A preliminary investigation of grammatical gender abilities in Portuguese-speaking children with Specific Language Impairment[*]

MARISA SILVEIRA[1]

Abstract

This study investigates grammatical gender abilities children with SLI acquiring Portuguese in Brazil. Little is known about SLI in Portuguese, but a preliminary evaluation suggests that SLI children encounter problems with gender (Silveira, 2002). The work presented here is part of a larger study that aims at providing a thorough characterization of gender abilities in Brazilian children with SLI. Four experiments are reported. These experiments deal with abilities dependent on morphological information regarding gender, abilities to perceive mismatching gender features within the DP and gender agreement production abilities both within the DP and outside the DP domain (adjective in predicate position). Four children with SLI (6-9 year-olds) and 12 control children (5-7 years-old) have participated so far. Preliminary results reveal that the children with SLI generally perform less well than the typically-developing children.

1 Introduction

By school age, most children have already acquired the grammar of their native language. They have also acquired a wide vocabulary. For certain children, however, the process of language acquisition does not follow the normal pattern, even though they show no other apparent cognitive or neurological disorder that may account for their language deficit. These children are characterised as having a developmental language disorder known as Specific Language Impairment (SLI). Contrary to many other disorders that affect language, the aetiology of SLI is not yet known. The diagnosis of SLI is based mainly on exclusionary criteria: a child must not present any non-linguistic disorders despite the language delay[1].

English has been, undoubtedly, the most thoroughly studied language in the research field of SLI. Studies have reported a range of language problems (cf Leonard, 1998). Because English is not a rich language in terms of inflectional morphology, studies of English-speaking children cannot explore certain aspects of morphosyntactic nature that could potentially be problematic for children with SLI. Thus, cross-linguistic studies in pertinent languages can provide a better understanding of the disorder. Specifically, Portuguese — and Romance languages more generally — play an important role because of their rich inflectional system, which includes, for example, manifestation of gender and number agreement in elements in Determiner Phrases and in Participial Phrases.

Traditionally, research on SLI has been characterised by a polarisation of positions stemming from disciplines such as Linguistics, Psycholinguistics and Developmental Psychology[2]. These related fields have often tended to take opposing approaches, and attempts to explain the nature of SLI have focused heavily on the distinction between 'processing' versus 'linguistic' accounts. Assumptions made on the basis of this distinction have even served as grounds for one of the most popular research questions in the field: 'is SLI a processing or linguistic deficit?'. Such a polarisation, in my view, is misleading and unhelpful, and assumptions underlying it are not justified. Identifying the sort of language problems children with SLI encounter and describing them on the basis of formal linguistic models, without any reference to perceptual abilities required during the process of language acquisition is incomplete. On the other hand, attempts to identify the sort of input processing problems children with SLI might have without considering linguistic models that spell out the sort of knowledge that needs to be acquired by the child during the process of language acquisition are not exhaustive either[3]. An integrated approach to the study of SLI is needed, combining procedural accounts of Psycholinguistics with models of language provided by Linguistic Theory.

PhD student at the UCL Centre for Developmental Language Disorders and Cognitive Neuroscience, under the supervision of Professor Heather K. J. van der Lely.

[1] The actual specificity of SLI is, nevertheless, debatable, and researchers disagree with respect to the preservation of non-verbal abilities in these children. Due to space limitations, this paper will not go into this debate.

[2] See Leonard, 1998 for a review of the hypotheses that have been put forward to explain SLI.

[3] Usually, research on normal language acquisition is also characterised by such polarisation. Linguistic-oriented studies are carried out independently from studies of language development conducted within Psycholinguistics or Developmental Psychology. The situation in the research field of SLI seems to be more aggravated and explicit, nonetheless, as much of the discussion in the field concentrates on trying to explain the deficit on the basis of such polarisation.

The current paper investigates abilities related to gender agreement in children with Specific Language Impairment (SLI) acquiring Portuguese[4]. A preliminary evaluation of the characteristics of SLI in Portuguese has suggested that children with SLI encounter problems with gender (Silveira, 2002). Problems with gender in French and Spanish SLI have also been reported (Roulet & Jakubowicz, 2004; Restrepo & Gutierrez-Clellen, 2001; Anderson & Souto, 2005). The data to be presented here is part of a larger study that seeks to investigate the reasons underlying the gender-related difficulties children with SLI have and to evaluate the implications of such difficulties for the nature of SLI. The theoretical context that guides the current study is one that seeks to articulate linguistic theory with theories of language processing.

2 What is gender?

Gender is considered the most puzzling of the grammatical categories (Corbett, 1991). There is great variability among gender systems across languages. Agreement relations may involve determiners, adjectives, verbs, and sometimes even adverbs and conjunctions. As regards acquisition, a puzzling phenomenon occurs. On the one hand, gender systems can pose major problems for second language learners. On the other hand, young children tend to acquire the gender system of their native language without any major problems and make hardly any errors.

Gender classes can sometimes reflect a semantic category, relating properties of the elements of the class denoted by the noun and the grammatical gender. The most common characteristic expressed by gender is natural sex, followed by the contrast [± animate] and [± rational] (Corbett, op cit). Romance languages tend to have grammatical gender expressing the sex of a referent. Gender systems vary in the number of possible values that can be taken: while Romance languages in general have a two-value gender system, the Australian language Dyirbal and the Northeastern Caucasian language Tsez have a four-value gender system and the Bantu languages generally have between ten and twenty different genders reflected in a complex agreement system.

In spite of the fact that gender classes can sometimes reflect a semantic category, and, in fact, it is possible to say that gender classes might have originated on the basis of semantics, such motivation does not seem sufficient to provide a definition of gender (Name, 2002).

---

[4] The data collection for this study took place in Brazil. Since the phenomenon under investigation here does not differ between the varieties of Portuguese spoken in Europe and in Brazil, I will use the general term 'Portuguese'.

Arguably, gender is better defined on grammatical grounds. According to Mathews (1997, apud Corbett, 1991), gender can be defined as "a system in which the class to which a noun is assigned is reflected in the forms that are taken by other elements syntactically related to it". The word 'gender' derives etymologically from Latin 'genus', and originally meant 'kind' or 'sort'. Given the fact that nouns may be classified in various ways, there is some controversy about which types of noun classifications should count as gender marking. According to Corbett (op cit), the determining criterion of gender is *agreement*, i.e., in order to count as gender, the noun-classifying marking should be reflected beyond the noun itself. In other words, the grouping of nouns into different classifications should determine other forms beyond the noun. In a language like Russian, for example, adjectives have to change in form according to the classification of the noun, which demonstrates the existence of a gender system in this language. Other ways in which nouns can be classified, such as denoting versus not denoting insects — which is a valid criterion for gender agreement in the Caucasian language Archi — are not genders in Russian because they do not determine other forms beyond the noun.

