

The Lack of Omission of Clitics in Greek Children with SLI: An Experimental Study

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The acquisition of direct object clitics has received much research attention. For the most part, children produce clitics in the appropriate positions, even though these positions are typically different than the positions for non-clitic direct objects. What is striking, however, is that in many languages, young children omit the clitic a great deal in production, even when it is required in the adult language. One of the most striking aspects of this phenomenon, however, is that it does not appear to be uniform cross-linguistically. Studies in typical development show that Italian- (Schaeffer, 1997; Guasti, 1994), French- (Hamman et al., 1996; Jacobowicz, 1997) and Catalan- (Wexler et al., 2002; Gavarró et al., 2010) speaking children omit clitics very often, whereas Spanish- (Wexler et al., 2002; Gavarró et al., 2010), Greek- (Tsakali & Wexler, 2003) and Romanian- (Babyonyshev & Marin, 2006) speaking children do not.

These differences are claimed to follow from a constraint on early child grammar, the *Unique Checking Constraint* (UCC; Wexler, 1998). Since the UCC is also claimed to apply (in an extended way) to children with Specific Language Impairment (SLI), the prediction is that SLI children speaking a particular language will omit clitics in a language in which TD children omit clitics (and at even an older age) but that SLI children will not omit clitics if they speak a language in which TD children do not omit clitics.

To the extent that there have been studies of SLI, this prediction is for the most part borne out: SLI children speaking French, Italian (Hamman et al., 2003; Arosio et al., 2010 among others) show high clitic omission, in contrast to children speaking Spanish (Bedore & Leonard, 2001). In Greek SLI, studies have been inconclusive until now; some claim that (accusative) direct object clitics are largely omitted (Tsimpli & Stavrakaki, 1999; Tsimpli, 2001), while other studies reveal no real omission (Varlokosta, 2002; Terzi, 2007). However, all of these studies are based on spontaneous speech data. It is difficult in spontaneous production data to know for sure that a clitic context is demanded. Thus, the field (since at least Schaeffer (1997)) has tried to decide this question via experimental methods, eliciting clitics in a highly controlled context. The goal of this study is to explore the acquisition of clitics in Greek-speaking children with SLI through just such an experiment.

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1. Acquisition of clitics

1.1. Typical development

As soon as clitics are acquired, they are productively used and they are not misplaced. However, in the first stages of development, children speaking some languages (i.e. Group I: Italian, French, Catalan) acquire clitics relatively late and optionally omit them (Guasti, 1994; Schaeffer, 1997; Hamman et. al., 1996; Jacobowicz, 1997; Wexler et al., 2002), while children speaking some other languages (i.e. Group II: Spanish, Romanian, Greek) use them productively already from the second year and do not tend to omit them (Wexler et al., 2002; Babyonyshev & Marin, 2006; Tsakali & Wexler, 2003).

To explain this cross-linguistic variation, Wexler (1998) proposed a maturation account, namely the UCC (1) in combination with the Minimal Violations Principle (MV) (2).

(1) Unique Checking Constraint (UCC)

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

(2) 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 UCC is a constraint that exists in children's grammar and goes away with development and maturation, resulting in the corresponding adult grammar. It was first proposed to account for the Optional Infinitive stage (OI), a stage during which children speaking non Null Subject languages sometimes use infinitives instead of tensed verbs. The idea was that Agreement or Tense had to be omitted by the children, resulting in an OI. By a similar type of logic, this constraint affects the derivation of clitics, depending on whether a language has participial agreement or not. The interaction of UCC with the syntactic requirements of clitic derivation results in the so-called Optional Clitic stage (OCI) (Wexler et. al., 2002; Tsakali & Wexler, 2003).

For the syntax of clitics, we follow Sportiche (1996)¹ and assume that clitics are heads of their own projection derived through the following operations (3), where, in order to focus on the relevant essentials we have omitted TP.

¹ Syntactic theories of clitics are distinguished into two kinds: is the clitic base-generated in surface position or does it *move* there from direct object position? Wexler stated the theory in terms of the base-generation idea, using in various papers the Sportiche (1996) analysis. Note that even in the base-generated theories, there has to be a relation between the direct object position and the clitic position; Sportiche (1996), in fact, has an empty direct object *pro* move. Wexler adopted a base-generation idea because it would then be straight-forward to make the analogy between how UCC applied to clitics and to OI's – via an omission of a functional category. However, he suggested (without providing an analysis) that quite possibly a movement account of clitics could find a way to account for the facts, using UCC. In this paper we won't attempt to provide such an analysis.

