We do know that several dialects of Spanish exist that have slight syntactic differences, which are not yet understood and described in detail and can possibly influence the performance in the experiment, although this needs more elaboration both in the acquisition and the syntax domain.
Another issue is that, studies in Spanish SLI, both experimental task and corpus analysis are conducted in "semi"-bilingual children. E.g. children that are brought up in the USA and speak Spanish as a first language (Bedore & Leonard (2001). According to the authors, they assessed that children didn't know English in a "first-language" level by providing them with a test that below a threshold score described them as "non-English" speakers, hence Spanish monolinguals. Although this technique is rational, it is not yet established how reliable it is.

One then has to decide what is actually being tested; the preference and trend of children in their use of complements, or their knowledge of clitics. Moreover, it remains to be decided what would be considered as omission of a clitic and how production of full DPs should be interpreted.
If we isolate the elicitation tasks and compare the data we can clearly see the trend and the dissociation between both the omission and production of clitics in languages of Group I and of Group II (Figures 3a and 3b[14]).

[14] In those figures we also included our results that will be discussed in a following section, in order to demonstrate the trend.

Figure 3a

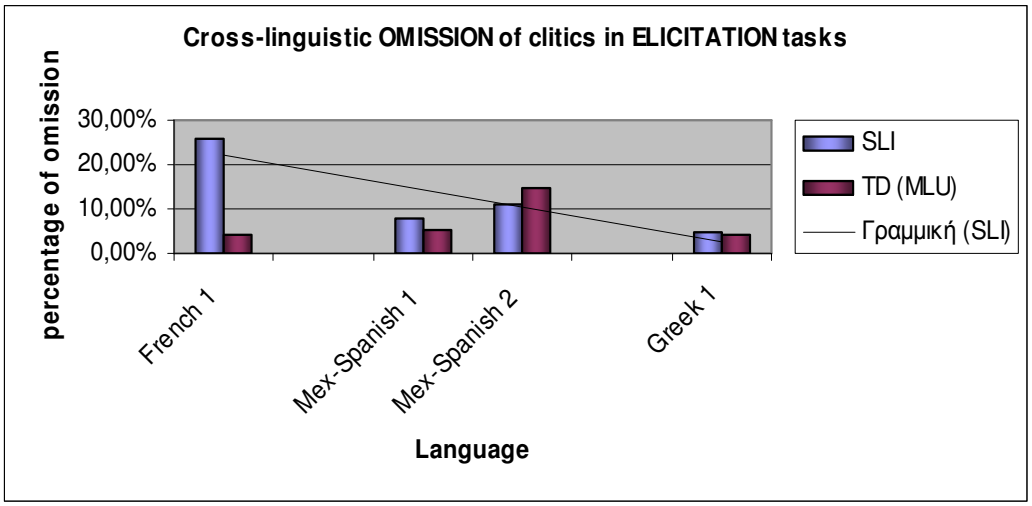
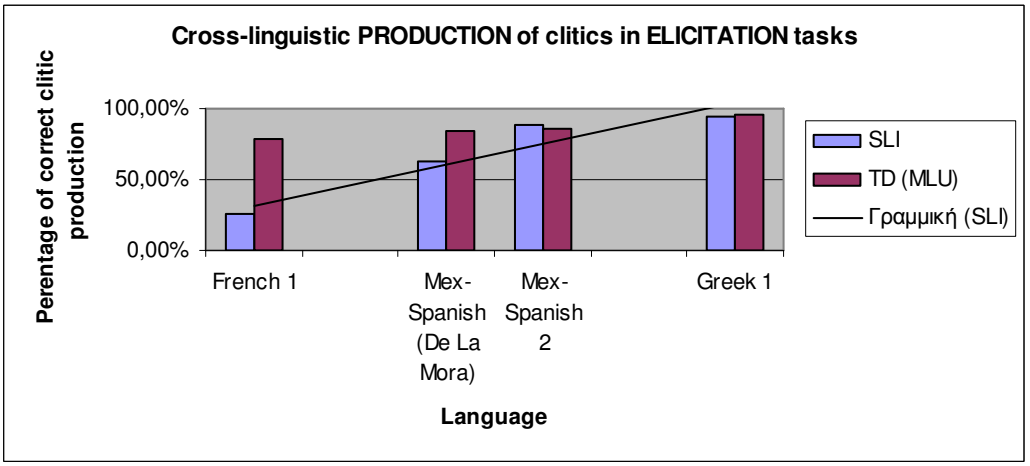


Figure 3b.



In Figure 3a, the omission rate drops almost linearly as we move from languages of Group I to the ones of Group II. The pattern is reversed in the production rates as depicted in Fig. 3b. However, it is obvious that more research is needed; data from elicitation tasks in Italian and Catalan would shed some light on further qualifying the theories and the results.

CHAPTER 4

The experiment: Clitics in Greek-speaking children with SLI

From the discussion until now, it becomes apparent that the trend of Typically Developing children regarding clitic production/omission and the distinction between languages seems to hold for SLI children as well. This phenomenon is predicted by the framework we support in this study; namely OCl and EOCl stage. The goal was then to obtain more data in this direction.

An experiment for Greek speaking children with SLI was designed and the prediction is straight forward. Since they are subject to UCC that leads them to EOCl stage, they are expected to perform as the TDs of a younger age that undergo the OCl stage, showing no omission of clitics, at least not in a significantly high percentage and definitely a lot less than children with SLI that speak languages of Group 1 (French/ Italian).

