Grammatical Gender in Specific Language Impairment: Evidence from Determiner-Noun Contexts in Greek

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ABSTRACT

The present study investigates whether Greek-speaking children with Specific Language Impairment (SLI) face difficulties in the acquisition of gender in determiner-noun contexts, as expressed via agreement on the determiner. The results of an elicitation task with real and novel nouns showed that children with SLI (a) show difficulties primarily with masculine and feminine gender marking, and do not use prototypicality of the noun suffix, as typically developing children do, to mark the gender on the determiner in conditions with real nouns, and (b) do not use, with the same consistency as typically developing children do, the noun ending as a cue to mark the gender value on the determiner in conditions with novel nouns. It is argued that although grammatical gender is considered an intrinsic lexical property of the noun, it is not learned by children with SLI along with other lexical features of the noun. Moreover, when lexical information is not provided in the nouns, children with SLI cannot process morphology cues, such as the inflectional suffixes on the nouns, as consistently as typically developing children do.

Keywords: Specific language impairment, Gender marking, Gender assignment, Gender agreement, Determiner, Noun, Prototypicality, Greek.

1. Introduction

Gender is considered as one of the most puzzling grammatical categories in human language. Although it is assumed to be an inherent feature of the noun, it is also marked in the noun phrase (more precisely, in the determiner phrase; henceforth, DP) through an agreement relation (Corbett, 1991). It has been argued that agreement relations are vulnerable in children with Specific Language Impairment (SLI) (e.g., Clahsen, 1989). The somewhat scarce findings on the development of (grammatical) gender in the grammar of children with SLI indicate difficulties with gender marking

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and agreement in the DP (Bedore & Leonard, 2001; Keij et al., 2012; Mastropavlou, 2006). Gender in Greek has been argued to be an inherent property of noun stems (Ralli, 2002), which nevertheless can be predicted on the basis of morphological (i.e., inflectional suffixes) criteria (Ralli, 2002; Anastasiadi-Symeonidi & Cheila-Markopoulou, 2003). Recent psycholinguistic findings have confirmed the role of morphology in the assignment of gender to Greek nouns; inflectional suffixes that are unambiguous in terms of their gender value constitute sufficient gender cues for the adult native speaker (Mastropavlou & Tsimpli, 2011; Varlokosta, 2011).

Given the limited evidence on the difficulties that children with SLI face with gender marking and agreement in the DP, the present study aims at investigating whether Greek-speaking children with SLI face problems in the acquisition of gender in determiner-noun contexts, as expressed via agreement on the determiner.

2. Gender and its acquisition

According to Corbett (1991: 7-8), gender assignment depends on information about the meaning (animacy/sex) and form (morphology/phonology) of the noun. Although all language systems involve a semantic core to their assignment system, they fall essentially into three categories: (a) strict semantic systems, in which the meaning of the noun fully determines its gender without reference to its form (e.g., English) (ibid.: 8); (b) predominantly semantic systems, in which there are semantic assignment rules that allow sets of exceptions (e.g., Caucasian languages) (ibid.: 13); (c) formal systems, where gender is determined on the basis of rules that depend on the form of the nouns rather than on their meaning (e.g., German) (ibid.: 33).

Gender is closely related to agreement, since gender is realized through agreement in many languages, and gender agreement provides the basis for defining gender and for establishing the number of genders in a given language (ibid.: 105). Agreement refers to the concord of elements (e.g., determiners, adjectives, nouns) within the DP, regarding features such as gender. Thus, a noun is assigned gender in an inherent mode, whereas a determiner receives gender via an agreement relation with a noun within a DP.

Studies on typical development have shown that gender (assignment and agreement) is acquired early in a number of languages (for French: Karmilloff-Smith, 1979; Tucker, Lambert, & Rigault, 1977; for German: Szagun et al., 2007; for Hebrew: Berman, 1986; for Italian: Pizzuto & Caselli, 1992; for Spanish: Pérez-Pereira, 1991) (we do not review studies on the acquisition of gender by bilingual or L2 children). Nonetheless, gender is not acquired in the same way across languages but depends on the characteristics of the gender system in the acquired language. Gender is acquired earlier in languages with formal gender systems compared to languages with semantic or more arbitrary gender systems. For example, in languages with morphophonological assignment rules like French and German, gender is mastered quite early, by the age of 3;0 to 3;6 (e.g., Karmilloff-Smith, 1979; Szagun et al., 2007). In contrast, in languages with a less predictable gender assignment system, gender is acquired fairly late, by the age of 6;0 to 7;0 (for Dutch: Blom, Polišenská, & Weerman, 2008; Cornips & Hulk, 2006; De Houwer & Gillis, 1998; for Norwegian: Rodina & Westergaard, 2013). Similarly, gender in languages with a strict semantic system, like English, and semantic gender assignment in several languages appear to be mastered relatively late (Corbett, 1991).

Very few studies on the acquisition of gender in children with SLI have been carried out. SLI is a developmental language disorder, mainly characterized by substantially limited linguistic abilities and slow pace of developing language skills in the absence of hearing impairment, mental retardation, social-emotional disorders or neurological damage (Stark & Tallal, 1981). SLI can affect various language components such as syntax, morphology, phonology, vocabulary, semantics, and pragmatics (Leonard, 1998), although the difficulties observed in some language areas may be more prevailing compared to the difficulties observed in others. For example, children with SLI present lexical and phonological problems, which include slow rates of vocabulary acquisition (e.g., Rice, Buhr, & Nemeth, 1990), word storage and word access difficulties (see Johnston, 1988 for a review), as well as slow and much effortful development of their phonological system (see Leonard, 1998 for a review). However, deficits in morphology and syntax are usually reported to be more severe and profound compared to deficits in other language components. Typically, children with SLI omit or use inappropriately inflectional morphemes (e.g., Jakubowicz et al., 1998; Rice & Wexler, 1996) and face difficulties in the production and comprehension of complex syntactic structures (e.g., van der Lely & Stollwerck, 1997; Friedmann & Novogrodsky, 2011). It should be pointed out though that the exhibited symptoms associated with the deficit do not necessarily co-occur in children that are diagnosed with SLI. Thus, SLI forms a rather heterogeneous population.

Studies on the acquisition of gender in children with SLI suggest problems with gender marking and agreement within the DP. For example, low performance in marking gender concord between adjectives and nouns has been reported for Spanish (Bedore & Leonard, 2001), while gender errors on determiners have been observed in Dutch, a language with a less predictable gender assignment system (Keij et al., 2012). Although difficulties with gender agreement may point toward an agreement deficit in SLI (e.g., Clahsen, 1989), it has been shown that these difficulties are present only in production and do not affect comprehension as well, as children with SLI appear to be sensitive to agreement mismatches (Jakubowicz & Roulet, 2008 for French; but see Keij et al., 2012 for evidence that children with SLI show similar difficulties in the production and comprehension of gender in Dutch).

3. Gender and its acquisition in Greek

All declinable nominal categories in Greek (i.e., nouns, determiners, adjectives, pronouns, and numerals) are marked for one of the three gender values, namely masculine, feminine, or neuter. The gender value of a DP is determined by the gender value of the head noun and is spread to all its modifying elements through agreement. Greek belongs to formal systems within Corbett's (1991) categorization, as gender is determined to a large extent by formal rules rather than meaning; gender in a number of nouns denoting humans is unpredictable on semantic/sex grounds, while nouns denoting animals, inanimate objects, substances, natural phenomena, or abstract concepts may bear one of the three gender values (Holton, Mackridge, & Philippaki-Warburton, 2004). The role of semantic and formal rules in gender determination has been discussed in Ralli (2002) and in Anastasiadi-Symeonidi and Cheila-Markopoulou (2003).