2.1 Gender in the Minimalist Program

In the framework of the Minimalist Program (Chomsky, 1995), *agreement* is interpreted as a feature checking operation. Together with features of Person and Number, Gender is part of the group of phi-features (ϕ features). According to the proposal, ϕ-features can be either intrinsic or optional. Chomsky defines gender as an intrinsic feature in nouns and an optional feature in determiners, adjectives, for example. Under the minimalist framework, ϕ features are taken to be interpretable or non-interpretable, i.e., semantically read at linguistic and performance systems interface levels. Gender feature is considered to be [+interpretable] in nouns and [–interpretable] in determiners and adjectives. The [+interpretable] feature in nouns would guarantee its interpretability at interface levels. As will be shown in the next section, a proposal with such specifications seems to be somewhat problematic for languages such as Portuguese and other Romance languages (Name, op cit).

3 Gender in Portuguese

Like other Romance languages, Portuguese has a two-value gender system — nouns are either masculine or feminine. Further, Portuguese allows the possibility of the gender feature to be either intrinsic or optional, as exemplified below.

(a) Intrinsic: all inanimate nouns such as *carro* (car$_{masc}$) and *casa* (house$_{fem}$) and a few animate nouns such as *criança* (child$_{fem}$) -- but referring to both male and female children;

(b) Optional: there is correlation with natural gender (sex) and there is variation according to the referent of the DP, as in *menino* (boy$_{masc}$) and *menina* (girl$_{fem}$).

When intrinsic, the value of the gender feature would be specified in the lexicon entry and, when, optional, the value would vary, and the expression of such optionality would be morphological. The following table presents the classification of nouns in Portuguese with respect to the nature of the gender feature (adapted from Name, 2002).

Table 1 gender feature in nouns in Portuguese

Animacy	Optionality	
	Intrinsic	**Optional**
[-animate]	*mesa* (table$_{fem}$) *livro* (book $_{masc}$)	-
[+animate]	*girafa* (giraffe$_{fem}$) *crianca* (child$_{fem}$) *dentista* (dentist $_{masc}$/$_{fem}$) *colega* (colleague $_{masc}$/$_{fem}$)^5	*amigo/a* (friend $_{masc}$/$_{fem}$) *coelho/a* (rabbit $_{masc}$/$_{fem}$)

As regards interpretability of gender features, it seems problematic to assume that it is always [+interpretable] in nouns, since many nouns in Portuguese (and in other Romance languages) – can be semantically underspecified with respect to gender, such as those nouns with intrinsic gender (Name, op cit).

Even though the intrinsic gender of [-animate] nouns and some [+animate] nouns is arbitrary, there seems to be some phonological regularity in many languages, which allows generalizations to be made. This is also the case in Portuguese. There is a co-relational pattern between the phonological form of the noun and its gender (Corrêa & Name, 2003). Nouns ending in an unstressed *–o* ([u]) are usually masculine and nouns ending in *–a* are usually feminine. However, this is not always the case, and other noun endings are very frequent, such as *o planeta* (the$_{masc}$ planet $_{masc}$), *o problema* (the$_{masc}$ problem$_{masc}$), *a tribo* (the$_{fem}$ tribe$_{fem}$), *a foto*

---

^{5} Nouns like 'dentista' and 'colega' do not go through the morphological process of inflection, but they do require different gender marking in determiners and adjectives depending on the referent. A male dentist is, thus, referred to as 'o dentista', while a female dentist is referred to as 'a dentista'. It is not clear whether these nouns should be treated as two lexical entries with one intrinsic gender feature each or only one lexical entry with two intrinsic gender features.

(the$_{fem}$ photo$_{fem}$). Nouns ending in unstressed –*e* ([i]) or in consonants can be either masculine or feminine: *o dente* (the$_{masc}$ tooth$_{masc}$), *a ponte* (the$_{fem}$ bridge$_{fem}$), *o tambor* (the$_{masc}$ drum$_{masc}$), *a flor* (the$_{fem}$ flower$_{fem}$).

3.1 Gender inflection

According to Corrêa et al. (2004), gender inflection in Portuguese can be viewed as a process whereby the gender affix –*a* is added to a masculine base, causing alteration in meaning. There are different reasons for characterising the masculine form as an unmarked form and the feminine form as the marked one (Corrêa et al, op cit):

- from a morphological point of view: when nouns have an unstressed final thematic vowel –*o* or –*e*, the gender morpheme is added, causing the suppression of the thematic vowel, as in *gato/gat-a* (cat). When the noun has a word final stressed vowel, –*i* or –*u* as in *guri/guri-a* (boy/girl), or a consonant ending, as in *professor/professor-a* (teacher), the feminine gender morpheme is simply adjoined to the masculine base;
- from a semantic point of view: the masculine noun, either singular or plural, can be underspecified for natural gender both in generic and non-specific reference. Whereas *o*(s) *aluno*(s) may refer to both male and female student(s), *a*(s) *aluna*(s) can only refer to female student(s).

3.2 Gender in other elements of the DP

From a syntactic point of view, the gender of the noun controls agreement with syntactically related constituents. In Portuguese, agreement can be observed in the morphology of determiners, adjectives and participial forms. Gender is always manifest, both in singular and plural forms, in determiners and adjectives (those ending in – *o*) by an inflectional process that is initiated in the unmarked masculine form. Adjectives ending in – *e* are invariant.

Table 2 Morphological pattern of the Portuguese gender classes in the Determiners (adapted from Name, 2002)

	Masculine Determiners	**Feminine Determiners**
Definite articles	**o** (s) *	**a** (s)
Indefinite articles	um (ns)	um**a** (s)
Demonstrative pronouns	este/esse/aquele (s)	Est**a**/ess**a**/aquel**a** (s)

* (s) stands for the number morpheme marking plural

Within the category D, the feminine subset presents phonological regularity in the ending (-*a*). This regularity is similar to the endings of many nouns and inflected adjectives. On the other hand, not all forms of masculine determiners present phonological similarity with endings on nouns and adjectives.

Gender inflection in nouns and adjectives involves different morphological processes. The inflectional process that gives rise to gender-inflected nouns is strictly lexical, i.e., the feminine gender affix adds to animate nouns *semantic information* concerning a subset of the members of the class denoted by the unmarked masculine form (i.e., the subset of female individuals). Gender inflection in adjectives, in contrast, is the morphological expression of the syntactic process of *agreement*.

4 Gender acquisition in typically-developing children

As has been stated previously, the acquisition of gender systems tends to evolve smoothly for typically-developing children. The few studies that have been carried out so far suggest that typically-developing children acquire the gender system of their native language early in the process of language acquisition and that relatively few mistakes occur. In addition, these studies generally assume that grammatical gender is somewhat idiosyncratic and that its acquisition depends on general learning processes, based on frequency, phonological cues and semantic patterns, but not dependent on a syntactic mechanism (Mills, 1985; Karmiloff-Smith, 1979, and others).

More recently, an alternative account of normal gender acquisition in Portuguese has been proposed by Corrêa and Name (Corrêa, 2000b; Name & Corrêa, 2001; Name, 2002; Corrêa & Name, 2003). They argue that the acquisition of the gender system is fundamentally dependent upon computational operations. Taking into account that, within the Determiner Phrase, the category of Determiners is the most consistent in terms of phonological regularity, their working hypothesis is that children acquiring Portuguese identify morpho-phonological variation related to gender within the closed class of the Determiner and that the parsing and the delimitation of morphologically marked gender classes would then "bootstrap" the operation of the linguistic system as far as agreement with the DP is concerned, enabling the gender of the Determiner to be assigned to the Noun. This hypothesis presupposes early discriminatory abilities and the availability of the functional category Det at an early age.