4.1 Participants

The Subjects that participated in the experiment were 19 children with Specific Language Impairment (SLI) and a control group of 32 Typically Developing children.

The SLI children ranged from age 4;10 to 8;1 (mean age 6;2) and were recruited from the "Civic Centre for Psych Health" in Virona, Athens and from the "Centre for Psych Health for Children and Adults" in Kalithea, Athens (Table 14). These centres consist of different sections that take care of children and adults with various problems and one section is dealing with children and language development, which is the one that we addressed. Because there is not an identified clinical marker for SLI in Greek, the children were basically chosen with respect to clinical diagnosis that reported severe and persistent difficulties with language. We also made sure that they meet the standard inclusion criteria (as presented in the definition of Wood (1985) in the previous chapter):

- No history of otitis media
- Normal non verbal-IQ (that corresponded the one of Typically Developing children of the same age)
- No severe socio-emotional difficulties or autism
- No neurological damage

The control group of Typically Developing children ranged from age 3;1 to 6;0 (mean age 3;10- see Tables 14 and 15 in Appendix A3 for the detailed table) was recruited from a private nursery school, in Athens and the children were randomly picked by their teachers. They were assessed, by a therapist, to develop typically, with no language, mental, neurological or any sensory-motor disorder.
This group served as a comparator group, matched for linguistic level, in order to make sure that any deviation in performance of the children with SLI is due to their language disorder and not due to general developmental factors[15].

In all SLI and TD children the Diagnostic Verbal IQ (DVIQ) for Greek- Part I; Preschoolers was conducted (2;5 – 6;0 years old) [Stavrakaki & Tsimpli (1999)], which consists of a production and a comprehension part that are further divided in subparts; vocabulary and morphology-syntax for the production part and meta-linguistic notions and morphology-syntax for the comprehension part. We are interested in production so we didn't conduct the comprehension part of the test. This test is preferred in Greek studies over the MLU measurement, firstly, because of the unavailability of calculations of MLU in the particular language. But even more because the fusion morphology of Greek, which reflects person, number, tense, aspect and voice, prevents the omission of verbal affixes and therefore counting the number of morphemes may not be as indicative of the linguistic level as in the other languages [Stavrakaki (2001)].

[15] In the study we didn't include a control group that would match the SLI group in chronological age, because at the chronological age of the SLI group, TD children are documented to have mastered proficiently their native language. Even more, our results of the TD group (matched in linguistic age) scored in a way that supported further these observations.

The lack of any MLU norm (or correspondent alternative) and of a standardized test (in Greek) that can map linguistic age to the corresponding chronological age necessitated some reflection on which age to target for the TD group. Based on the evidence from Wexler & Rice (1995) that children with SLI demonstrate a delay in linguistic development of about 2 to 3 years and we chose our first 10 TD children to be around the age of 3 and tested them in the DVIQ. Our factor of the matching and comparison of the two groups was the vocabulary size. The results in the vocabulary test of those TD children didn't differ significantly from that of our SLI group; hence our target age was correct. We tested as many children as it was possible, in that age range, in order to come up with a suitable matching group.

Although the TD children were picked by their teachers, their personal consent and desire to participate was a factor for inclusion; the ones that didn't want to, did not participate at all and the ones who showed discomfort in the first stages of the experiment (2 cases) were released and are not included in the analysis.
All children, in all groups, are native monolingual speakers of Greek and live in Athens.

The experiment was also conducted on 15 adults, to check for its validity. All of them scored 100% in the whole 30-item task.

4.2 Method

The experiment was an elicitation task and replicated closely the one of Schaeffer (2000) [and also Tsakali and Wexler (2005) and Wexler, Gavarró and Torrens (2003)].
15 transitive verbs were used, and were all chosen based on their high frequency, from an adult corpus of natural speech and were the following: "kiss (*filao*)", "wash (*pleno*)", "eat (*troo*)", "comb (*htenizo*)", "hit (*htipao*)", "cut (*kovo*)", "hug (*agaliazo*)", "cut one's hair (*kurevo*)", "feed (*taezo*)", "lick (*glifo*)", "pet (*haedevo*)", "read (*hold*)", "shave (*ksirizo*)", "water (*potizo*)".
In each experimental condition (different target verb each time) a picture was presented to the child that depicted a transitive, non self-oriented action;

1. A boy kissing a girl (target clitic: Feminine)
2. A man washing a little boy (target clitic: Masculine)
3. A rabbit eating a carrot (target clitic: Neuter)
4. A woman combing the hair of a little girl (target clitic: Feminine)
5. A brown-hair boy hitting a blond-hair boy (target clitic: Masculine)
6. A boy cutting a flower (target clitic: Neuter)
7. A boy hugging his mum (target clitic: Feminine)
8. A young man cutting the hair of an old-man (target clitic: Masculine)
9. A woman feeding a baby (target clitic: Neuter)
10. A dog licking a small girl (target clitic: Feminine)
11. A boy petting a dog (target clitic: Masculine)
12. A boy reading a book (target clitic: Neuter)
13. A girl holding an umbrella (target clitic: Feminine)
14. A boy shaving his father (target clitic: Masculine)
15. An old lady watering a flower (target clitic: Neuter)

The researcher first presented the characters and the items depicted to strengthen the context in favours of a clitic response. She then asked the children a question, which described the picture and was of the form "What is X doing (to) Y?"[16]. By mentioning the Y as a full DP, context conditions were provided, which promoted the use of the clitic instead of the full DP in the answer. The child was, therefore, expected to give an answer of the type "clitic + Verb". As explained before, clitics agree in gender, case and number with the DP they substitute. For that reason we used 5 feminine, 5 masculine and 5 neutral objects, yielding 5 feminine, 5 masculine and 5 neutral clitics respectively (in the distribution shown above).