According to Ralli (2002), gender assignment depends mainly on morphological information, as indicated by the systematic co-occurrence between certain inflectional classes and certain gender values (Table 1 – nouns of IC2 are masculine, nouns of IC3 and IC4 are feminine, while nouns of IC5, IC6, IC7, and IC8 are neuter).

However, Ralli (2002) points out that this one-to-one correspondence between gender and inflectional class breaks down in some cases, such as in nouns ending in *-os* (i.e., IC1), which can bear more than one gender value, in nouns of the same gender that belong to different inflectional paradigms (i.e., IC5, IC6, IC7, and IC8), or in cases where the same inflectional morpheme (i.e., *-os*) can appear in more than one inflectional paradigm (i.e., IC1 and IC7). Thus, Ralli (2002) claims that gender is an inherent property of stems and not of inflectional morphemes, and that in certain stems gender constitutes an intrinsic fully specified feature that is not motivated by semantic information or morphology (e.g., in nouns of IC1). The author argues though that there are cases where the gender value of a noun constitutes an optional underspecified feature that is predicted and can be specified by another co-occurring feature related either to semantic information (sex) (e.g., in [+animate] nouns of IC2, IC3, and IC4) or morphology (inflectional class) (e.g., in [-animate] nouns of IC2, IC3, and IC4, or in nouns that belong to IC5, IC6, IC7, and IC8).

Table 1
Inflectional classes of Greek nouns based on Ralli's (1994) division.

IC1 *-os* Masc/Fem	**IC2** *-s* Masc	**IC3** Ø Fem	**IC4** Ø Fem
o kípos 'garden'	*-as*: *o ximónas* 'winter'	*-a*: *i pórta* 'door'	*-i* [pl. *-is*]: *i léksi* 'word'
i próoδos 'progress'	*-is*: *o maθitís* 'student'	*-i* [pl. -es]: *i aγápi* 'love'	
	-es: *o kafés* 'coffee'	*-u*: *i alepú* 'fox'	
	-us: *o papús* 'grandpa'		
IC5 *-o* Neut	**IC6** *-i* Neut	**IC7** *-os* Neut	**IC8** *-ma* Neut
to vunó 'mountain'	*to xartí* 'paper'	*to páθos* 'passion'	*to kíma* 'wave'

Table 2
Gender assignment for Anastasiadi-Symeonidi and Cheila-Markopoulou (2003).

<table>
<tr><td rowspan="2"></td><td colspan="2">Prototypical</td><td colspan="2">Non-prototypical</td></tr>
<tr><td>+animate</td><td>-animate</td><td>+animate</td><td>-animate</td></tr>
<tr><td rowspan="2">Masculine</td><td colspan="2">-s</td><td colspan="2">-s</td></tr>
<tr><td>o patéras 'father'</td><td>–</td><td>–</td><td>o ximónas 'winter'</td></tr>
<tr><td rowspan="2">Feminine</td><td colspan="2">-a, -i, -u</td><td colspan="2">-s, -i, -a</td></tr>
<tr><td>i mamá 'mum'
i kóri 'daughter'
i alepú 'fox'</td><td>i epiθimía 'desire'
i práksi 'action'</td><td>i ipurγós 'minister'</td><td>i oδós 'street'
i záxari 'sugar'
i bála 'ball'</td></tr>
<tr><td rowspan="2">Neuter</td><td colspan="2">-o, -i, -a</td><td>-o, -i</td><td>-s</td></tr>
<tr><td>to vasilópulo 'prince'
to aγóri 'boy'
to γatí 'kitten'</td><td>to vunó 'mountain'
to trapézi 'table'
to kíma 'wave'</td><td>to próvato 'sheep'
to γurúni 'pig'</td><td>to δásos 'forest'</td></tr>
</table>

Alternatively, Anastasiadi-Symeonidi and Cheila-Markopoulou (2003) propose that gender assignment in Greek is predicted via the notion of *prototypicality*, which is defined on the basis of semantic (i.e., animacy and sex) and morphological (i.e., suffixation) criteria. Thus, prototypically masculine nouns denote a male referent and end in *-s*, while non-prototypically masculine nouns end in *-s* but are [-animate]. Prototypically feminine nouns denote a female referent or can be [-animate] abstract nouns ending in *-a*, *-i*, and *-u*, while non-prototypically feminine nouns are [+/-animate] nouns ending in *-s* and [-animate] nouns ending in *-a*, *-i*, and *-u*, that semantically do not belong to the prototypically feminine categories. Prototypically neuter nouns are [-animate] nouns ending in *-o*, *-i*, and *-a*, as well as [+animate] nouns ending in *-o* and *-i* (diminutives and baby humans/animals), while non-prototypically neuter nouns are [-animate] nouns ending in *-s*, and [+animate] nouns ending in *-o* and *-i* (non-diminutive nouns that denote animals). Thus, the suffix *-s* is considered as a marker of masculine gender, the suffixes *-a*, *-i*, and *-u* as markers of feminine gender, while the suffixes *-o*, *-i*, and *-a* as markers of neuter gender (Table 2).

The predictive value of suffixes in determining the gender value of a noun has been tested psycholinguistically in Mastropavlou and Tsimpli (2011), and in Varlokosta (2011). Both studies showed that adult native speakers use the information carried by the noun suffix to predict gender in the absence of semantic information in the noun or any phrasal information that would help them to determine gender based on agreement, thus, confirming the claim that morphology plays an important role in the assignment of gender to Greek nouns. The predictive value of suffixes did not coincide though with their ambiguity. Thus, the ending *-os*, although ambiguous, yielded high predictability, similarly to non-ambiguous endings, such as *-as*, *-is*, *-a*, *-o* (and *-ma*, which was predominantly assigned neuter gender despite the existence of some responses with feminine gender). However, the ambiguous ending *-i* yielded low predictability, as it was assigned feminine and neuter gender values, although neuter gender was more often assigned compared to feminine gender (Varlokosta, 2011). Note that although nouns of IC3 and IC4, i.e., feminine nouns with the endings *-i* and *-a*, have a zero (Ø) suffix within Ralli's (1994, 2002) approach, it turned out that at least the ending *-a* had high predictive value for adult native speakers (Mastropavlou & Tsimpli, 2011; Varlokosta, 2011).

Morphological cues in gender assignment seem to be used by Greek-speaking typically developing children as well. Gavriilidou and Efthimiou (2003) claim that 4;5 to 6;0 year old children assign gender based on the prototypicality of the noun suffix, as defined in Anastasiadi-Symeonidi and Cheila-Markopoulou (2003). In their study, children assigned gender appropriately to masculine, feminine, and neuter nouns that are prototypical in terms of their gender value, but faced difficulties with some non-prototypical nouns. Gavriilidou and Efthimiou (2003) point out that although children seem to be aware of prototypical categories quite early, they are still troubled by one prototypical category, namely, neuter nouns that are [+animate] (diminutives and nouns that denote baby humans/animals). It appears that 4-year-olds and 5-year-olds do not always perceive them as neuter, a fact that may be due to either semantic (these nouns denote humans with male or female referents) or morphological reasons (children confuse sometimes the ending *-i*, which is ambiguous between feminine and neuter gender). Moreover, the authors observe that the fact that children correctly assigned gender to some non-prototypical nouns, indicates that gender assignment at this age is determined primarily by morphological rather than semantic criteria, which is in line with previous cross-linguistic research on the acquisition of gender (e.g., Karmiloff-Smith, 1979; Tucker et al., 1977).