5 Gender agreement abilities in children with SLI

Very few studies of gender agreement abilities in children with SLI have been carried out. Silveira (2002) presents a preliminary evaluation of gender agreement abilities in Brazilian children with SLI[6]. Four children that matched the criteria for SLI participated in the study (mean age 7;0) and results showed major differences in the performance of children with SLI and the typically-developing children[7] in many of the tasks administered. Specifically, the children with SLI presented problems in the comprehension and production of gender agreement in the DP. Such problems occurred both in tasks that used known nouns and in tasks that used novel nouns (exploring the assignment of gender to recently-learned nouns). The children performed less well on the production tasks than on the comprehension tasks[8].

Haeusler (2005) made use of a revised version of the test MABILIN to identify possible cases of children with SLI for her investigation of argument omission in this population. The use of this test gave rise to some interesting utterances produced by the children with SLI[9]. Different types of errors were identified: wrong gender marking in the adjective, such as 'uma porca gordo' [a_{fem} pig$_{fem}$ fat$_{masc}$], wrong gender marking in the determiner and the adjective such as 'um raquete preto' [a_{masc} racket$_{fem}$ black$_{masc}$], and wrong gender marking on the determiner, such as 'um banana' (a_{masc} banana$_{fem}$). On a task that used novel nouns,

---

[6] Dissertation which was part of a large research project at the Psycholinguistic and Language Acquisition Laboratory (LAPAL) at the Catholic University of Rio de Janeiro and was financed by FAPERJ. The project aimed to devise a language abilities test referred to as MABILIN (Módulos de Avaliação de Habilidades Psicolingüísticas). This test is in the process of being standardized and comprises a series of different modules. Module 1 comprises tasks that explore processing abilities dependent on syntactic operations and Module 2 involved tasks that deal with morphosyntactic abilities, exploring the identification and use of morphological marker of agreement operations.

[7] Investigations with the four children that matched the criteria for SLI were treated as a series of single case studies, due to the fact that the small number of subjects did not permit treatment as a group for statistical analysis.

[8] Since tasks were devised to be part of a broad language abilities test, they are not full experiments, mainly in the sense that not many items were included in each condition. Results can, therefore, show only tendencies and their interpretation need to be cautious.

[9] The data to be reported in this section refer to two children (WM and FR) that later participated in the current study.

several incorrect responses were reported, including mainly utterances with bare nouns[10].

Anderson and Souto (2005) carried out a study that sought to evaluate the pattern of article use by a group of Spanish-speaking children with SLI between the ages of 4;3 and 5;4, compared with age-matched controls, and paid considerable attention to gender marking. The Spanish gender system is very similar to the system in Portuguese. In speech samples obtained through picture description, narrative story telling and play interaction situation, gender errors accounted for 9.5% of the SLI group's non-target responses, which also included article omissions and number errors. The percentage of gender errors made by the group of age-matched typically-developing children was reported by the authors as minimal, but the exact numbers were not provided. With respect to the children with SLI, the authors performed further analysis in order to try and identify patterns of gender errors according to noun ending (typical versus non-typical) and to what was referred to as the noun's semantic transparency (animate versus inanimate). 42% of the gender errors were due to the use of a feminine article when the noun was masculine, whereas 58% of the errors resulted from the use of a masculine article with a feminine noun. 40% of the non-target responses occurred with [+animate] nouns and 60% of the errors referred to [-animate] nouns. With respect to noun endings, 70% of the errors were with typical endings, while 30% occurred with nouns with non-typical endings.

In addition, Anderson and Souto report results obtained in an experimental task in which the production of DPs was elicited. These data will not be reported here because the task contained several methodological problems which seem to have distorted the results. Interestingly, though, Anderson and Souto report some curious inconsistency with respect to gender errors, which emerged because the experimental task provided for two productions with the same target noun. For example, the noun 'tenedor' [fork$_{masc}$] was used, by the same child, correctly and incorrectly. This gender shifting behaviour, if confirmed in future studies, seems quite intriguing. According to Name (2002), there is no evidence of such fluctuation in studies of gender acquisition of typically-developing children. In other words, normally-developing children do not seem to produce correct and incorrect instances with the same noun concomitantly, in the same period of time.

Additional data on article use by Spanish-speaking children with SLI are found in Restrepo & Gutiérrez-Clellen (2001). Narrative and spontaneous speech samples were collected from a group of 5 to 7-year-old children with SLI. Their

---

[10] The words used on the task are all non-words in Portuguese and conform with the phonological characteristics of the language.

performance was contrasted to that of a group of age-matched controls. The most frequently occurring error was that of gender.

Jakubowicz and Roulet (to appear) report the results of a study on elicited production and perception of gender agreement conducted with 18 French-speaking children with SLI (mean age 8;9, SD 1;4) and a group of 18 typically-developing children (mean age 6;6, SD 0;1). The authors sought to find out whether or not inconsistent use of grammatical morphemes by children with SLI was the result of a syntactic deficit. Specifically, they wanted to know whether gender commission and omission errors made by children with SLI result from deficits in feature recognition — as in the 'feature blindness' account proposed by Gopnik (1990) — or from the absence or impairment of the operation Agree — as proposed by Clahsen (1989; 1997).

On the production task, pictures were presented to the child, who was asked to answer the question 'What do you see in this picture?'. The expected response, within this context, is a DP headed by a singular feminine or masculine indefinite article depending on the gender of the target noun. No single error was produced by the typically-developing children. The children with SLI, on the other hand, omitted 12.6 % (SD 20.3) of determiners and produced 5.0 % (SD 8.3) of gender agreement errors. Considering the ease of the task and the fact that the nouns used are usually acquired very early, the number of incorrect responses in the SLI group is quite high. An error analysis showed that agreement errors were relatively more frequent for feminine nouns (child produces 'un' [a_{masc}] instead of 'une' [a_{fem}]) than for masculine nouns (child uses 'une' [a_{fem}] instead of 'un' [a_{mas}]).