[16] The proposition *to* is into parenthesis because in Greek the verb "kano" (do) can take either a direct or an indirect complement. Our study focuses mainly on direct object clitic and hence the question didn't include the preposition.

To exemplify the experimental condition, consider the following picture

Experimenter: [This is a rabbit and he is holding a carrot]

Q: *Ti kani o lagos to karoto?*
What is doing the-M bunny the-N carrot?
[What is the bunny doing (to) the carrot?]

Adult answer: *To troi*
The-cl- N eating
[He is eating it]

Each child was tested separately in a classroom of his/her school. Before the experiment began, there was a familiarization phase, between the experimenter and the child, to make sure that the child felt comfortable and understood the task. After this phase, the child was told that he/ she is going to play a game with the experimenter during which they would see some pictures, describe them and maybe create a story about them.

The pictures were folded in a booklet and were drawn in a simple and descriptive way for the children to understand the characters and the actions. Each page contained one picture. The experimenter would describe the characters, with the help of the child (to make sure he/she understood) and then she would ask the prompt question. In the cases where the child didn't answer the first time, the experimenter would rephrase the summary of the picture and repeat the question, in the *exact* way as the first time.

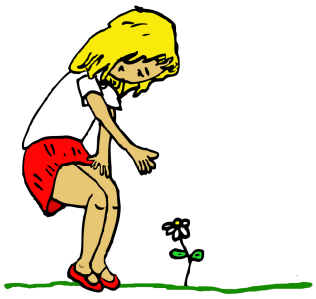
There was no need for a third prompt or for a different type of elicitation because all children gave an answer after the first or, at most, the second prompt. The experimenter would *never* produce a clitic during the experimental phase. The answers were noted in an answer sheet in which both the experimental sentence along with the target answer were written. If the answer of the child was one with a clitic, it was noted with a "plus" (+) in the corresponding column. If the answer did not contain a clitic, it was indicated with a "minus" (-) and the alternative answer was written down. Notice that we are primarily interested in the production of clitics as a

linguistic element, so we considered *all* clitic forms as "production of a clitic" (hence as a "+"), even the ones that may differ in number or gender from the target one, and kept them available for later analysis. Even more, if the verb given by the child was not the intended one but the clitic was correct, the answer was considered correct, because our question was not the use of certain verbs. However, the alternatives that were given were noted in the answer sheet (Appendix A3).

The answer sheets were, afterwards, transcribed and analyzed, distributing the answers according to ± clitic, ± gender, ± number, and ± case features.

In the cases of children who showed signs of loss of attention, loss of interest or fatigue the experiment was completed in 2 sessions (at most 2 days apart).

In addition to the experimental conditions, 15 control items were used, which were presented in the exact same way as the experimental ones picture followed by a prompt question. This time, the question was of the type "Whom/ What does Verb X" and the expected answer was "determiner in accusative + NP" as exemplified below:



Experimenter: *Ti* *kovi* *to* *koritsi?*
What is cutting the-N girl?
[What is the girl cutting?]

Adult answer: *To* *luludi*
The-acc flower
[The flower]

The verbs used were the following: "look (*kitazo)*", "feed *(taezo)*", "kiss *(filao)*" (x2), "waive *(cheretao)*", "kick *(klotsao)*", "watch *(parakolutho)*", "save *(sozo)*", "hold in lap *(agaliazo)*", "splotch *(lerono)*", "hug *(agaliazo)*", "scold *(malono)*", "cutting hair *(kurevo)*". The distribution of the gender of the expected determiner was controlled as in the experimental items (3 gender groups* 5 verbs each = 15 filler/control items). As one can notice, not all verbs in the control conditions are different from this of the experimental condition because we wanted to preserve the high frequency and level of difficulty of the prompt questions. This doesn't affect the performance of the

participants or the balance of the experiment because the target construction of clitics production does not depend on the verbs.

The control/ filler items were of this type because in Greek, the clitics have the same morphophonology as the determiners in all their types of case, as illustrated in §2.2.1, so what is really tested is clitic omission as a structure and not clitics as a weak phonological element. In that way, we make sure that the "poor" or unstressed phonology that clitics have will not be a caveat in their performance, as the "Surface Hypothesis", or any other processing-based hypothesis, would predict.

4.3 Results

The scores in the control and the experimental condition were highly correlated (at a 0.01 level –two tailed) and the threshold of the controls was set at 93%, which corresponds to 1/15 wrong answers. The function of the threshold was to minimize, as possible, the variation of the group. As was explained in Chapter 3, the heterogeneity of SLI and the unavailability of standardized ways of identification, calls for extra restrictions. In that way, we made sure that our group had in all levels similar performance in the control conditions and linguistic levels. 3 children of the TD group (20%, 53%, 60% correct controls) and 2 of the SLI group (13%, 6% correct controls) didn't reach the threshold and were excluded from the analysis. Moreover, 5 of the TD children scored more than one standard deviation (3,3) below the score of the children of their chronological age and not only were excluded from the analysis but also were referred to a therapist.

From the analyses of the experimental items we excluded the one with the verb *read* because it is not a strictly transitive verb and the object (or the clitic) is not necessary; both answers (a) and (b) in (Q23) are felicitous[17].