Mastropavlou (2006) investigates the acquisition of gender in 10 Greek-speaking children with SLI, aged 4;2 to 5;9 years, and 20 typically developing controls (half language-matched and half age-matched), through two experiments, one with real and one with novel nouns. With respect to real nouns, gender was marked correctly on the determiner across groups in the determiner-noun condition (Det-N), whereas incorrect gender marking (neuter gender overuse) on the determiner and/or the adjective was observed in the SLI but not in the two control groups in the conditions that included adjectives (Det-Adj-N and N-Adj). Performance of the SLI group on the Det-N condition was better compared to performance on the two conditions with adjectives. In contrast, the two control groups exhibited a difference in performance between the two conditions with adjectives, which involve different types of agreement, namely, better performance in the Det-Adj-N condition, which involves local agreement, compared to the N-Adj condition, which involves non-local agreement. Mastropavlou (2006) argues that children with SLI are affected by the elements involved in the DP (i.e., by the presence of the adjective), thus, producing more target responses in the Det-N condition compared to the two conditions with adjectives, while the control groups are affected by the type of agreement in the two conditions with adjectives, namely, local vs. non-local agreement. In the experiment with novel nouns, all groups exhibited low performance in gender marking, with the SLI group performing lower compared to the age-matched group but not compared to the language-matched group. The SLI group did not have strong gender preferences for most of the suffixes compared to language-matched controls, who showed more consistent preferences, and to age-matched controls, who had clear gender preferences. Moreover, the SLI and the language-matched group were not affected by the predictive value of the noun suffix, as opposed to the age-matched controls, who selected the target gender value for novel nouns with suffixes that have high predictive value more often than they did for novel nouns with suffixes that have low predictive value. According to the author, the fact that the language-matched group was not affected by the predictive value of the noun suffix to the same extent as the age-matched group indicates that gender representations develop at a late stage of language development. Moreover, the fact that children with SLI exhibited strong preference for the dominant gender option in ambiguous suffixes, such as -*i*, which have low predictive value, possibly indicates that non-dominant gender values are not activated in these children's grammar. Mastropavlou (2006) concludes that despite the qualitative differences observed between the SLI and the typically developing groups, in general children with SLI do not seem to face serious difficulties in the acquisition of the gender feature in Greek (ibid.: 227). Moreover, the author argues that the overuse of the neuter gender value by the children with SLI is associated to the difficulties they face not with the abstract feature of gender per se but with its morphological realization, in the absence of lexical information. In other words, children with SLI select a default gender value (i.e., neuter) because they cannot process effectively morphological cues, such as suffixation.

4. The present study

In the context of previous research on SLI in Greek and other languages, the present paper investigates the acquisition of gender, in the way it is marked on the determiner through agreement with the noun in Det-N contexts, in a group of children with SLI acquiring Greek. An elicitation task that comprised of real and novel nouns was designed, to assess (a) whether children with SLI have difficulties in the acquisition of gender and whether they use prototypicality, as defined in Anastasiadi-Symeonidi and Cheila-Markopoulou (2003), to mark the gender on determiners in Det-N contexts with a real noun, and (b) whether children with SLI use the noun suffix as a cue to mark the gender value on the DP in Det-N contexts with a novel noun. Regarding the first question, although children with SLI do not seem to face serious difficulties with gender agreement in Det-N conditions with real nouns, as shown in Mastropavlou (2006), the prototypicality of the noun suffix in the nouns assessed has not been taken into account. The present study examines gender marking on the determiner in Det-N contexts using nouns with prototypical and non-prototypical suffixes along the lines of Anastasiadi-Symeonidi and Cheila-Markopoulou (2003). Regarding the second question, the present study examines whether ambiguous noun suffixes –in terms of gender assignment– may cause greater difficulties to children with SLI compared to non-ambiguous suffixes in Det-N contexts with novel nouns, where semantic or phrasal information is not available.

4.1. Participants

Seven (7) monolingual Greek-speaking children with SLI, aged from 5;2 to 6;8 years (mean: 5;8, SD: 0.45), and two groups of typically developing (TD) children (one matched on language ability (LA) and

Table 3
Participants (SLI and LA): Age and DVIQ scores.

SLI group	Age (years;months)	DVIQ scores (vocabulary) /27	LA group	Age (years;months)	DVIQ scores (vocabulary) /27
P1	5;11	18	TD1	4;4	19
			TD2	5;4	17
P2	6;0	19	TD1	5;6	20
			TD2	5;4	19
P3	5;5	23	TD1	5;4	22
			TD2	6;0	24
P4	5;5	14	TD1	4;9	16
			TD2	5;2	17
P5	5;2	14	TD1	3;11	11
			TD2	4;2	16
P6	6;4	15	TD1	4;5	18
			TD2	4;3	15
P7	6;8	14	TD1	4;1	14
			TD2	5;0	15

one matched on chronological age (CA)) participated in the study. The LA group consisted of 14 TD children, aged from 3;11 to 6;0 (mean age: 4;8, SD = 0.76), which were much younger compared to the children of the SLI group ($t(19) = 3.602$, $p = .002$). Each child in the SLI group was matched to two LA children on the raw scores (within three points) of the vocabulary part of the Diagnostic Test of Verbal Intelligence (DVIQ) (Stavrakaki & Tsimpli, 2000) (see Table 3); the difference in the mean score of the vocabulary part of the DVIQ between the SLI and the LA group did not reach significance ($t(19) = -.407$, $p = .692$). The CA group consisted of 14 TD children, aged from 4;9 to 6;6 (mean age: 5;7, SD = 0.49). Each child in the SLI group was matched to two CA children on chronological age (within 6 months); the difference in the mean chronological age between the SLI and the CA group was not significant ($t(19) = .775$, $p = .436$). All children were diagnosed with a specific developmental language disorder (F.80, ICD-10, 1990) by specialized staff, on the basis of the selection criteria used in the relevant literature for SLI (Leonard, 1998); they demonstrated a normal range of nonverbal IQ (> 80 on the Wechsler Intelligence Scale for Children (WISC-III); Greek adaptation: Georgas et al., 1997), they scored more than 1.5 SD below the mean for their age on language tests (PLS-3, Zimmerman et al., 1992), they passed both a hearing screening and a visual-motor examination (DVTP-2, Hammill et al., 1993), they had no history of frank neurological impairment, no history of chronic Otitis Media, and no psychological or emotional disturbance. The TD children were recruited from middle/high SES public daycares and kindergartens, while the children with SLI were recruited from a Community Mental Health Center, where they received speech and language therapy. The SLI group has been assessed in other grammatical phenomena as well, and has been found to face difficulties with pronoun reference and perfective past tense (see

Table 4
Categorization of real nouns.