- (3) i. base-generated structure:
 [CIP [*clitic*] [AgrOP [AgrO] [VP V [DP *pro*_i]]]]
- ii. surface structure of a language **with** participial agreement
 [CIP *pro*_i [*clitic*] [AgrOP *t*_i [AgrO] [VP V [DP *t*_i]]]]
- iii. surface structure of a language **without** participial agreement
 [CIP *pro*_i [*clitic*] [AgrOP [AgrO] [VP V [DP *t*_i]]]]

In languages that do not have participial agreement (3iii), *pro* moves directly to CIP², and has to check one feature (the EPP). Since no constraint is violated, clitic omission by the child, even if of UCC age, is not expected. In languages that do have participial agreement, *pro* has to move through Spec-AgrOP before moving to CIP and must check its D-features against two functional projections (two EPP features, one for AgrO and one for Cl). If double-checking takes place, the clitic surfaces as in the adult grammar, with exactly this derivation. The UCC, though, is violated.

If UCC prevents double checking from taking place, the derivation cannot converge, since the two uninterpretable EPP features (one for AgrO, one for CIP) cannot both be checked and eliminated. Leaving an uninterpretable feature violates Full Interpretation (which says that there may be no uninterpretable features at the end of the derivation), so that the sentence does not converge, it is ungrammatical. Following the logic of the UCC applied to AGR and TNS in the OI case, one of the two has to be eliminated. One possibility is that AgrO (really *v*) is not projected³. The other possibility is that Cl is eliminated and the clitic is not spelled out. (Note that in that case the child will either produce an ungrammatical sentence or s/he will use a compensation strategy, for example, s/he will produce a sentence with a full DP as an object, a choice which is not ungrammatical, but it will not be the appropriate one in the given discourse and contextual conditions).

The two possible derivations (with *pro* checking two features or *pro* only checking one feature, the other omitted)⁴ compete and given the MV principle,

² As Wexler (1998) notes, since *pro* moves directly to Spec, CIP, a way has to be found to have case checked between AgrO (*v*) and *pro*. There are several possibilities that we won't discuss here.

³ It is an open question, discussed in the various UCC clitic papers we have referenced, whether the AgrO/*v* omission possibility can take place. If *v* omission means that *v* isn't projected at all, then even the verb can't be inserted, since it is selected by *v*. Thus any sentence with a verb must have a *v*. If this is so, then the Cl omission possibility is the only one. Even if both possibilities exist, still the clitic omission possibility is predicted.

⁴ The application of MV does not predict that clitics are omitted 50% of the time. There is no reason to think that the two possibilities (functional category omission or not) are equally likely. Exactly the same situation exists with regard to other OI stage phenomena. The child might have a preference for omitting or not omitting, given that both are possibilities. We would also expect that a child faced with two equal grammatical choices might prefer one that s/he hears more often. It is well-known that as a child ages, even while still in the OI stage, s/he produces a higher proportion of finite sentences. This

the one will be chosen which causes fewer violations. However, neither of the two is “worse”, so one will be chosen on chance and optional omission of clitics is expected.

To sum up, the properties and stages of clitic acquisition in Null Subject languages are:

Group I (French/Italian/Catalan):

- Participial agreement; participle agrees in gender and number with the object clitic
- Clitic has to check two D-features
- Optional clitic (OCI) omission stage; extended OCI stage in SLI

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 OCI stage; no extended OCI stage in SLI.

1.2. Specific Language Impairment

Turning to SLI, Hamman et al. (2003) studied the spontaneous speech of 11 French-speaking children with SLI that were divided into two age groups; 6 children aged 3;10-5;0 and 5 children aged 5;7-7;11 years. The two groups produced clitics at a rate of 18% and 40% respectively. As the authors conclude, “the omission and avoidance of object pronouns may thus be a genuine and persistent characteristic for French SLI” (Hamman et al., 2003: 157). In their study of bilingual French-English-speaking children with SLI, Paradis et al. (2003) include 7 monolingual children with SLI of mean age 7;6. Analysis of their spontaneous speech reveals a production rate of object clitics of 47%. Error analysis showed that the main effect in 82% of the cases was omission rather than substitution with a full DP. Jacobowicz et al.’s (1998) elicitation study of 13 French-speaking SLI children, between the ages of 5;7-13;0 (mean age 8;11), gave correct clitic production at a rate of 25.2%. The researchers also conducted a comprehension task in which children provided correct responses in 80,8% of the cases, a rate that shows that they have a grammar that interprets the clitic construction, but something prevents them from producing it.