[17]Analyses were conducted with this item included as well and no significant difference with the ones that we present here was observed. I chose to exclude it and present the resulting analyse because in order to test our hypothesis we need to provide a context that will strongly yield the use of a clitic and that is not achieved with a semi-transitive verb.

(23) Q: *Ti kani to pedi to vivlio?*
What is doing the boy the book
[What is the boy doing to the book?]

A: a) *To diavazi*
It-cl reading
[He is reading it]

b) *Diavazei*
Reading-3rd sing
[He is reading]

The analyses were based on the data obtained by the groups shown in Table 16 below:

Table 16: Design of the experiment

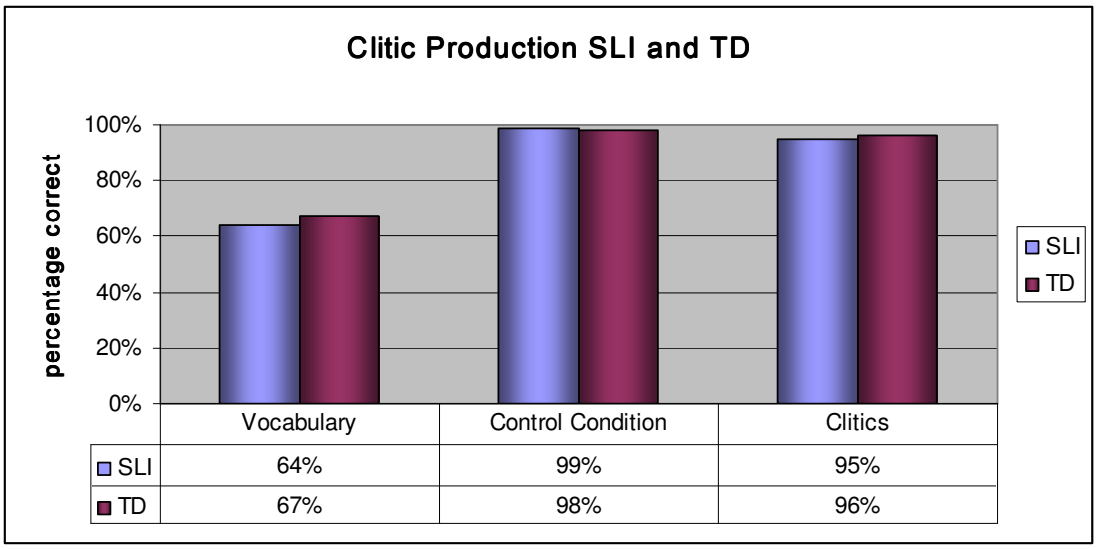
Group	*N*	Mean Age	Mean Vocabulary Score	# of Exper. Items	# of Control Items
SLI	17	6;2	64% (17,2/27)	14	15
TD	27	3;10	67% (18,1/27)		

We carried out analyses of the performance of the two groups, of individually matched pairs, and between High and Low Vocabulary groups as will be discussed below.

4.3.1 Overall results

The two groups (SLI and TD) are matched in vocabulary level which we consider to be the most indicative measure of linguistic level in the particular language.
The overall results are presented in Figure 4 below:

Figure 4: Results of Greek-speaking children with SLI and of TD



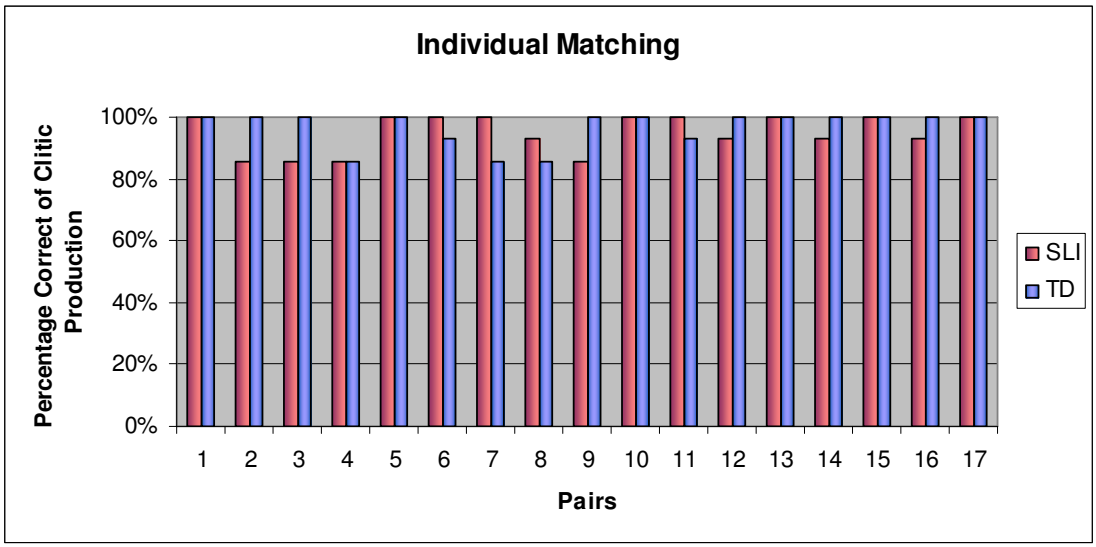
	Vocabulary	Control Condition	Clitics
SLI	64%	99%	95%
TD	67%	98%	96%

Both groups performed at ceiling in the control condition of accusative determiners, as expected. The percentages for the production of clitics are also remarkably similar between the SLI and TD group and close to perfect. One-way ANOVA with linguistic group as an independent factor and clitics as the dependent value, further verified this, showing no difference in means ($F_{1,42;.05}$= 0.836, p = .35).