Masculine		Feminine		Neuter	
Proto typical	Non-proto typical	Proto typical	Non-proto typical	Proto typical	Non-proto typical
3 in *-os* [+anim]	3 in *-os* [-anim]	6 in *-a* [3 +anim, 3 -anim]	3 in *-a* [-anim]	3 in *-o* [-anim]	6 in *-s* [-anim]
3 in *-as* [+anim]	3 in *-as* [-anim]	6 in *-i* [3 +anim, 3 -anim]	3 in *-i* [-anim]	3 in *-i* [-anim]	6 in *-o,-i* [+anim, animals]
3 in *-is* [+anim]	3 in *-is* [-anim]		6 in *-os* [-anim]	6 in *-o,-i* [+anim, baby humans / animals]	

Table 5
Categorization of novel nouns.

Suffix	Gender	Number of items
-os	Masculine/Feminine/Neuter	12
-i	Feminine/Neuter	12
-as	Masculine	8
-is	Masculine	8
-a	Feminine	10
-o	Neuter	8
-ma	Neuter	6

Varlokosta & Nerantzini, 2012; Varlokosta & Nerantzini, to appear).

4.2. Materials and procedure

An elicitation test was used that included a total of 130 nouns, 66 real and 64 novel ones (Varlokosta, 2005a).

Real nouns were selected on the basis of Anastasiadi-Symeonidi and Cheila-Markopoulou's (2003) approach, thus, including nouns with both prototypical and non-prototypical suffixes. As shown in Table 4, real nouns consisted of: (i) eighteen (18) masculine nouns, 6 ending in *-os*, 6 ending in *-as*, and 6 ending in *-is*, half prototypical ([+animate]) and half non-prototypical ([-animate]) in each category; (ii) twenty four (24) feminine nouns, 12 prototypical ending in *-a* and *-i* (half [+animate] and half [-animate]), and 12 non-prototypical, 6 [-animate] nouns ending in *-a* and *-i*, and 6 [-animate] nouns ending in *-s*; (iii) twenty four (24) neuter nouns, 12 prototypical neuter nouns ending in *-o* and *-i*, half [-animate] and half [+animate] denoting baby humans or animals, as well as 6 non-prototypical [-animate] neuter nouns ending in *-s*, and 6 non-prototypical nouns ending in *-o* and *-i*, which comprised of [+animate] non-diminutive nouns that denote animals.

Novel nouns were modeled after real nouns, and contained nearly all possible inflectional endings of Greek nouns (*-os*, *-i*, *-as*, *-is*, *-a*, *-o*, *-ma*), as illustrated in Table 5 (for details on the design of the novel noun subpart of the test and for examples of novel nouns that were constructed for the purposes of the test, see Varlokosta, 2011).

Nouns were auditorily presented to the children, who were tested on an individual basis. Each noun was presented in the context of a game by the experimenter, who initially informed the children that words do not stand alone but have 'little friends' that accompany them. The child was instructed to produce together with each noun s/he heard, its 'little friend' as well, namely, the (definite) determiner (cf. Gavriilidou & Efthimiou, 2003). Six trial items (half with real and half with novel nouns) were given prior testing, for which feedback was provided. Repetition of the cueing noun was accepted upon request, although feedback as to the accuracy was not given during the task administration. During testing, self-corrections were allowed but only the final answer was analyzed.

4.3. Data analysis

Separate analyses were conducted for the Det-N conditions with real and for those with novel nouns. Regarding conditions with real nouns, the overall accuracy rates of each group were compared across and within groups per gender value. Additionally, the role of prototypicality was investigated by comparing the prototypicality of the noun suffix across and within groups for each gender value. With respect to conditions with novel nouns, the data was classified into two categories based on the suffix type (ambiguous vs. unambiguous suffixes). A comparison across and within groups was performed in order to investigate whether specific suffix types were more prone to errors. For the statistical analysis the Pearson's chi-squared test was used. Additionally, the Cramer's V, the Contingency Coefficient, and the η^2 values are reported to further denote the power of any associations between the compared variables.

4.4. Results

4.4.1 Real nouns

Overall, significantly lower performance was attested in the SLI group compared to both control groups in gender marking on the determiner in the Det-N conditions with real nouns (see Table 6) (SLI vs. LA: χ^2 (1, N = 1386) = 15.867, p = .000, Cramer's V = .107, Contingency Coefficient = .106, η^2 = .107; SLI vs. CA: χ^2 (1, N = 1386) = 81.579, p = .000, Cramer's V = .243, Contingency Coefficient = .236, η^2 = .243). Between group analyses indicated that the SLI group performed significantly lower compared to the LA and the CA group in the Det-N condition with masculine nouns (SLI vs. LA: χ^2 (1, N = 378) = 10.200, p = .001, Cramer's V = .164, Contingency Coefficient = .162, η^2 = .164; SLI vs. CA: χ^2 (1, N = 378) = 43.925, p = .000, Cramer's V = .341, Contingency Coefficient = .323, η^2 = .341), as well as in the Det-N condition with feminine nouns (SLI vs. LA: χ^2 (1, N = 504) = 14.865, p = .000, Cramer's V= .172, Contingency Coefficient = .169, η^2 = .172; SLI vs. CA: χ^2 (1, N = 504) = 40.844, p = .000, Cramer's V = .285, Contingency Coefficient = .274, η^2 = .285). Additionally, the SLI group performed significantly worse compared to the CA group in the Det-N condition with neuter nouns (χ^2 (1, N = 504) = 6.340, p = .012, Cramer's V = .112, Contingency Coefficient = .111, η^2 = .112). Within group analyses indicated that the SLI group performed significantly better in the Det-N condition with neuter nouns compared to the Det-N condition with feminine (χ^2 (1, N = 336) = 23.366, p = .000, Cramer's V = .264, Contingency Coefficient = .255, η^2 = .264) and masculine nouns (χ^2 (1, N = 294) = 9.188, p = .002, Cramer's V = .177, Contingency Coefficient = .174, η^2 = .177). In contrast, the LA group performed significantly better in the Det-N condition with masculine nouns compared to the Det-N condition with feminine nouns (χ^2 (1, N = 588) = 4.138, p = .042, Cramer's V = .084, Contingency Coefficient = .084, η^2 = .084), whereas the CA group performed significantly better in the Det-N conditions with masculine and neuter nouns compared to the Det-

Table 6
Accuracy rates (overall and across gender value) on Det-N conditions with real nouns across groups.

	Total Scores	Total Masculine	Total Feminine	Total Neuter
SLI	80% (370/462)	79% (99/126)	70% (118/168)	91% (153/168)
LA	89% (814/924)	90% (228/252)	85% (285/336)	90% (301/336)
CA	95% (881/924)	98% (248/252)	92% (309/336)	96% (324/336)

Table 7
Accuracy rates on Det-N conditions with prototypical vs. non-prototypical nouns across genders and groups.

	SLI	LA	CA
Masc_proto	81% (51/63)	90% (113/126)	98% (123/126)
Masc_non-proto	76% (48/63)	91% (115/126)	99% (125/126)
Fem_proto	74% (62/84)	90% (163/168)	95% (159/168)
Fem_non-proto	67% (56/84)	79% (132/168)	89% (150/168)
Neut_proto	94% (79/84)	86% (144/168)	95% (159/168)
Neut_non-proto	88% (74/84)	93% (157/168)	98% (165/168)

N condition with feminine nouns (masculine vs. feminine: χ^2 (1, N = 588) = 11.990, p = .001, Cramer's V = .143, Contingency Coefficient = .141, η^2 = .143; neuter vs. feminine: χ^2 (1, N = 672) = 6.125, p = .013, Cramer's V = .095, Contingency Coefficient = .095, η^2 = .095).