On the perception experiment, Jakubowicz and Roulet used a semantic categorisation task in which children had to decide if what they heard belonged or not to the semantic category indicated by the experimenter. Two conditions were considered: a gender matching condition and a gender mismatching condition. For example, children had to say, by pressing a button as quickly as possible, if 'pantalon' [pair of trousers] and 'cravate' [tie] are items of clothing. Nouns were preceded either by an article matching with it in gender or an article with a mismatching gender. Nouns were selected taking into account the predictive value for gender of the noun ending. The main reasoning underlying this task is the idea that mismatching DPs, if perceived, would cause longer response times (RTs). If incorrect agreement or omission of determiners characteristic of children with SLI were due to a selective impairment in establishing agreement relations, these children would behave differently from the typically-developing ones not only in the production task but also in the perception task. An agreement effect in the perception task would only be present for the typically-developing children. Results show that decision latencies were faster in the agreeing condition than in the disagreeing condition, for both the children with SLI and the typically-developing

children. In addition, the children with SLI were faster than the typically-developing children in both conditions. These results suggest that both groups of children were sensitive to gender agreement. An analysis of the categorisation errors shows that their distribution was not random: the mean number of errors was higher in the incorrect agreement condition than in the correct one for both groups of children and no between group differences were observed. A post-hoc analysis was carried out to determine whether categorisation errors varied in relation to the predictive value of the noun ending. It was observed that although this factor had no effect, it interacted with the agreement factor. For both groups of children, DPs with nouns whose endings are of low predictive value gave rise to more categorisation errors in the incorrect agreement condition than in the correct one. In addition, an individual analysis of the children with SLI did not reveal any specific pattern or relation between what they did in the production task and their sensitivity to mismatching in the semantic categorisation task. The authors argue that, with respect to the phenomena considered in the study, children's performance on production does not constitute a reliable reflection of the state of their grammatical competence. They conclude that children with SLI do not suffer from feature-blindness or a break-down of the operation Agree. The results show, instead, that processing of agreement seems to be irrepressible and automatically calculated even though it is not required by the semantic categorisation task. Given these remarks, the authors suggest that the difference between the two groups of children "does not seem to lie in the properties and modes of functioning of the syntactic component of the language faculty. Rather, the difference seems to reside in the modes of functioning of systems that access the structural representations made available by the syntactic component but are external to this engine, the production system in particular".

6 This study
6.1 Rationale and Tasks

Four tasks were used to explore the knowledge of gender agreement and the use of determiners by Brazilian children with Specific Language Impairment. The performance of the children with SLI was compared to the performance of typically-developing children within the age range of 5 to 7 years.

   There are at least two potential reasons for gender-related problems in SLI. Badecker et al (1995) have provided evidence that different stages are involved in the processing of gender agreement. They reported a study with an Italian anomic patient who, in various naming tasks, showed intact ability to identify the grammatical gender of nouns that he could not produce. Such results suggest that

the retrieval of gender features does not necessarily require the retrieval of the phonological form of nouns.

It is possible that the difficulties of children with SLI with gender agreement in Determiner Phrases are actually generated by problems with retrieving the gender feature of nouns. Such problems would impact on the production and comprehension of correct agreement between Det and Noun.

Another possible cause for difficulties children with SLI have with gender is a problem with agreement per se.

The experiments reported in the next section are a first attempt to investigate these alternatives and to provide a preliminary evaluation of abilities related to gender agreement. Experiment 1 is a gender categorisation task; Experiment 2 is an elicited production task that looks at gender agreement between Det and Noun in isolated DPs; Experiment 3 explores metalinguistic abilities of grammaticality judgement; and Experiment 4 is an elicited production task that explored gender agreement with adjectives in predicate position.

6.2 Participants
6.2.1 Children with SLI

Approaches to recruit children with SLI were made in different language units in Brazil, amongst private speech and language therapists' clinics, public units, university clinics and mainstream schools with an in-house therapist. Up to this stage, 4 children have been selected[11]. All the children undertook an audiometrical test to rule out hearing problems and the non-verbal part of the Brazilian version of the WISC (Wechsler Intelligence Scale for Children) to measure their non-verbal cognitive abilities. All the children passed the hearing test and scored greater than one standard deviation below the mean on the WISC test (i.e. a standard score greater than 85).

In addition to the WISC, children were administered the language test referred as 'MABILIN', devised by the Psycholinguistic and Language Acquisition Laboratory at PUC-Rio (see section 5).

Details of SLI children's age at first testing and scores on the WISC are presented below[12].

---

[11] The difficulty in finding children with the profile of SLI is partially due to the fact that many speech and language therapists in Brazil are not aware of the possibility of a language disorder existing in the absence of general cognitive delay. As a consequence, erroneous diagnoses are frequent and children with an SLI profile are often misdiagnosed, as having, for example, general learning disabilities at school or attention deficit disorder, resulting in inappropriate remediation.

[12] A brief comment about the social and educational background of the children with SLI needs to be made. The children WM, FR and JM come from working class, non-educated families, whereas the child GA comes from a middle class, educated family. In principle, their linguistic

Table 3 Details of SLI participants' age at first testing, and scores on non-verbal test

Code	Age	WISC
WM[13]	7;03	108
FR	6;01	106
JM	9;01	89
GA	7;06	98

6.2.2 Control group

The performance of the children with SLI is compared to that of typically developing children from 5 to 7 years-old, who were selected to have no history of speech and language disorder, and no history of hearing impairment. Up to this stage, all the typically-developing children that have been tested come from working class, uneducated families. These children were recruited in public schools in the city of Rio de Janeiro.

7. Experiments
7.1 Experiment 1

This experiment aims to assess whether children with SLI are able to retrieve the gender of nouns, by classifying inanimate nouns into different groups based on their gender. This experiment consists of a 2 (gender of the noun -- masculine or feminine) by 2 (presence of typical ending -- present or absent) design. Examples of the four conditions are shown below:

1) Masculine gender and typical ending (10 items)
   - e.g. barco (boat$_{masc}$)
2) Masculine gender and non-typical ending (10 items)
   - e.g. jornal (newspaper$_{masc}$)

---

abilities should not differ on the basis of their background. However, given the remarkable social and educational gap within the Brazilian context, it may be argued that these children differ with respect to certain cognitive abilities dependent on the type and amount of stimuli received at home and at school. Since the present study uses behavioral tasks to investigate their linguistic abilities, and thus, inevitably, makes certain cognitive demands, care must be taken when selecting the typically-developing children for the control group. Children with similar social and educational background to those of the children with SLI need to be assessed.

[13] Both WM and FR were part of Hauesler's study (Hauesler, 2005).

3) Feminine gender and typical ending (10 items)
    - e.g. banana (banana$_{fem}$)
4) Feminine gender and non-typical ending (10 items)
    - e.g. ponte (bridge$_{fem}$)

The predictions for this task are as follows:

1) If the difficulties SLI children present with gender are due to a syntactic problem, and not with the retrieval of the gender feature, children will able to sort out the nouns depicted on the cards;

2) If the difficulties SLI children present with gender are due to a pre-syntactic problem, it can be argued that they will have difficulties in grouping the nouns depicted on the cards into the baskets appropriately;

Stimuli

Forty nouns grouped into the four experimental conditions described above. All the nouns were controlled for age of acquisition[14] and they all designate concrete objects so that children could easily associate them with the related picture.