4.3.2 Individually matched performance

We then matched each of the SLI children with one of the TDs in terms of the raw score of the vocabulary test ± 1 (Figure 5). Because we had more TD children, when there were more options to select from, priority was given to sex and age matching. All pairs were strongly correlated in the vocabulary score (r=0.989, p<0.01 level (two-tailed)) and their matching was successful. No significant difference in the production of clitics, between each pair, was attested (t (16) = -0.846, p=0.4)

Figure 5: Individual matching of SLI and TD



4.3.3 Break down to High/Low Vocabulary Groups

The SLI and the TD group were further divided in two sub-groups, based on their vocabulary raw scores (high and low vocabulary levels) , which resulted in 4 groups as shown in Table 17 and their results in Table 18.

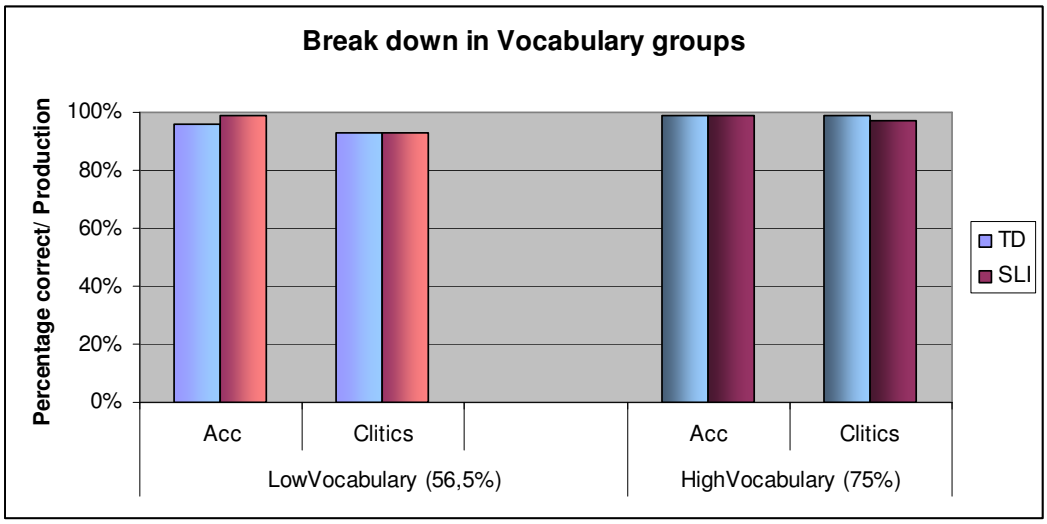
Table 17: Groups based on Vocabulary level

	group	*N*	*mean age*	*vocabulary score*
Low Vocabulary	SLI	10	6;5	56% (15,1/27)
	TD	12	3;7	57% (15,3/27)
High Vocabulary	SLI	7	6;2	75% (20,3/27)
	TD	15	4;2	75% (20,1/27)

Table 18: Performance based on Vocabulary level

	Conditions	*TD*	*SLI*
Low Vocabulary (*M* = 56,5%)	Control (Determiner)	96%	99%
	Experimental (Clitic)	93%	93%
High Vocabulary (*M* = 75%)	Control (Determiner)	99%	99%
	Experimental (Clitic)	99%	97%

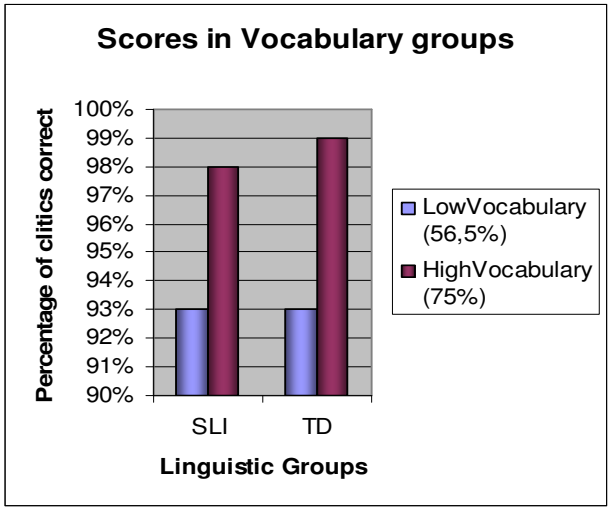
Figure 6: Break down in High/Low Vocabulary Groups



Analysis with a two-way ANOVA with clitics as the dependent variable and Vocabulary Group (High/Low) and Linguistic Group (TD/SLI) as the independent factor was carried out. There was no effect of Linguistic group ($F_{1,40}$=4.612, p=0.277) or of the interaction between the groups ($F_{1,40}$= 0.086, p=0.771).There was an effect of the Vocabulary Group ($F_{1,40}$= 78.66, p=0.071). L.S.D.[18] post hoc pairwise comparisons revealed that children in the Low Vocabulary groups (both TD and children with SLI) produced significantly less clitics even than the TDs of High vocabulary (p=0.024 and p=0.018 respectively). Moreover, there was an effect *within* the TDs with High Vocabulary children performing significantly better than Low Vocabulary ones (p= 0.024). No significant effect was found in the SLI and TD children of High Vocabulary (all significant differences at a=0.05).