In the case of Italian, a recent study by Arosio et al. (2010) carried out an elicitation task in 10 children with SLI, aged 6;4-8;7 years. Although the children were quite old, they produced clitics only around 60% of the time. Most of the errors were clitic omissions. Bortolini et al. (2006) conducted an elicitation task with 11 younger SLI children, aged 3;7-5;6, and found only 16.8% production of clitics, noting that the errors were mainly omissions. Bottari et al. (1998) analysed the spontaneous speech of 11 Italian-speaking

might be the result of using experience to delineate between choices. After all, when a grammatical phenomenon is optional, the adult speaker often produces one much more frequently than the other. We would also expect an individual child to produce a higher proportion of clitics as s/he ages, even while still in the OCI stage.

children with SLI, of mean age 6;3, and found that their mean omission of clitics was 41.1%, but individual variation was attested. Leonard and Bortolini (1998) studied production data of 21 Italian-speaking SLI children, ranging from 4;0-7;0 years of age, and observed that their use of the clitic reached 42%. The other 58% constituted omissions rather than substitutions or errors in features. Gavarró (2007) examined the natural speech of two Catalan-speaking children with SLI, aged 4;7 and 4;8 years, and observed that they omitted clitics in 64.3% and 71.4% of the cases respectively.

The picture changes in Spanish, although the available data is limited. Bedore and Leonard (2001) studied 15 Mexican-Spanish-speaking SLI children in San Diego, California, that were assessed to have “minimal” opportunity to learn English. Their age ranged from 3;11-5;6 years and their average MLU was 2.88. The experiment was a structured elicitation task and the group produced clitics correctly only 38.5% of the time, a percentage lower than the one of the MLU- and AGE- matched control groups. However, in their Table 6 (Bedore & Leonard, 2001: 915), in which the produced clitics are presented in detail, one can see an omission rate of 12.7%. The authors conclude that the performance of children with SLI may be lower than the MLU-matched controls, but not to a significant degree, and, moreover, they acknowledge that they have a lot of “unscored” responses, reconsidering the effectiveness on their task. De la Mora (2004) collected spontaneous speech during “toy-playing” and also conducted an elicitation task with 10 Mexican-Spanish-speaking SLI children (and two corresponding MLU- and AGE-matched groups) from Mexico City aging from 4;3-6;2 years and with MLU between 1.8-3.6. The total accuracy in the production of clitics is, as mentioned in the study, as low as 45%, but the calculation of errors included not only omissions but also substitutions in gender and number. Clitics, however, were omitted only in 8%-9% of the cases, a percentage much lower than the omission rate in the languages of Group I.

In Greek, the data show some divergence. Tsimpli and Stavrakaki (1999) studied the spontaneous speech of a 5;5 Greek-speaking girl diagnosed with SLI. They report 96% omission of clitics (83 out of 86 obligatory contexts). However, there is no independent measurement given regarding the child’s language level and the sentences that are mentioned as clitic omission consist only of one word, hence it is not clear if the child has an $MLU > 2$, that is, an MLU big enough to allow her to utter a sentence containing a clitic (clitic + verb). Babyonyshev and Marin (2006) argue that some early cases of clitic omission in Romanian arise simply because of an extremely limited ability to put a few words together at a very young age. This Greek child might have such a severe linguistic and/or cognitive deficit that she is still in the one word stage or close to it, so that we don’t get a test of clitic omission. Moreover, the instances reported in this study as clitic omission seem unclear in determining whether what is attested is clitic omission or intention of the girl to express something different, because not all contexts seem strong enough to (preferably) licence a clitic. In Tsimpli (2001) the spontaneous speech of 7 Greek-speaking children with SLI was analysed and the results are similar, very low production

of both object clitics (3,8%) and definite determiners (11,9%). The robust percentage of omission attested in these studies has never been duplicated by any other subsequent study. Varlokosta (2002) studied the spontaneous speech of a child diagnosed with SLI at the age of 3;3. The corpus was collected within a year and while the child was in speech therapy. The data is presented in five phases. Until the third phase, the child 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. Terzi (2007) collected spontaneous speech data from 10 Greek-speaking SLI children, 5 boys and 5 girls in an age range from 3;7-7;4. Their speech was not rich in establishing the type of context that calls for a clitic, however, the omission rate was extremely low. More precisely, one child omitted a clitic once out of 7 environments and another one 2 times out of 14 contexts (omission rate ~14%). All the other children used a clitic in all the corresponding cases showing no omission, substitution or other preference. These findings suggest that clitics do not appear to constitute a problematic element for Greek-speaking children with SLI.