Regarding prototypicality of the noun suffix, within the SLI group, no significant difference in gender marking on the determiner was attested between Det-N conditions with prototypically and Det-N conditions with non-prototypically masculine (χ^2 (1, N = 126) = .424, p = .515), feminine (χ^2 (1, N = 168) = 1.025, p = .311), or neuter nouns (χ^2 (1, N = 168) = 1.830, p = .176), similarly to the CA group (masculine: χ^2 (1, N = 252) = 1.016, p = .313; feminine: χ^2 (1, N = 336) = 3.262, p = .071; neuter: χ^2 (1, N = 336) = 3.111, p = .078). However, within the LA group, significant differences were observed in gender marking on the determiner between the Det-N condition with prototypically and the Det-N condition with non-prototypically feminine nouns (χ^2 (1, N = 336) = 26.697, p = .000, Cramer's V = .282, Contingency Coefficient = .271, η^2 = .282), with better performance in the former compared to the latter condition. The reverse pattern was revealed in Det-N conditions with neuter nouns, namely better performance in the condition with non-prototypical neuter nouns compared to the one with prototypical neuter nouns (χ^2 (1, N = 336) = 5.390, p =.020, Cramer's V = .127, Contingency Coefficient = .126, η^2 = .127) (Table 7).

Nonetheless, some differences were observed in gender marking on the determiner between the SLI and the two control groups in the three gender contexts. Regarding DPs with prototypical noun suffixes, the SLI group performed significantly worse in gender marking on the determiner compared to both control groups in the condition with feminine nouns (SLI vs. LA: χ^2 (1, N = 252) = 31.547, p = .000, Cramer's V = .354, Contingency Coefficient = .334, η^2 = .354; SLI vs. CA: χ^2 (1, N = 252) = 22.530, p = .000, Cramer's V = .299, Contingency Coefficient = .286, η^2 = .299). In the condition with masculine nouns, the SLI group performed significantly worse compared to the CA group (χ^2 (1, N = 189) = 15.967, p = .000, Cramer's V = .291, Contingency Coefficient = .279, η^2 = .291), while the difference with the LA group did not reach significance χ^2 (1, N = 189) = 2.789, p = .095). In the condition with neuter nouns, no difference was observed between the SLI and the two control groups (SLI vs. LA: χ^2 (1, N = 252) = 3.819, p = .051; SLI vs. CA: χ^2 (1, N = 252) = .038, p = .846).

With respect to DPs with non-prototypical noun suffixes, the SLI group exhibited significantly worse performance in gender marking on the determiner compared to both control groups in the conditions with masculine (SLI vs. LA: χ^2 (1, N = 189) = 8.050, p = .005, Cramer's V = .206, Contingency Coefficient = .202, η^2 = .206; SLI vs. CA: χ^2 (1, N = 189) = 28.712, p = .000, Cramer's V = .390, Contingency Coefficient = .363, η^2 = .390) and feminine nouns (SLI vs. LA: χ^2 (1, N = 252) = 4.189, p = .041, Cramer's V = .129, Contingency Coefficient = .128, η^2 = .129; SLI vs. CA: χ^2 (1, N = 252) = 19.201, p = .000, Cramer's V = .276, Contingency Coefficient = .266, η^2 = .276). In the condition with neuter nouns, however, performance of the SLI group was significantly worse compared to performance of the CA group (χ^2 (1, N = 252) = 11.720, p = .001, Cramer's V = .216, Contingency Coefficient = .211, η^2 = .216) but not compared to performance of the LA group (χ^2 (1, N = 252) = 2.104, p = .147).

Given the rather unusual pattern observed in Det-N conditions with neuter nouns in the LA group, namely better performance in the condition with non-prototypical neuter nouns compared to the one with prototypical neuter nouns, an additional analysis was performed to investigate the role of animacy of the noun in these conditions (Table 8). It was observed that gender marking on the determiner was facilitated by the animate nouns in the non-prototypical neuter condition (χ^2 (1, N = 168) = 7.880, p = .005, Cramer's V = .217, Contingency Coefficient = .212, η^2 = .217) and by the non-animate nouns in the prototypical neuter condition (χ^2 (1, N = 168) = 15.750, p = .000, Cramer's V = .306, Contingency Coefficient = .293; η^2 = .306). Moreover, a comparison between the condition with prototypically neuter animate nouns vs. the one with non-prototypically neuter animate nouns showed that the former elicited significantly lower accuracy rates in gender marking on the determiner compared to the latter (χ^2 (1, N = 168) = 20.922, p = .000, Cramer's V = .353, Contingency Coefficient = .333, η^2 = .353).

4.4.2. Novel nouns

Overall, the SLI group showed similar trends to both control groups regarding the assignment of the target gender on the determiner in Det-N contexts with novel nouns (Table 9).

In particular, with respect to Det-N conditions that included novel nouns with non-ambiguous endings, the SLI group assigned the target masculine gender on the determiner more often compared to the other two gender values in DPs with novel nouns ending in *-as* and *-is* (*-as*: masculine vs. feminine: χ^2 (1, N = 112) = 20.353, p = .000, Cramer's V = .426, Contingency Coefficient = .392, η^2 = .426; masculine vs. neuter: χ^2 (1, N = 112) = 13.410, p = .000, Cramer's V = .346, Contingency Coefficient = .327, η^2 = .346; *-is*: masculine vs. feminine: χ^2 (1, N = 112) = 26.726, p = .000, Cramer's V = .488, Contingency Coefficient = .439, η^2 = .488; masculine vs. neuter: χ^2 (1, N = 112) = 28.922, p = .000, Cramer's V = .508, Contingency Coefficient = .453, η^2 = .508), similarly to the two control groups (LA: *-as*: masculine vs. feminine: χ^2 (1, N = 224) = 41.621, p = .000, Cramer's V = .431, Contingency Coefficient = .396, η^2 = .431; masculine vs. neuter: χ^2 (1, N = 224) = 78.019, p = .000, Cramer's V = .590, Contingency Coefficient = .508, η^2 = .590; *-is*: masculine vs. feminine: χ^2 (1, N = 224) = 123.817, p = .000, Cramer's V = .743, Contingency Coefficient = .597, η^2 = .743;

Table 8
Animacy scores for the Det-N conditions with neuter prototypical and non-prototypical nouns (LA group).

	LA group
Neuter_proto_animate	75% (63/84)
Neuter_proto_non-animate	96% (81/84)
Neuter_non_proto_animate	99% (83/84)
Neuter_non_proto_non-animate	88% (74/84)

Table 9
Overall scores for the Det-N conditions with novel nouns.