[18] L.S.D. stands for Fisher's "Least Significance Difference" criterion.

Figure 7: Percentages of the clitics correct in High/Low and SLI/TD groups



The above results lead us to conclude that what influences the production of clitics is the vocabulary lever (linguistic level) rather than the existence of the disorder.

4.3.4 Error analysis

All errors were omissions except for 2 responses that were Full DPs; one by an SLI and one by a TD child.

3 children from the TD group gave a clitic with wrong gender (1 neutral instead of masculine and 2 neutral instead of feminine), which constitutes 0.8% of the total answers counted as production of clitic.

From the SLI group, 4 children gave 6 clitics with wrong gender (1 masculine instead of feminine and 3 neutral instead of feminine), which constitutes 4% of the answers counted as production of clitic. No errors in number or case were manifested.

CHAPTER 5
Conclusion

The goal of this study is to contribute to an understanding of the acquisition of clitics in children with SLI. The experiment was well balanced and successful in providing us with unbiased and consistent results across the participants. Therefore it provides evidence that Greek-speaking children with SLI do not have any problems regarding the production of clitics. This result reflects on several topics in the study of both typical and distorted language. It complies with the view that SLI perform in general as their younger TD peers, namely that they follow a parallel but delayed pathway in acquiring language. It also justifies the proposal of a developmental constraint which restricts children's grammar in a unified way. Syntactically, it is an indication of the difference in the syntactic status of clitics in Italian, French and Catalan compared to the ones in Spanish, French and Romanian. And, of course, it would be brilliant if this was all about it…

This study showed what is unproblematic with Greek-speaking children with SLI, namely clitics, but did not explore what *is* problematic. Systematic research and a programme devoted to that disorder are needed, which will explore in detail different constructions and mechanisms in the language acquisition of the particular population and will find out what exactly this disorder affects. It is very important that we reach the point of being able to securely identify the disorder in a young age. This way, children with SLI can be treated early enough and compensate for their language delay faster and more effectively.

In parallel to that, experimental studies are still missing in some languages (e.g. Italian, Romanian). Moreover, replication of the results and/or amelioration of the existing methods would be more than needed.

This study might contribute to the bigger issue of language faculty that is whether language acquisition is the result of *experience* alone or of *innate* mechanisms. From that study alone it would be naive to imply that I have provided *proof* for the *innateness* of language. Nevertheless, it seems to me that the experienced-based approach is challenged from the present and the previous work conducted in the domain, and at least a refinement or revisit of it would be necessary. As the evidence shows, children affected by the same disorder seem to have manifestations that are

different in terms of which structures are distorted across languages but similar *within* language groups, as they have been defined by observations in typical development. Therefore, in my opinion, it would be insufficient to think that language is there only due to experience rather some biological malfunction, specific to language, should cause this "uniform" reaction. .

To put it in a nutshell, SLI has a broad phenotype and the picture can clear up only with systematic research and interchange of data, ideas and results.

***

Appendices

A1. Tables for clitic acquisition in Typical Development

Table 2: Use of clitics in Augustine's corpus (the context is *not* considered)

French

age	*complement contexts*	*null objects*	*%*	*object clitics*	*%*	*lexical objects*	*%*
2;0,2	12	4	33.3	0	0	8	66.6
2;0,23	20	5	25	0	0	15	75
2;1,15	10	4	40	0	0	6	60
2;2,13	19	5	26.3	1	3.8	13	69.9
2;3,10	23	9	39.1	0	0	14	60.9
2;4,1	20	5	25	0	0	15	75
2;4,22	21	4	19	1	5	16	76
2;6,16	50	10	20	2	3.9	38	76.1
2;9,2	69	10	14.4	10	14.3	49	71.3
2,9,30	65	14	21.5	22	33.9	29	44.7
total	*309*	*70*	*22.6*	*36*	*11.6*	*203*	*65.7*

Table 3: Elicitation task: Clitic complements (in obligatory context)

Italian [Schaeffer (2000): pg.76]

age	*overt clitics*	*omitted clitics*	*full direct objects*
2	22% (22)	64% (63)	66.6
3	62% (179)	15% (43)	75
4	89% (237)	0% (0)	11% (28)
5	91% (227)	0% (0)	9% (23)
adults	*100% (439)*	*0% (0)*	*0% (0)*

Table 4: Elicitation task: Clitic complements in present tense context

Catalan [Wexler et al. (2002)]

age range	*clitics used*	*clitic omission*	*lexical objects*
1;10-2;11,24 Mean Age: 2;3,5	22.6% (7/31)	74.2% (23/31)	3.2% (1/31)
3;0,8-3;11,29 Mean Age: 3;6,7	68.2% (30/44)	25% (11/44)	6.8% (3/44)
4;3,1-5;1,0 Mean Age: 4;6,27	95.7% (45/47)	4.2% (2/47)	0 % (0/47)

Table 5: Elicitation task: Clitic complements in present tense context

Spanish [Wexler et al.(2002)]

age range	clitics used	clitic omission	lexical objects
2;6,7-2;11,6 Mean Age: 2;8,18	100% (32/32)	0% (0/32)	0% (0/32)
3;5,2-3;11,13 Mean Age: 3;7,14	97.5% (39/40)	2.5% (1/40)	0% (0/40)
4;4,9-4;11,23 Mean Age: 4;,13	100% (40/40)	0% (0/40)	0% (0/40)