Materials
  . 2 baskets
  . 32 picture cards for the practice session
  . 40 picture cards depicting 40 different test nouns, divided into 4 groups (see conditions section above)

Procedure

Children were invited to play a game with the experimenter. A total of 72 cards (comprising practice and experimental sessions) was placed on the table. The experimenter showed the cards and baskets to children and said that they would need to put cards into two different baskets. As the task of categorising nouns based on their gender is very abstract, a thorough practice session (comprising 4 stages) was carried out prior to presenting the experimental task. Initially, very concrete examples were used to orientate the child's mind to the task of grouping/categorising the stimuli into two groups. The first set of cards varied between the categories "items of clothing" and "fruit". The experimenter started the session by saying "This is a pear. So we are going to put this card in this basket because a pear is a fruit. How about this t-shirt? Is it a fruit? No, it is an item of

---

[14] Since there is no extensive database on age of acquisition of lexical items in Portuguese, the Spanish version of the Macarthur-Bates Communicative Development Inventories was used, as Spanish is the closest language to Portuguese.

clothing, so we are going to put it in this other basket." Four similar items followed. The second practice session presented pictures of round and square objects and children had to categorise them according to shape. The third stage of the practice session required children to categorise the cards into groups of blue objects and red objects. Children had to succeed on each practice session before moving onto the next one. In the final practice session, the experimenter announced that a language game would start and the child was shown how to group the cards according to the gender of the noun depicted. This was done by the experimenter modelling the first trials, as follows: "This is a bicycle. We are going to put it in this basket because it is *a bicicleta* (the$_{fem}$ bicycle$_{fem}$)". Similar trials followed and a total of 12 cards were available in this final practice session. After the practice session, the actual experiment took place, and the child was asked simply to continue in the same way. The order of presentation of the cards was pseudo-randomized so that not many nouns of the same gender appeared in a sequence. The use of both nouns with typical ending and nouns with non-typical ending rules out the possibility of children performing the task based solely on the phonological properties of the nouns' ending.

Results

Table 4 shows the performance of individual SLI children. ✔ means the child was able to do the experiment and ✘ means the child did not do the experiment properly.

  Up to this stage, 14 typically-developing children between the ages of 5 and 7 years (mean age 7;06) have been tested.

Table 4 Performance of individual SLI children (referred by their initials) and control children (referred by 'td') in categorisation task

Children with SLI		Typically-developing children	
WM	✔	TD1	✘
FR	✘	TD2	✘
JM	✘	TD3	✘
GA	✘	TD4	✘
		TD5	✔
		TD6	✔
		TD7	✔
		TD8	✔
		TD9	✔
		TD10	✔
		TD11	✔

		TD12	✔
		TD13	✔
		TD14	✔

Children either understood the criteria required for categorising the nouns, and did the task without any problems, or they did not manage to understand the criteria and grouped the cards randomly. If children failed to understand the criteria and continued to respond randomly during the test session, the experiment was interrupted. Therefore, results are computed on the basis of criteria understanding, and not on the basis of the number of correct responses, as it was previously planned. The table above shows that only one of the children with SLI (WM) was able to do the task. Still, this was only possible after a few unsuccessful trials. The 3 other children with SLI (FR, JM, GA), even after several trials, were not able to understand the criteria required for the task. More typically-developing children need to be tested, but preliminary results suggest that only children from the age of 6 (TD5 to TD14) onwards are able to do the task. The 5 year-old children (TD1 to TD4), even after a couple of trials, did not seem to understand the criteria.

Discussion

Originally, Experiment 1 was conceived with the purpose of creating a context for the child to show knowledge of a noun's gender without having to produce any noun, and, thus without necessarily having to access the noun's phonological form. As children obviously cannot be asked explicitly about the gender of particular nouns — as was done with the adult aphasic patient mentioned on 6.1 — an indirect way of doing this had to be devised. It turned out, however, that the task contained a higher than expected level of metalinguistic demand. It can certainly be argued that the difficulties three of the children with SLI and the 5 year-old typically developing children had with this task were caused by immaturity of metalinguistic abilities. For some reason, these children were not yet able to think about language as well as they use language. Here it is important to note that children with SLI do use correct gender agreement in many spontaneous utterances, so it is definitely not the case that these children's grammar does not contain gender features at all.

   In addition, as mentioned in the procedure section, a practice phase with the use of concrete ways of categorising pictures was carried out before the testing phase. The use of this practice phase, nonetheless, may have served the opposite function. When noticing some children were not grouping the nouns correctly on the basis of their gender, the experimenter asked the child to say why he or she had put a card in a particular basket. In some instances, the child's response suggested that he or she was still grouping the cards based on the more concrete criteria previously used

in the testing phases. For example, when grouping a card depicting a bicycle (a_{fem} bicicleta$_{fem}$) some children would say it belonged to a certain basket because it was blue.

Interestingly, however, the age of the children with SLI is either the same (in the case of FR) or higher (in the cases of JM and GA) than the average age of the typically-developing children who managed to do the task. So, independently from the methodological problems which obscure findings on gender itself (mainly high load of metalinguistic abilities load), three of the children with SLI showed a behaviour that was not characteristic of their age peers.

7.2 Experiment 2

Experiment 2 is an elicited production task that investigates the production of gender agreement in isolated DPs. As Brazilian Portuguese is quite flexible with respect to allowing bare nouns, a context in which the most natural response would be a noun preceded by an article was created. This experiment consists of a 2 (gender of the noun -- masculine or feminine) by 2 (presence of typical ending -- present or absent) design. Examples of the four conditions are shown below:

1) masculine gender and typical ending (10 items)
   - e.g. o martelo (the$_{masc}$ hammer$_{masc}$)
2) masculine gender and non-typical ending (10 items)
   - e.g. o coração (the$_{masc}$ heart$_{masc}$)
3) feminine gender and typical ending (10 items)
   - e.g. a cama (the$_{fem}$ bed$_{fem}$)
4) feminine gender and non-typical ending (10 items)
   - e.g. a chave (the$_{fem}$ key$_{fem}$)

The same nouns as in Experiment 1 were used here[15]. In order not to have only the same nouns that had already been used in the previous experiment, 20 filler items were included. These items were used to test the production of number agreement and consisted of nouns with regular plural, which had been selected as distractors for the gender items. The pictures for the number items appeared as duplicate, in the same frame. The expected response in these cases is a Determiner and a Noun both marked for plural.

The predictions for this task are the following:

---

[15] This was due to the lack of feminine nouns without the typical ending "a" that are acquired early and are easily drawn.

1) As the current task offers a context in which the most natural response is a DP formed by a definite determiner and a noun, it is predicted that typically-developing children will not have any problems with the task;

2) The children with SLI, on the other hand, are likely to omit determiners in some instances, as determiner omission has been extensively reported in the literature (Vinkler & Pléh, 1995; Bottari et al., 2001; Leonard, 1998);

3) The children with SLI are also expected to produce some utterances with gender mismatch between determiner and noun, as has been reported in Silveira (2002) and Jakubowicz and Roulet (to appear).