The above review indicates a cross-linguistic variation in the acquisition of clitics for children with SLI, similar to the one attested in typical development, namely, Italian- and French-speaking children have relatively greater difficulties with clitic use than Spanish-speaking ones. In the case of Greek, and due to the inconclusive results, a need for an elicitation experiment becomes evident.

2. The experiment

We designed an experiment for Greek-speaking children with SLI to assess their competence regarding direct object clitic production. Our prediction was that Greek-speaking SLI children would perform as Greek-speaking TD children of a younger age that undergo the OCI stage, showing no omission of clitics, at least not in a significantly high percentage and definitely certainly a lot less than children with SLI that speak languages of Group I (French/Italian).

2.1. Participants

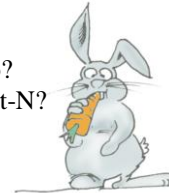
Nineteen (19) children with SLI and thirty two (32) TD children that served as a control group participated in the study. The SLI children ranged from 4;10-8;1 years (mean age 6;2) and were recruited from the "Public Centre for Mental Health" in Virona, Athens and from the "Centre for Mental Health for Children and Adults" in Kalithea, Athens. The children were chosen based on their clinical diagnosis that reported severe and persistent difficulties with language. They met the standard inclusion criteria: no history of otitis media, normal non-verbal IQ, no severe socio-emotional difficulties or autism and no neurological damage. The control group of TD children ranged from age 3;1-6;0 (mean age 3;10) and was recruited from a private nursery school in Athens. All children were assessed by a therapist to develop typically, with no language, mental,

neurological or any sensory-motor disorder⁵. We matched the SLI group and the TD group on vocabulary size using the production vocabulary sub-part of the DVIQ test (Stavrakaki & Tsimpli, 2000) given the lack of a standardized test in Greek that could be used for matching purposes at the point we conducted our study. The experiment was also conducted on 15 adults. All of them produced clitics in 100% of the cases.

2.2. Method

The experiment was an elicitation task that was based on Schaeffer (1997). The child was told that s/he and the experimenter are going to play a game during which they would see some pictures, describe them and maybe create a story about them. The researcher first described the picture and presented the characters and the items in it, in order to provide the context which favours a (accusative) direct object clitic response. She then asked the child a question of the form “what is X doing (to) Y?”⁶. The child was expected to give an answer of the type “clitic + verb”. In the cases where the child did not answer the first time, the experimenter would rephrase the description of the picture and repeat the question in the *exact* same 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. 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). Fifteen (15) transitive verbs were used: *filao* “kiss”, *pleno* “wash”, *troo* “eat”, *xtenizo* “comb”, *xtipao* “hit”, *kovo* “cut”, *agaliazo* “hug”, *kurevo* “cut one’s hair”, *taizo* “feed”, *ylifo* “lick”, *χajðevo* “pet”, *ðjavazo* “read”, *kratao* “hold”, *ksirizo* “shave”, *potizo* “water”. In each experimental condition (different target verb each time), a picture that depicted a transitive, non-self-oriented action was presented to the child, i.e. a bunny eating a carrot, etc. An example of the experimental condition is presented in (4).

- (4) Experimenter: Ti kani o layos to karoto?
 what does the bunny-M the carrot-N?
 ‘What is the bunny doing (to) the carrot?’
 Adult answer: To troi
 cl-N-Acc eat-3sg
 ‘He is eating it’



⁵ 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 known to show almost 0% of clitic omission.

⁶ The preposition *to* is in parenthesis because in Greek the verb *kano* “do” can take both a direct or an indirect complement. Our study focuses mainly on direct object clitic and hence the question didn’t include the preposition.

Fifteen (15) control items were also used, which assessed production of accusative definite determiners, which are morphologically identical to accusative object clitics. These items also served as fillers, so that the child wouldn't zero in on only one type of sentence. This time, the question was of the type "whom/what does X verb?" and the expected answer was "determiner [accusative] + NP", as illustrated in (5)⁷.