	SLI	**%**	**LA**	**%**	**CA**	**%**
Ambiguous suffixes						
Total Masculine -os	52/84	**62**	115/168	**68**	136/168	**81**
Total Feminine -os	8/84	**10**	20/168	**12**	8/168	**5**
Total Neuter -os	24/84	**29**	31/168	**18**	23/168	**14**
Total Masculine -i	9/84	11	33/168	20	25/168	15
Total Feminine -i	31/84	**37**	73/168	**43**	67/168	**40**
Total Neuter -i	41/84	**49**	61/168	**36**	76/168	**45**
Non-ambiguous suffixes						
Total Masculine -as	32/56	**57**	74/112	**66**	97/112	**87**
Total Feminine -as	9/56	16	26/112	23	12/112	11
Total Neuter -as	13/56	23	10/112	9	3/112	3
Total Masculine -is	37/56	**66**	93/112	**83**	101/112	**90**
Total Feminine -is	10/56	18	10/112	9	8/112	7
Total Neuter -is	9/56	16	8/112	7	3/112	3
Total Masculine -a	10/70	14	20/140	14	21/140	15
Total Feminine -a	45/70	**64**	101/140	**72**	106/140	**76**
Total Neuter -a	12/70	17	18/140	13	13/140	9
Total Masculine -o	13/56	23	30/112	27	15/112	13
Total Feminine -o	7/56	13	18/112	16	10/112	9
Total Neuter -o	35/56	**62**	63/112	**56**	86/112	**77**
Total Masculine -ma	2/42	5	13/84	15	10/84	12
Total Feminine -ma	12/42	29	26/84	31	18/84	21
Total Neuter -ma	26/42	**62**	45/84	**54**	55/84	**65**

masculine vs. neuter: χ^2 (1, N = 224) = 130.274, p = .000, Cramer's V = .763, Contingency Coefficient = .606, η^2 = .763; CA: *-as*: masculine vs. feminine: χ^2 (1, N = 224) = 129.110, p = .000, Cramer's V = .759, Contingency Coefficient = .605, η^2 = .759; masculine vs. neuter: χ^2 (1, N = 224) = 159.618, p = .000, Cramer's V = .844, Contingency Coefficient = .645, η^2 = .844; *-is*: masculine vs. feminine: χ^2 (1, N =224) = 154.557, p = .000, Cramer's V = .831, Contingency Coefficient = .639, η^2 = .831; masculine vs. neuter: χ^2 (1, N = 224) = 172.379, p = .000, Cramer's V = .877, Contingency Coefficient = .659, η^2 = .877). Moreover, all three groups assigned the target feminine gender on the determiner more often compared to the other two gender values in DPs with novel nouns ending in *-a* (SLI: feminine vs. masculine: χ^2 (1, N = 140) = 36.684, p = .000, Cramer's V = .512, Contingency Coefficient = .456, η^2 = .512; feminine vs. neuter: χ^2 (1, N = 140) = 32.226, p = .000, Cramer's V = .480, Contingency Coefficient = .433, η^2 = .480; LA: feminine vs. masculine: χ^2 (1, N = 280) = 95.487, p = .000, Cramer's V = .584, Contingency Coefficient = .504, η^2 = .584; feminine vs. neuter: χ^2 (1, N = 280) = 100.680, p = .000, Cramer's V = .600, Contingency Coefficient = .514, η^2 = .600; CA: feminine vs. masculine: χ^2 (1, N = 280) = 104.112, p = .000, Cramer's V = .610, Contingency Coefficient = .521, η^2 = .610; feminine vs. neuter: χ^2 (1, N = 280) = 126.401, p = .000, Cramer's V = .672, Contingency Coefficient = .558, η^2 = .672). Last, all groups assigned the target neuter gender on the determiner more often compared to the other two gender values in DPs that included novel nouns with the suffixes *-o* and *-ma* (*-o*: SLI: neuter vs. masculine: χ^2 (1, N = 112) = 17.646, p = .000, Cramer's V = .397, Contingency Coefficient = .369, η^2 = .397; neuter vs. feminine: χ^2 (1, N = 112) = 29.867, p = .000, Cramer's V = .516, Contingency Coefficient = .459, η^2 = .516; LA: neuter vs. masculine: χ^2 (1, N = 224) = 20.023, p = .000, Cramer's V = .299, Contingency Coefficient = .286, η^2 = .299; neuter vs. feminine: χ^2 (1, N = 224) = 39.161, p = .000, Cramer's V = .418, Contingency Coefficient = .386, η^2 = .418; CA: neuter vs. masculine: χ^2 (1, N = 224) = 90.895, p = .000, Cramer's V = .637, Contingency Coefficient = .537, η^2 = .637; neuter vs. feminine: χ^2 (1, N = 224) = 105.292, p = .000, Cramer's V = .686, Contingency Coefficient = .565, η^2 = .686; *-ma*: SLI: neuter vs. masculine: χ^2 (1, N = 84) =30.857, p = .000, Cramer's V = .606, Contingency Coefficient = .518, η^2 = .606; neuter vs. feminine: χ^2 (1, N = 84) = 9.419, p = .002, Cramer's V = .335, Contingency Coefficient = .318, η^2 = .335; LA: neuter vs. masculine: χ^2 (1, N = 168) = 26.964, p = .000, Cramer's V = .401, Contingency Coefficient = .372, η^2 = .401; neuter vs. feminine: χ^2 (1, N = 168) = 8.806, p = .003, Cramer's V = .229, Contingency Coefficient = .223, η^2 = .229; CA: neuter vs. masculine: χ^2 (1, N = 168) = 50.814, p = .000, Cramer's V = .550, Contingency Coefficient = .482, η^2 = .550; neuter vs. feminine: χ^2 (1, N = 168) = 33.164, p = .000, Cramer's V = .444, Contingency Coefficient = .406, η^2 = .444).

However, the comparison across groups revealed the following differences. Regarding the Det-N condition with novel nouns ending in *-as*, the SLI group assigned less often the target masculine gender to the determiner compared to the CA group (χ^2 (1, N = 168) = 18.182, p =.000, Cramer's V = .329, Contingency Coefficient = .313, η^2 = .329) and more often the neuter gender compared to both control groups (SLI vs. LA: χ^2 (1, N = 168) = 6.448, p = .011, Cramer's V = .196, Contingency Coefficient = .192, η^2 = .196; SLI vs. CA: χ^2 (1, N = 168) = 18.271, p = .000 Cramer's V = .330, Contingency Coefficient = .313, η^2 = .330). Regarding the Det-N condition with novel nouns ending in *-is*, the SLI group assigned less often the target masculine gender to the determiner compared to the LA (χ^2 (1, N = 168) = 6.138, p = .013, Cramer's V = .191, Contingency Coefficient = .188, η^2 = .191) and the CA group (χ^2 (1, N = 168) = 14.791, p =.000, Cramer's V= .297, Contingency Coefficient = .284, η^2 = .297). Moreover, the SLI group erroneously assigned feminine and neuter gender to the determiner in this condition more often compared to the CA group (feminine: χ^2 (1, N = 168) = 4.480, p =

.034,Cramer's V = .163, Contingency Coefficient = .161, η^2 = .163; neuter: χ^2 (1, N = 168) = 10.096, p = .001, Cramer's V = .245, Contingency Coefficient = .238, η^2 = .245).