Stimuli
Same as Experiment 1

Materials
  . a laptop computer (PowerPoint presentation)
  . 60 sets of 3 pictures each (1 target and 2 "distractors") — 40 sets for test items and 20 sets for filler items
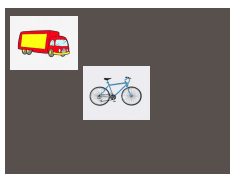
Procedure
Pictures were presented to the children on a computer using a PowerPoint presentation and animation accordingly. The child was shown three pictures at a time on the computer screen and was told that one of the pictures would then disappear.
  The experiment was carried out as follows:
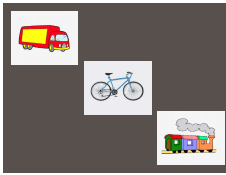
- *On screen* – picture 1 [experimenter introduces it; for example, "Aqui tem um caminhão" ("Here there is a truck")];
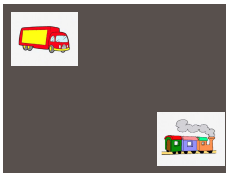
- *On screen* – pictures 1 & 2 [experimenter introduces picture 2; for example, "Aqui tem uma bicicleta" ("Here there is a bicycle")];

- *On screen* – pictures 1, 2 & 3 [experimenter introduces picture 3; for example, "E aqui tem um trem" ("And here there is a train")];

- *On screen* – pictures 1 & 3 [the target picture vanishes (in this case, picture 2, the bicycle) and child is asked to tell the experimenter which one has disappeared].

The appearance of each set of images and the vanishing of the target picture was controlled by the experimenter, so the experiment proceeded at the child's pace. By the time the child answered, both participants in the speech act (the child and the experimenter) were supposedly familiar with the picture denoted by the noun. Thus, the most appropriate response was a noun preceded by a definite article.

Results

Table 5 shows the percentage of correct responses obtained by typically-developing children and the individual cases of children with SLI. Up to this stage, 10 typically-developing children have been tested (mean age 6;3). Responses were scored as correct if the utterance produced by the child contained a noun preceded by an article (either definite or indefinite), marked correctly for gender.

Table 6 presents the percentage of use of an indefinite article instead of a definite article.

Table 5 Percentage of correct responses of control children and individual SLI children (referred by their initials) in the production of isolated DPs (production of article, definite or indefinite, marked for correct gender)

Typically-developing children (N=10)	Children with SLI			
	WM	**FR**	**JM**	**GA**
89% (SD 13.2)	97.5%	80%	37.5%	82.5%

Table 6 Percentage of production of indefinite articles of control children and individual SLI children (referred by their initials)

Typically-developing children (N=10)	Children with SLI			
	WM	**FR**	**JM**	**GA**

11.5% (SD 15.8)	50%	52.5%	7.5%	40%

Table 5 shows that, as regards determiner omission and gender agreement errors, only child JM performed more poorly than the typically-developing children. A few gender agreement errors was produced by the children with SLI, such as 'a balde' [the$_{fem}$ bucket$_{masc}$], produced by GA, and 'a tomate' [the$_{fem}$ tomato$_{masc}$], produced by JM. No such error was produced by the typically-developing children.

As can be seen on table 6, WM, FR and GA produced many more indefinite articles than definite articles than the typically-developing children. Recall that the most natural response expected for this experiment was a DP formed by a definite article and a noun, since all three pictures that could potentially disappear from the computer screen had been previously introduced with a DP formed by an indefinite article and a noun.

Discussion
Contrary to what had been predicted on the basis of studies evidencing article omission in SLI across languages, only child JM performed below the typically-developing children as regards the production of articles. The three other children with SLI performed in a similar fashion to the typically-developing children. The unexpected finding of a high number of indefinite articles instead of definite articles might be more informative. It could be argued that the children with SLI copied what they had just heard, i.e., the utterance used by the experimenter to introduce the pictures, formed by an indefinite article and a noun. This may explain the apparently low rate of absolute omission. Interestingly, all 4 children with SLI showed some sort of difficulty with the current task. The child JM omitted a high number of articles, while the other 3 children (WM, FR and GA) produced many more DPs with an indefinite article instead of the expected DPs with a definite article.

As regards the errors of gender agreement, the fact that the children with SLI produced some utterances in which there was a mismatch between the gender of the article and the gender of the noun — while the typically-developing children produced no errors of this type — is interesting. Nevertheless, the copying procedure outlined above might have played a role here too, preventing the children with SLI from making more mistakes.

7.3 Experiment 3

The current experiment involved a grammaticality judgement task. Even though grammaticality judgement tasks demand abilities of a metalinguistic nature, requiring, therefore, caution when interpreting results — they can be informative to

a certain extent about children's sensitivity towards morphological distinctions if they reveal patterns of errors.

The aim of the current experiment is to test children's ability to detect gender violation between the determiner and the noun in a DP. Three independent variables were manipulated: gender of the noun (masculine or feminine); presence of typical ending (present or absent); grammaticality (noun and determiner gender matching or mismatching), creating the 8 conditions below:

1) masculine gender in the noun, typical ending and gender matching (10 items)
   - e.g. o osso (the$_{masc}$ bone$_{masc}$)
2) masculine gender in the noun, typical ending and gender mismatching (10 items)
   - e.g. a garfo (the$_{fem}$ fork$_{masc}$)
3) masculine gender in the noun, non-typical ending and gender matching (10 items)
   - e.g. o sol (the$_{masc}$ sun$_{masc}$)
4) masculine gender in the noun, non-typical ending and gender mismatching (10 items)
   - e.g. a sorvete (the$_{fem}$ ice-cream$_{masc}$)
5) feminine gender, typical ending and gender matching (10 items)
   - e.g. a mochila (the$_{fem}$ rucksack$_{fem}$)
6) feminine gender, typical ending and gender mismatching (10 items)
   - e.g. o laranja (the$_{masc}$ orange$_{fem}$)
7) feminine gender, non-typical ending and gender matching (10 items)
   - e.g. a colher (the$_{fem}$ spoon$_{fem}$)
8) feminine gender, non-typical ending and gender mismatching (10 items)
   - e.g. o nuvem (the$_{masc}$ cloud$_{fem}$)

There are no previous results that allow for precise predictions. Some studies on metalinguistic abilities in children with SLI, however, indicate that their performance on these tasks is not as accurate as the performance of typically-developing children (cf. Kamhi and Koenig, 1985; Rice, Wexler and Redmond, 1999; Maillart and Schelstraete, 2005).

Stimuli
These were the same nouns as in Experiments 1 and 2, combining with determiners to form DPs. Each noun was presented twice, once in the grammatical condition and once in the ungrammatical condition. Half of the nouns were first presented in the grammatical condition while the other half was initially presented in the

ungrammatical condition. Otherwise, order of nouns was randomised. In total, 80 utterances (40 grammatical and 40 ungrammatical) were presented to each child.

Materials
This experiment made use of the experimental programme E-prime (Schneider et al, 2002), installed on a Compaq nx9010 computer. The presentation of the auditory stimuli and the management of the visual devices were conducted by an E-prime script generated for this experiment. The auditory stimuli for this experiment were recorded by two female native speakers of Portuguese. The entire recording took place in a sound-proof room.