Table 6: Elicitation task: Clitic complements

Romanian I [Avram (1999)]

age range	*overall omission*	*average omission (cv)*	*response rate*
2 (2;4, N=3)	15/25	42% (1.02)	34%
3 (3;2, N=8)	32/133	25% (1.00)	56%
4+ (4;3, N=5)	7/56	10% (1.70)	44%
Total (3;4, N=16)	*54/214*	*24% (1.13)*	*48%*

Table 7: Elicitation task: Clitic complements

Romanian II [Babyonyshev & Marin (2006)]

age range	*object clitic*	*clitic omission*	*full DP object*
2 (*M*= 2;5 *N*=12)	38% (94/193)	60% (96/193)	2% (3/193)
3 (*M*= 3;6 *N* =13)	93% (361/387)	6.5% (24/387)	0.5% (2/387)
<2 MLU (*M*= 2;7 *N*=7)	16% (25/104)	82% (78/104)	2% (1/104)
>2 MLU (*M*= 3;3 *N*=18)	86% (430/476)	13% (42/476)	1% (4/476)

A2. Tables for clitic acquisition in Specific Language Impairment

Table 8: SLI -Spontaneous speech: clitic omission

Italian [Bottari et al. (1998): pg. 297]

participant	*type*	*MLU*	*filled clitics*	*empty clitics*	*empty clitics %*
SS	R/E	2.7	3	0	-
MFun	R/E	1.5	0	3	-
MFan	R/E	2.2	25	54	68
EG	R/E	2.8	1	0	-
JM	R/E	2.3	0	0	-
MFab	E	2	1	5	83
JT	E	4	8	7	46
SG	E	3.7	4	2	33
DG	E	3.5	11	1	8
AR	R/E	2.4	17	4	19
PF	R/E	2.2	9	4	30.7
mean		*2.6*			*41.1*

Table 9: SLI - Spontaneous speech: clitic production/ omission

Catalan [Gavarró (2007)]

child	*transcript*	*age*	*MLU*	*clitic production*	*clitic omission*
J	1st	3;9	1.5	0	1 (100%)
	2nd	4;9	4.7	4 (28.6%)	10 (74.1%)
A	1st	3;7	1.3	1 (100%)	0
	2nd	4;10	3.1	5 (35.7%)	9 (64.3)
mean				10 (33.3%)	20 (66.6%)

Table 10: SLI - Spontaneous speech (in experimental environment) and Elicitation task: clitic production

Spanish [De la Mora (2004)]

method	*clitics*	*full DP*	*omission*	*other*
Spontaneous Production	157 (37%)	150 (36%)	39 (9%)	6(2%)
Elicited Production	191 (45%)	120 (29%)	34 (8%)	3 (0,7%)

Table 11: SLI - Spontaneous speech: clitic production

Greek I [Varlokosta (2000), (2002)]

phase	*Age*	*Clitic production*
I (February 2000)	3;4	0%
II (May- June 2000)	3;8	0%
III (September 2000)	3;11	0%
IV (November 2000)	4;1	88%
V (February 2001)	4;4	100%

Table 12: SLI - Spontaneous speech: clitic production

Greek II [Alexaki, Driva & Terzi: " The Archimedes corpus"]

child	*Age (age; months)*	*sex*	*clitic contexts*	*omission of clitics*	*production of clitics*
NIK	3;7	F	6	0 (0%)	6 (100%)
DIM	3;8	M	7	1 (14%)	6 (86%)
NAT	4;5	F	15	0 (0%)	15 (100%)

IRI	4;6	F	8	0 (0%)	8 (100%)
KON	5;4	M	12	0 (0%)	12 (100%)
MAR	5;7	F	6	0 (0%)	6 (100%)
KIM	5;10	M	13	2 (15%)	11 (85%)
MRN	5;10	F	15	0 (0%)	15 (100%)
PAN	6;2	M	12	0 (0%)	12 (100%)
VAG	7;4	M	3	0 (0%)	3 (100%)
Total/ Mean	*5;3*		*97*	*3 (3%)*	*94 (97%)*

A3 Details of the experiment

- Tables of the participants

Table 14: Participants in the Experiment: SLI

name	*age in months*	*sex*	*raw vocabulary score*
PP	74	Male	13
SE.	68	Male	14
KP	64	Male	15
SA	65	Male	15
XS.	76	Male	15
KG	85	Male	15
DI	97	Female	15
AV	69	Male	16
KN	76	Male	16
KX	94	Male	17
KZ	75	Female	17
RK	71	Male	18
DA	72	Female	19
PG	65	Male	21
MT	58	Male	21
KK	87	Male	22
PG	91	Male	23
PP	74	Male	13
mean	*75,7 (months)* *6;2 (years; months)*		*17,18 (raw)* *64% (out of 27)*

Table 15: Participants in the Experiment: TD

name	*age in months*	*sex*	*raw vocabulary score*
KA	37	Female	11
AM	38	Male	13
RN	37	Female	14
SV	40	Male	15
PK	43	Female	16
KT	45	Female	16
FA-A	46	Female	16
EA	47	Male	16
KA	48	Female	16
AA	42	Male	17
KA	45	Female	17
KM	49	Male	17
PL	41	Female	18
TT	42	Female	18
LS	43	Male	18
VS	45	Male	18
GP	48	Male	18
M	40	Female	19
MA	41	Male	19
MS	42	Male	19
FN	43	Female	21
TA	47	Male	21
SC	68	Female	21
KA	44	Male	22
P	60	Male	23
GA	72	Female	24
XE-N	68	Female	25
mean	*46.7* *3;10 (years;months)*		*18.07 (raw)* *67% (out of 27)*

- Answer Sheet

#	Experimental Sentence	cl/ac	other
1	*Τι κάνει το αγόρι το κορίτσι?*		
(E1)	What is the boy doing (to) the girl		
	Το φιλάει		
	It-cl kissing (He is kissing her)		

2 *Ποιόν κοιτάει το κοριτσάκι να σκουπίζεται?*

(F1) Who is the girl looking drying herself?