Regarding ambiguous endings, no differences were revealed within each group between feminine vs. neuter gender values in the Det-N condition with novel nouns ending in *-i* (SLI: χ^2 (1, N = 168) = 2.431, p = .119; LA: χ^2 (1, N = 336) = 1.787, p = .181; CA χ^2 (1, N = 336) = .986, p = .321); moreover, there were no differences between the SLI and the two control groups regarding the assignment of feminine and neuter gender values (feminine: SLI vs. LA: χ^2 (1, N = 252) = .991, p = .320; SLI vs. CA: χ^2 (1, N = 252) = .209, p = .648; neuter: SLI vs. LA: χ^2 (1, N = 252) = 3.632, p = .057; SLI vs. CA: χ^2 (1, N = 252) = .287, p = .592). However, a significant preference for the masculine over the feminine or neuter gender value was obtained in the Det-N condition with novel nouns ending in *-os* within all groups (masculine vs. feminine: SLI: χ^2 (1, N = 168) = 50.193, p = .000, Cramer's V = .547, Contingency Coefficient = .480, η^2 = .547; LA: χ^2 (1, N = 336) = 111.752, p =.000, Cramer's V= .577, Contingency Coefficient = .500, η^2 = .577; CA: χ^2 (1, N = 336) = 119.111, p = .000, Cramer's V = .770, Contingency Coefficient = .610, η^2 = .770; masculine vs. neuter: SLI: χ^2 (1, N = 168) = 18.838, p = .000, Cramer's V = .335, Contingency Coefficient = .318, η^2 = .335; LA: χ^2 (1, N = 336) = 85.466, p = .000, Cramer's V = .504, Contingency Coefficient = .450, η^2 = .504; CA: χ^2 (1, N = 336) = 152.449, p = .000, Cramer's V = .674, Contingency Coefficient = .559, η^2 = .674). Furthermore, there was a difference between the SLI and the CA group in the preference of the gender value assigned to the determiner in the Det-N condition with novel nouns ending in *-os*; the SLI group assigned less masculine gender values (χ^2 (1, N = 252) = 10.723, p = .001, Cramer's V = .206, Contingency Coefficient = .202, η^2 = .206) and more neuter gender values compared to the CA group (χ^2 (1, N = 252) = 8.173, p = .004, Cramer's V = .180, Contingency Coefficient = .177, η^2 = .180).

5. Discussion

The present paper investigates the acquisition of gender in Greek-speaking children with SLI and in two control groups of TD children, one matched on language (the LA group) and one matched on chronological age (the CA group) to the SLI group. It is examined (a) whether children with SLI have difficulties in marking the gender on the determiner in Det-N conditions with a real noun and whether they use prototypicality, as defined in Anastasiadi-Symeonidi and Cheila-Markopoulou (2003), to mark the gender, and (b) whether children with SLI use the noun ending as a cue to mark the gender value on the determiner in Det-N conditions with a novel noun, where lexical information is absent.

Regarding our first research question, overall lower performance in gender marking on the determiner in DPs with real nouns was observed in the SLI group compared to the two control groups. The children with SLI obtained lower scores in DPs with masculine and feminine nouns compared to both control groups, and in DPs with neuter nouns compared to the CA group. Besides quantitative differences, there were qualitative differences as well. The SLI group performed better in DPs with neuter nouns compared to DPs with masculine or feminine nouns, whereas this was not true for the two control groups, which performed better in DPs with masculine (and neuter as far as the CA group is concerned) than feminine nouns. These findings are somewhat different from those reported in Mastropavlou (2006) for Det-N conditions with real nouns. In Mastropavlou's study the SLI group performed very well, similarly to TD controls, in gender marking and agreement on the determiner; moreover, masculine gender caused greater difficulties to the SLI group compared to feminine and neuter gender. The present study, however, includes a variety of Det-N conditions, namely DPs with prototypically masculine, feminine, and neuter nouns, and DPs with non-prototypically masculine, feminine, and neuter nouns in terms of gender assignment. When factors such as prototypicality of the noun suffix are taken into account, it appears that differences emerge between children with SLI and TD controls.

More specifically, prototypicality of the noun suffix did not have the same effect within each group. Although no differences were observed between Det-N conditions with prototypically and Det-N conditions with non-prototypically masculine, feminine, or neuter nouns, within the SLI and the CA group, prototypicality affected the performance of the LA children; higher rates were attested in DPs with prototypically feminine nouns compared to DPs with non-prototypically feminine nouns, while the reverse was true for the DPs with neuter nouns, namely, lower rates in DPs with prototypically neuter nouns compared to DPs with non-prototypically neuter nouns. Although the SLI group exhibited no differences in terms of gender marking on the determiner between Det-N conditions with prototypical and those with non-prototypical noun suffixes, it showed greater difficulties compared to the LA and the CA group in conditions with non-prototypical noun suffixes (feminine and masculine in the comparison with both control groups, and neuter in the comparison with the CA group). We take this fact (i.e., that performance on gender marking on the determiner was affected by the prototypicality of the noun suffix within the DP) to indicate that the difficulties in gender marking in the Det-N conditions we investigated in this study reflect difficulties in gender assignment on the noun, which surface as incorrect marking on the determiner through agreement (however, we should acknowledge that our experimental design did not directly access gender assignment on the noun).

The fact that prototypicality of the noun suffix in terms of gender assignment did not affect the SLI group in the same way as it did the LA group, and that children with SLI exhibited greater difficulties in conditions with non-prototypical noun suffixes compared to the two control groups, indicates that different mechanisms are involved in gender marking in typical and atypical development. Since gender is a lexical property of the noun, its assignment is expected not to be difficult for children with SLI, as they do not face problems with lexical knowledge in general. However, the findings of the present study suggest that although gender is an intrinsic lexical property of the noun, it is not learned by children with SLI along with the other lexical features of the noun. Specifically, although the prototypicality of the noun suffix is used in early stages of typical development, as indicated by the asymmetries between conditions with prototypical and those with non-prototypical feminine nouns within the LA group, children with SLI do not use prototypicality of the noun suffix to mark gender on the determiner with the same consistency as their LA peers do, as indicated by the low scores they obtained in the Det-N conditions with masculine and feminine nouns, regardless of the prototypicality of the noun suffix. This implies that they do not use semantic (i.e., animacy and sex) and/or morphological (i.e., suffixation) criteria to mark gender, as systematically as TD children do. The inconsistency in the use of the above criteria resulted also in profound difficulties with those conditions that included nouns with non-prototypical suffixes, and gave rise to responses that contained DPs with a default gender value. Although an error analysis was not presented in the paper, in the majority of erroneous gender marking on DPs with masculine and feminine nouns, neuter was the preferred gender in the SLI group. The fact that neuter gender functioned as a default choice in the grammar of the SLI group is consistent with the view that neuter is the unmarked gender in Greek (Anastasiadi-Simeonidi & Cheila-Markopoulou, 2003), as well as with findings on novel nouns from SLI (Mastropavlou, 2006) and findings from second language acquisition (Tsimpli 2003, Varlokosta, 2005b).