Procedure
As in the other experiments, children were invited to play a game. The stimuli were presented on a laptop computer as part of a game that has two dogs (a blue one and a red one) as its main characters. Children had to judge whether an utterance spoken by one of the dogs was correct or not. As some of the children that took part in this study were quite young at the time of testing, the instructions given to them had to be appropriate. The experimenter told the child to say, by pressing one of two buttons[16], if the dogs said something that "sounds right" or something that "sounds strange". If the child thought the dog said something that "sounds right", the dog got a reward (which varied, according to the dog, between a bone and a bowl of water). If the child thought the dog had said something that "sounds strange", the dog would then produce a sound showing unhappiness. The experiment had three parts – an introduction, a practice phase and an experimental phase. The appearance of each image on the computer screen was controlled by the experimenter, so that the experiment proceeded at the child's pace. The blue dog was always on the left hand side of the screen and the red dog was always on the right hand side. Matching and mismatching utterances were allocated to the two dogs in random order. The experiment was carried out as follows:

- **On screen –** *blue dog sitting and red dog sitting*

Experimenter: 'This is a game with two dogs – a blue dog and a red dog. These dogs are learning how to speak! Do dogs speak? No, that is right. But these dogs are learning and because they are learning, they will speak in a funny way sometimes. You need to tell me when they are speaking in a funny way.'

---

[16] The button for "correct utterances" had a sticker with a "smiling face" on it and the button for "incorrect utterances" had a "sad face" on it. Children were instructed on how to use the buttons. In general, children had no problems in sorting the buttons.

- **On screen –** *blue dog standing and red dog sitting*

Experimenter: 'When the blue dog is talking he will stand up and he will tell you something. The red dog will be sitting.'

- **On screen –** *red dog standing and blue dog sitting*

Experimenter: 'The same will happen with the red dog. When the red dog is talking he will stand up and he will tell you something. The blue dog will be sitting.'

- **On screen –** *blue dog licking a bone and barking and red dog standing*

Experimenter: 'When the blue dog speaks and you think that he said something that sounds right, he will be rewarded with a bone and bark! Listen!'

- **On screen –** *red dog drinking water from a bowl*

Experimenter: 'When the red dog speaks and you think that he said something that sounds right, he will be rewarded with a bowl of water and drink from it. Listen!'

- **On screen –** *red dog and blue dog sitting*

Experimenter: 'When you think that what the dogs said sounds strange, they will get a bit upset and they will whine. Listen!'

- **On screen –** *red dog and blue dog sitting*

Experimenter: 'Let's see how it works?'

Results

Table 7 below presents the percentage of correct responses. Until the current stage, 7 typically-developing children have been tested (mean age 6;78).

Table 7 Percentage of correct responses of control children and individual SLI children (referred by their initials) in the grammaticality judgement task

Typically-developing children (N=7)	Children with SLI			
	WM	**FR**	**JM**	**GA**
93.4% (SD 3.73)	97.5%	47.5%	58.75%	71.25%

Table 7 shows that 3 children with SLI performed more poorly than the typically-developing children. One child with SLI, WM, was not successful when he was first administered the experiment, but he then managed to do it without problems. The children FR, JM and GA, even after a couple of trials, continued to perform poorly.

Discussion

As predicted, this task proved difficult for the children with SLI, with only one child succeeding. Note that WM, the child that succeeded on this task, was also the only one who managed to do Experiment 1.

Interestingly, the 3 children with SLI that had difficulties with this task also failed in answering questions put by the experimenter after the task was administered. When asked questions like 'When you say 'barco' [boat$_{masc}$], do you say 'o barco' [the$_{masc}$ boat$_{masc}$] or 'a barco' [the$_{fem}$ boat$_{masc}$]?' In all instances, the children with SLI (with the exception of WM, who succeeded on the task and, thus, was not asked further questions) provided an incomplete answer, producing a bare noun, without any articles, such as 'barco'.

Metalinguistic tasks involve cognitive demands in addition to linguistic knowledge. Therefore, it is not possible to be sure that the children with SLI that performed significantly less well than the typically-developing children fully understood what their task was. An analysis of the errors produced by these children, might, nevertheless, shed some light on the issue. If specific response patterns are identified, such as more incorrect answers in the condition with nouns with non-typical endings, this might suggest that children are less sensitive to violations involving a noun with non-typical ending. Preliminary analyses, however, do not seem to show such a tendency. Further data collection and analyses will hopefully provide a clearer picture as regards the SLI children's sensitivity towards gender violations.

7.4 Experiment 4

This experiment involved an elicited production task requiring gender agreement outside the domain of the DP, namely with adjectives in predicate position. As seen in section 5, very few studies have explored gender agreement with adjectives in children with SLI. In the case of adjectives, the gender feature has no independent content, being just a copy of the gender feature of the noun. One independent variable was manipulated: gender of the noun (masculine or feminine), creating the conditions below:

1) masculine gender
   - esse copo está cheio (this$_{masc}$ glass$_{masc}$ is full$_{masc}$)
2) feminine gender
   - essa camisa está suja (this$_{fem}$ shirt$_{fem}$ is dirty$_{fem}$)

There are no previous results that allow for precise predictions. The language samples provided on page 13, nevertheless, suggest that gender agreement in the adjective is an area of problems for children with SLI.

Stimuli
24 simple sentences with subject and an adjective in predicate position (12 masculine, 12 feminine, equally balanced for the two types of the verb "be" in Portuguese: "ser" and "estar")

Materials
Booklet with 2x12 pairs of pictures depicting "contrasting relations" (e.g. The shoe is dirty + The shoe is clean)
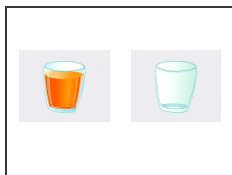
Procedure
As in the other experiments, children were invited to play a game. Each trial began with the experimenter producing a pair of sentences describing on one pair of nouns modified by contrasting adjectives. The child then was asked to produce sentences for the next pair of nouns, which always differed in gender from the nouns in the preceding pair described by the experimenter. This procedure is exemplified below:

Based on a pair of pictures like the ones below, the experimenter says:

- experimenter: essa garrafa está cheia (this$_{fem}$ bottle$_{fem}$ is full$_{fem}$)
  essa garrafa está vazia (this$_{fem}$ bottle$_{fem}$ is empty$_{fem}$)

Then, the child is asked to produce her utterances based on the next set of pictures, such as the ones below:

- child: esse copo está cheio (this$_{masc}$ glass$_{masc}$ is full$_{masc}$)
  esse copo está vazio (this$_{masc}$ glass$_{masc}$ is empty$_{masc}$)

Results

Children's scores were computed as percentages for correct gender marking out of total attempts of gender differentiated items[17]. 13 typically-developing children have been tested so far (mean age 6;4).

Table 8 Percentage of correct responses of control children and individual SLI children (referred by their initials) in the production of gender in the adjective

Typically-developing children (N=13)	Children with SLI			
	WM	**FR**	**JM**	**GA**
97.3% (SD 3.35)	66%	60%	95%	95%

Table 8 shows that the typically-developing children performed very well on this task. In addition, it shows that two of the children with SLI (WM and FR) performed much more poorly than the group of typically-developing children.