Τη μαμά του

Her-acc mother

3 *Τι κάνει ο μπαμπάς τον γιό του?*

(E2) What is the dad doing (to) his son?

Τον πλένει

Him-cl washing (“He is washing him)

4 *Ποιόν ταΐζει ο Ανδρέας?*

(F2) Who is Andrew feeding?

Το σκύλο

It-acc dog. (“The dog”)

5 *Τι κάνει ο λαγός το καρότο?*

(E3) What is the bunny doing (to) the carrot?

Το τρώει

It-cl eating (“He is eating it”)

6 *Ποιόν φιλάει η γιαγιά?*

(F3) Who is grandma kissing?

Το παιδάκι

It-acc little boy (“The little boy”)

7 *Τι κάνει η μαμά την κόρη της?*

(E4) What is the mother doing (to) her daughter

Τη χτενίζει

Her-cl combing (“She is combing her”)

8 *Ποιόν χαιρετάει το κορίτσι?*

(F4) (To) whom is the girl waiving?

Το δεινόσαυρο

The-acc dinosaur (“To the dinosaur”)

9 *Τι κάνει ο ξανθούλης στο μελαχρινό?*

(E5) What is the blondy doing (to) the black hair?

Τον χτυπάει

Him-cl hitting (“He is hitting him”)

10 *Ποιον κλοτσάει το αγόρι?*

(F5) What is the boy kicking?

Τη μπάλα

She-acc ball (“The ball”)

11 *Τι κάνει το αγόρι το λουλούδι?*

(E6) What is the boy doing (to) the flower?

Το κόβει

It-cl cutting (“He is cutting it”)

12 *Ποιόν παρακολουθεί ο σκύλος με τα κυάλια?*

(F6) Who is the cat watching with the binocular?

Το γάτο

He-acc cat (“The cat”)

13 *Τι κάνει το αγόρι τη μαμά?*

(E7) What is the boy doing (to) the mom?

Την αγκαλιάζει

Her-cl hugging (“He is hugging her”)

14 *Ποιόν θέλει να σώσει το γουρουνάκι?*

(F7) Who does the pig want to save?

Το λαγό

He-acc rabbit (“The rabbit”)

15 *Τι κάνει ο άνδρας τον παππού?*

(E8) What is the boy doing (to) grandpa?

Τον κουρεύει

Him-cl cutting hair (“He is cutting his hair”)

16 *Ποιόν κρατάει στην αγκαλιά η γιαγιά?*

(F8) Who is the grandma holding in her lap?

Τη γάτα

She-acc cat (“The cat”)

17 *Τι κάνει η μαμά το μωρό?*

(E9) What is mom doing (to) the baby?

Το ταΐζει

It-cl feeding (“She is feeding him”)

18 *Ποιόν λερώνει η κυρία?*

(F9) Who is the lady splotching?

Τον κύριο

He-acc man (“The man”)

19 *Τι κάνει ο σκύλος την κοπέλα?*

(E10) What is the dog doing (to) the girl?

Τη γλύφει

Her-cl licking (“He is licking her”)

20 *Τι θέλει να κόψει το κοριτσάκι?*

(F10) What does the young girl want to cut?

Το λουλούδι

It-acc flower (“The flower”)

21 *Τι κάνει το παιδάκι το σκύλο?*

(E11) What is the boy doing (to) the dog?

Τον χαϊδεύει

Him-cl petting (“He is petting him”)

22 *Ποιόν αγκαλιάζουν τα παιδιά?*

(F11) Who are the boys hugging?

Τη μαμά τους

She-acc mom their (“Their mom”)

23 *Τι κάνει το παιδί το βιβλίο?*

(E12) What is the boy doing (with) the book?

Το διαβάζει

It-cl reading (“He is reading it”)

24 *Ποιόν μαλώνει η γυναίκα?*

(F12) Who is the woman scolding?

Το παιδί της

It-acc boy her-gen (“Her boy”)

25 *Τι κάνει το κορίτσι την ομπρέλα?*

(E13) What is the girl doing (with/to) the umbrella?

Την κρατάει

Her-cl holding (“She is holding her”)

26 *Ποιόν φιλάει η πριγκίπισσα?*

(F13) Who is the princess kissing?

Το βάτραχο

He-acc frog (“The frog”)

27 *Τι κάνει το παιδί τον μπαμπά του?*

(E14) What is the boy doing (to) his father?

Τον ξυρίζει

Him-cl shaving (“He is shaving him”)

28 *Ποιόν κουρεύει ο κουρέας?*

(F14) Who is the barber cutting his hair?

Το αγόρι

It-acc boy

29 *Τι κάνει η γιαγιά το λουλούδι?*

(E15) What is the old lady doing (to) the flower?

Το ποτίζει

It-cl watering ("She is watering it")

30 *Ποιόν δείχνει ο γάτος?*

(F15) (To) who is the cat pointing?

Το δεινόσαυρο

He-acc dinosaur ("The dinosaur")

Tot.

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