- (5) Experimenter: *Ti kovi to aʝori?*
 what cut-3sg the-N boy-N?
 'What is the boy cutting?'
 Adult answer: *To luludi*
 the-acc flower
 'The flower'



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", even the ones that may differ in number or gender from the target one, and kept them available for later analysis. Moreover, if the verb given by the child was not the intended one but the clitic was correct, the answer was considered correct, because our research question did not concern the use of certain verbs.

2.3. Results

The experiment is summarized in Table 1 below.

Table 1: Summary of experiment; participants, experimental and control items

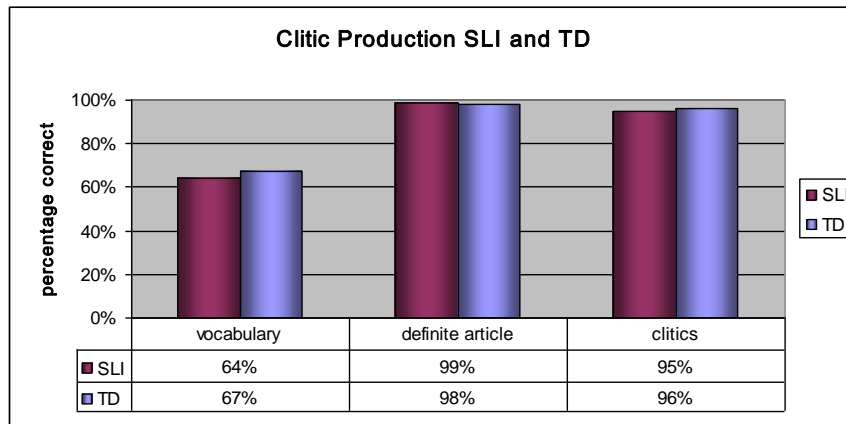
Group	#	Mean Age	Mean Vocabulary Score	# of Experimental Items	# of Control Items
SLI	17	6;2	64% (17.2/27)	15	15
TD	27	3;10	67% (18.1/27)		

We carried out analyses of the performance of the two groups as a whole, of individually matched pairs, and between High and Low Vocabulary groups.

2.3.1. Overall results

The overall results are presented below.

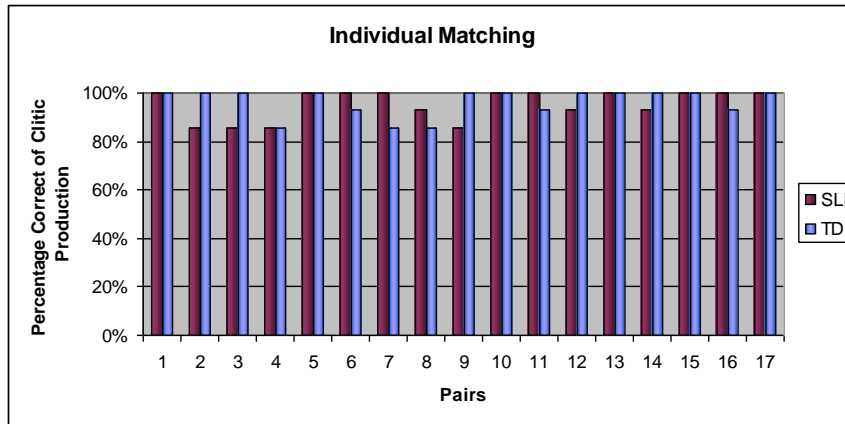
⁷ Gender was distributed evenly in both the experimental and control conditions (3 genders x 5 verbs each = 15 experimental/control items).



Both groups performed almost at ceiling in the control condition of accusative determiners. The percentages for the production of clitics are also remarkably similar between the SLI and TD group and close to perfect (95% or 96%). One-way ANOVA with linguistic group as an independent variable and proportion of clitics produced as the dependent variable verified the lack of a difference between SLI and TD, showing no difference in means ($F_{1,42;05} = 0.836, p=0.35$).

2.3.2. Individual matching

We also analyzed the data according to an even more precise standard, matching each of the SLI children with one of the TD children in terms of the raw score on the vocabulary test ± 1 . Because we had more TD children, when there was more than one TD child that matched an SLI child, we used sex and age matching to pick the most appropriate match. Since there were 17 children with SLI, the resultant groups had 17 children in each; data from the other 10 TD children were not included in this analysis. The matching was successful (the pairs were strongly correlated in vocabulary score, Pearson $r = 0.989$). No significant difference in the production of clitics, between each pair, was attested ($t(16) = -0.846, p=0.4$).