Before we discuss our second research question, a short note is at hand regarding prototypicality in typical development. The fact that prototypicality of the noun suffix affected the LA group in their assignment of gender to the determiner in DPs with feminine nouns, with better performance in the condition with prototypically feminine noun suffixes compared to the condition with non-prototypically feminine noun suffixes, confirms the claim that TD children are aware of prototypical categories quite early (Gavriilidou &

Efthimiou, 2003). The fact that the LA group performed worse in Det-N conditions with prototypically neuter noun suffixes compared to Det-N conditions with non-prototypically neuter noun suffixes seems though rather puzzling. A possible explanation for this finding lies in the divergent performance of the LA group between prototypical and non-prototypical neuter nouns that were animate (i.e., neuter animate nouns that denote baby humans and/or animals vs. neuter animate non-diminutive nouns that denote animals). Our data indicated that the former category elicited lower accuracy rates in gender marking on the determiner compared to the latter one. The category of neuter nouns that denote baby humans and/or animals appears to be particularly difficult for young TD children, as semantic information and morphology are in conflict (difficulties were observed primarily in the cases of nouns that denote baby humans, such as *to vasilopulo* 'the prince' or *to gitonopulo* 'the young neighbor'); thus, children quite often seem to assign gender to nouns of this category on semantic grounds (the difficulty that young TD children face with this category is also pointed out in Gavriilidou & Efthimiou, 2003). In contrast, the category of neuter non-diminutive nouns that denote animals, although non-prototypical within Anastasiadi-Symeonidi and Cheila-Markopoulou' (2003) analysis, presents no difficulties to young TD children, who use morphology (i.e., the inflectional suffix) to assign gender. However, more data as well as a more in depth analysis of the different categories is necessary before we reach firm conclusions regarding the effect of prototypicality of the noun suffix in terms of gender assignment in typical development.

Regarding our second research question, similar trends regarding gender marking on the determiner in Det-N conditions with novel nouns were observed within each group. With respect to conditions that included novel nouns with ambiguous endings, no differences were observed between feminine vs. neuter gender values in the Det-N condition with novel nouns ending in *-i*, while a preference for the masculine over the feminine or neuter gender value was obtained in the Det-N condition with novel nouns ending in *-os*. Similarly, with respect to Det-N conditions that included novel nouns with non-ambiguous endings, the SLI group assigned the target gender value to the determiner more often compared to the other two gender values, similarly to the two control groups. However, the comparison across groups indicated that the SLI group assigned less often the target gender to the determiner compared to the control groups of TD children, particularly in the case of DPs that included novel nouns with masculine suffixes. Specifically, the SLI group assigned less often the target masculine gender in DPs with novel nouns ending in *-is* (compared to both groups) as well as in DPs with novel nouns ending in *-as* and *-os* (compared to the CA group). At the same time, the neuter gender value was erroneously assigned in DPs with novel nouns ending in *-is* more often by the SLI compared to both control groups; neuter gender was also assigned in DPs with novel nouns ending in *-as* and *-os* (which allow neuter gender values) more often by the SLI group compared to the CA group.

These results indicate that the SLI group did not have strong gender preferences for some of the suffixes compared to TD controls, particularly compared to age-matched controls. This implies that in the absence of lexical information on the noun, TD children use the noun ending as a cue to mark the gender value on the DP in conditions with a determiner and a novel noun, particularly in the case of novel nouns with non-ambiguous endings. In contrast, children with SLI do not use, as consistently as TD children do, the noun ending as a cue to mark the gender value on the DP in novel noun conditions. Thus, it appears that when lexical information is not provided in the noun, children with SLI cannot process morphology cues, such as the inflectional suffix of the noun, as consistently as TD children do. This conclusion is in accordance with Mastropavlou's (2006) findings regarding gender preferences in children with SLI and TD controls. However, in our data we did not find strong preference for the dominant gender option in ambiguous endings, such as *-i*, which challenges Mastropavlou's claim that non-dominant gender values are not activated in the grammar of children with SLI. In contrast, we observed that the SLI group showed a preference for non-dominant gender options (specifically, for the neuter gender value) compared to the two control groups of TD children in the case of novel nouns ending in *-os* and *-as*.

To sum up, the present study provides evidence from Greek that children with SLI face difficulties in gender marking because they do not use, as systematically and effectively as TD children do, semantic and/or morphological information carried by the noun ending to assign gender on the determiner in DPs with real and novel nouns. The low performance observed particularly in DPs with real nouns ending in suffixes that are non-prototypical in terms of gender assignment suggests that difficulties in gender marking emerge in SLI when gender assignment is not predictable on semantic and/or morphological grounds (see also Keij et al., 2012 for difficulties that occur in SLI when the system of gender assignment is less predictable).

Before we conclude, we should address the limitations of the present study as well as its implications for clinical practice. The present study involves a small sample size, due to difficulties in finding participants in this clinical population because of its heterogeneity, and investigates the acquisition of gender only in Det-N contexts, as expressed via agreement on the determiner. Moreover, it examines gender assignment only in nominative contexts, not including the whole range of contexts in the inflectional paradigm (contexts with genitive and accusative case, contexts with singular and plural number), which would be more consistent with Ralli's (2003) approach to gender assignment. Consequently, further investigation is necessary, which should use larger samples as well as a greater variety of contexts to explore the acquisition of gender in children with SLI. Nevertheless, our findings could be exploited in the design of targeted intervention methods, which would provide children with SLI with a treatment that is suitable to their needs and weaknesses. Speech and language therapy offered to children with SLI could take into account the specific difficulties in gender marking identified here, and provide treatment with a focus on morphological processes in order to facilitate children's performance, particularly with emphasis on therapeutic techniques that potentially enhance the accessibility that children with SLI have to inflectional endings.

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Η απόκτηση του γραμματικού γένους στην Ειδική Γλωσσική Διαταραχή: Μαρτυρίες από περιβάλλοντα Άρθρου-Ουσιαστικού στην Ελληνική

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ΠΕΡΙΛΗΨΗ

Στην παρούσα μελέτη εξετάζεται η κατάκτηση του γένους σε περιβάλλοντα ονοματικής φράσης με οριστικό άρθρο και ουσιαστικό σε ελληνόφωνα παιδιά με Ειδική Γλωσσική Διαταραχή (ΕΓΔ). Τα πορίσματα μιας δοκιμασίας εκμαίευσης με λέξεις και ψευδολέξεις έδειξαν ότι τα παιδιά με ΕΓΔ (α) έχουν δυσκολίες στην απόδοση κυρίως του αρσενικού και θηλυκού γένους και δεν χρησιμοποιούν την πρωτοτυπικότητα της κατάληξης στο ουσιαστικό, όπως κάνουν τα παιδιά τυπικής ανάπτυξης, για να αποδώσουν γένος στο άρθρο της ονοματικής φράσης σε συνθήκες λέξεων και (β) δεν χρησιμοποιούν τόσο συστηματικά όσο τα παιδιά τυπικής ανάπτυξης την κατάληξη στο ουσιαστικό σαν ένδειξη για να αποδώσουν γένος στο άρθρο της ονοματικής φράσης σε συνθήκες ψευδολέξεων. Υποστηρίζεται ότι παρότι το γραμματικό γένος θεωρείται λεξική ιδιότητα των ουσιαστικών, δεν κατακτάται από τα παιδιά με ΕΓΔ ταυτόχρονα με άλλα λεξικά χαρακτηριστικά του ουσιαστικού. Επιπλέον, όταν οι λεξικές πληροφορίες στο ουσιαστικό δεν είναι διαθέσιμες, τα παιδιά με ΕΓΔ δεν επεξεργάζονται τις μορφολογικές πληροφορίες στην κατάληξη του ουσιαστικού τόσο συστηματικά όσο τα παιδιά τυπικής ανάπτυξης.

Λέξεις-κλειδιά: Ειδική γλωσσική διαταραχή, Απόδοση γένους, Εκχώρηση γένους, Συμφωνία γένους, Άρθρο, Ουσιαστικό, Πρωτοτυπικότητα, Ελληνική.

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