2.3.3. Breakdown 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 2.

Table 2: SLI High/Low vocabulary groups and their results in direct object clitics and definite determiners

	Group	#	Mean Age	Vocabulary Score	clitic	def. determiner
Low Voc	SLI	10	6;5	56% (15.1/27)	93%	99%
	TD	12	3;7	57% (15.3/27)	93%	96%
High Voc	SLI	7	6;2	75% (20.3/27)	97%	99%
	TD	15	4;2	75% (20.1/27)	99%	99%

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 variables 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 a borderline effect of the Vocabulary Group ($F_{1,40}= 78.66$, $p=0.071$), L.S.D.⁸. Post hoc pairwise comparisons revealed that children in the Low Vocabulary groups (both TD and SLI) produced significantly fewer clitics than the TDs of High Vocabulary ($p=0.024$ and $p=0.018$ respectively).

⁸ L.S.D. stands for Fisher’s “Least Significance Difference” criterion.

3. Discussion

The central issue that this paper investigates is the question of whether Greek-speaking children with SLI omit (accusative) direct object clitics. The answer is clear: almost never. By setting up clear semantic contexts for the use of a clitic, we were able to obtain a quantitative answer without worry about whether the context was actually a clitic context or not. In fact, there was almost no difference in the proportion of clitics omitted between SLI and TD children matched in vocabulary size. We have a sufficient number of participants that the experimental answer looks reliable.

We used the accusative definite determiner as a control (and filler) construction because we wanted to make sure the methodology worked and to see how much worse children would be on clitic production than on determiner production given morphological similarity of the two structures in Greek. In fact, they were so good on clitic production that there was very little to observe.

One would conclude that the UCC and its extended form for SLI correctly predict the important fact that Greek children with SLI do not omit clitics. Still, the SLI children omitted 5% clitics. Should this omission rate be taken to indicate that Greek is like Italian, French and so on, and that it omits clitics at a young age? We would argue no. In the study of language acquisition, quantitative rates are crucial. It is too easy to find a quantitatively small phenomenon that is due to a different cause than the one under consideration. The prediction of a “zero” rate always means “close to zero.” And this is nothing to apologize for. Other fields of cognitive science do not attain data as clear as this type of result in language acquisition. Rather, they are much more often only able to obtain a result like variable A is greater than variable B. We have in the case of the OI stage and its phenomena a much greater accuracy of prediction and confirmation.

One way to ask whether the rate of clitic omission in Greek SLI is quantitatively and qualitatively different from languages that are predicted to have clitic omission is via a comparison of rates. Here let us just consider one case, comparing our results to the results of Arosio et al. (2010) for Italian children with SLI. Their method was an elicitation method very much like our method. The SLI children ranged from 6;2-8;4 years with mean age 6;10. The SLI children in our study had a mean age of 6;2. Thus, we have a very similar study in Italian with somewhat older children. Arosio et al. (2010) found that their SLI group omitted clitics 40% of the time, compared to the 5% that we found for Greek SLI children in our study. This is really a huge difference.

How to account for the differences of a few papers, where more clitic omission in SLI was found?⁹ We already suggested some pitfalls in the use of

⁹ Our study was conducted in 2007. Smith (2008) conducted, independently, a similar experiment with 9 Greek-speaking SLI children and reports 18.8% accusative object clitic omission. Although clitic omission is higher in her study compared to ours, her results do not replicate those in Tsimpli and Stavrakaki (1999) and Tsimpli (2001).

spontaneous data and other issues. However, it is also possible that care must be taken to consider the definition of SLI. Possibly different investigators have identified SLI differently. We used clinical diagnosis, confirmed by vocabulary size (verbal IQ) and were very careful to observe exclusionary factors.

It is also possible that, as suggested in discussion with Ianthi Tsimpli and Theo Marinis, that Greek children with SLI show a good deal of clitic omission at a younger age than we have investigated here. While that is possible, it should be pointed out that such a finding would suggest that the SLI omission of clitics was a different phenomenon, due to a different cause, than the one that accounts for omission in languages like French and Italian. As Babyonyshev and Marin (2006) have argued on the basis of Romanian, it is possible that at the youngest ages, some kind of memory boundary on production length keeps sentences from being very long, and omission is not due to grammatical factors, but rather to a production constraint on young children. We could extend that hypothesis to older ages in SLI, if it turned out that very young Greek-speaking children with SLI omitted a great deal of clitics. It would be good to have an experimental elicitation study of younger SLI children to see if such a stage exists.

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