Discussion

This task proved difficult for two children with SLI (WM and FR). Four different tendencies were found in their results, which are not present in the results of the typically-developing children. In general, WM and FR produced more adjectives marked for masculine instead of adjectives marked for feminine than the reverse pattern. Corrêa et al (2004) provide data compatible with the view that masculine adjectives are represented as gender-unmarked forms in the mental lexicon. The tendency identified in the performance of WM and FR seems, therefore, to suggest the use of gender-unmarked forms more often than marked forms.

In addition, WM and FR produced some utterances with no determiner preceding the noun, as well as utterances with verb omission. Both types of omission are characteristic of the speech of children with SLI across languages. Moreover, these children produced many utterances in which an invariant adjective was used instead of the target one (see footnote 17 on page 23). By using an invariant adjective, these children avoid having to mark the adjective for gender. Further statistical analyses of the patterns identified are in progress.

---

[17] Children did not always produce the adjective that the experimenter tried to elicit. In some instances, they used alternative adjectives, of higher frequencies and earlier acquisition, like "grande$_{(neu)}$" (big). As long as the alternative adjectives children used were adjectives variable in gender (i.e. non-neutral), responses were considered scorable. The answers with a neutral adjective (i.e. gender invariant) were excluded from the scores, since they do not require any gender marking and so cannot be considered either correct or incorrect.

Some typically-developing children made a few unexpected mistakes. Due to the easiness of the task, the very fact that mistakes occurred seems surprising. No gender errors of the type registered here are found in spontaneous speech of typically-developing children, with the exception of extremely rare slip-of-the-tongue 'errors'. It can be argued they were caused by a methodological shortcoming of the task employed. Recall that the experimenter produced two utterances with the target adjective marked for the opposite gender right before the children's performance. This design might have led some children to merely copy the form of the adjective they had just heard.

7.5 Summary of findings

In spite of the low number of subjects tested so far, it is possible to identify some evidence of problems with gender marking in the tasks reported above. It is crucial to note the heterogeneity in the performance of the 4 children with SLI. For instance, the child WM was the only among the impaired children who managed to understand the criteria required in Experiment 1 and performed similarly to the typically-developing children in the grammaticality judgment task of Experiment 3. WM, nevertheless, performed extremely poorly in Experiment 4, the task of production of gender agreement in adjectives outside the DP. The child FR presented difficulties across tasks. He was not able to do Experiment 1, produced a large number of indefinite articles instead of definite ones in Experiment 2, performed at chance level when judging the grammaticality of utterances in Experiment 3 and made many gender errors in the adjectives of Experiment 4. The child JM also presented difficulties across tasks, with the exception of Experiment 4. She was not able to understand the criteria required in the categorisation task in Experiment 1, omitted articles in the majority of responses in Experiment 2 and performed poorly when judging the grammaticality of utterances in Experiment 3. Similarly to FR and JM, the child GA presented difficulties in Experiment 1 and in Experiment 3. GA also produced a large number of indefinite articles instead of definite ones in Experiment 2.

8. General discussion

The preliminary data reported here, taken together with results of other studies, particularly Silveira (2002) and Jakubowicz and Roulet (to appear) indicate that children with SLI present some problems with gender. Nevertheless, the data also reveals that, in spite of encountering problems with gender, these children do not

lack knowledge of gender completely, as they do show correct use of gender agreement and morphological marking in many instances. Furthermore, the results presented here show great variability among children with SLI. These results, however, are not conclusive with respect to whether such differentiated behaviour is a consequence of distinct selective problems among these children or a reflection of task-specific demands. Further research is in progress, which is investigating other aspects of gender-related abilities, including the assignment of gender to novel nouns. Future work should elucidate some of the questions raised here.

References

Anderson & Souto (2005) The use of articles by monolingual Puerto Rican Spanish speaking children with specific language impairment. *Applied Psycholinguistics 26*: 621 – 647.

Badecker, W., Miozzo, M. & Zanuttini, R. (1995) The two-stage model of lexical retrieval: evidence from a case of anomia with selective preservation of grammatical gender. *Cognition 57*: 193-216.

Bottari, P., Cipriani, P. Chilosi, A.M. & Pfanner, L. (2001) The Italian Determiner System in Normal Acquisition, Specific Language Impairment, and Childhood Aphasia. *Brain and Language 77*, 283-293.

Chomsky, N. (1981) *Lectures on Government and Binding*. Dordrecht: Forris.

Chomsky, N. (1986) *Knowledge of Language, its nature, origin and use*. New York: Praeger.

Chomsky, N. (1995) *The Minimalist Program*. Cambridge, Mass: The MIT Press

Clahsen, H. & Almazan, M. (1998) Syntax and morphology in Williams syndrome. *Cognition* 68: 167-198.

Clahsen, H. (1989) The grammatical characterization of developmental dysphasia. *Linguistics 27*, 897-920.

Clahsen, H., Bartke, S. & Göllner, S. (1997) Formal features in impaired grammars: a comparison of English and German SLI children. *Journal of Neurolinguistics 10*, 151-171.

Corbett, G. (1991) *Gender*. Cambridge. Cambridge University Press.

Corrêa, L.M.S. (2000a) *Categorias Funcionais e Processos Flexionais na Emergência da Linguagem e um Instrumental Psicolingüístico para o Diagnóstico de Manifestações Morfossintáticas do DEL*. Projeto FAPERJ.

Corrêa, L.M.S. (2000b). Uma hipótese para a identificação do gênero gramatical com particular referência para o português. Paper presented in the *V Encontro Nacional e I Encontro International sobre Aquisição da Linguagem*, Porto Alegre, 2-6 Oct.

Corrêa, L.M.S. (2005) On the processing of gender and number agreement in early language acquisition. Séminaires du Lundi, Laboratoire de Psychologie Expérimentale (LPE), Universite Paris V.

Corrêa, L.M.S. & Name, M.C (2003) The Processing of Determiner – Noun Agreement and the Identification of the Gender of Nouns in the Early Acquisition of Portuguese. *Journal of Portuguese Linguistics*, vol. 2, no. 1, 2: 19 – 43.

Corrêa, L., Almeida, D. & Porto, R. S. (2004) On the representation of Portuguese gender-inflected words in the mental lexicon. *Brain and Language* 90: 63-73.

Gopnik, M. (1990) Feature Blindness: A Case Study. Language Acquisition 1(2): 139 – 164.

Haeusler (2005) A Estrutura Argumental de Verbos na Produção Eliciada de Crianças com Queixas de Linguagem e Manifstações do Déficit Especificamente Lingüístico Dissertação de Mestrado. PUC-Rio.

Jakubowicz, C., Nash, L., Rigaut, C. & Gérard, C-L. (1998) Determiners and clitic pronouns in French-speaking children with SLI. *Language Acquisition* 7: 113-160

Jakubowicz, C. & Roulet, L. (to appear) Narrow syntax or interface deficit? Gender agreement in French SLI. In: J.M. Liceras, H. Zobi & H. Goodluck (Eds) The role of formal features in second language acquisition. Lawrence Erlbaum Associates.

Kamhi, A. & Koenig, L. (1985) Metalinguistic Awareness in Normal and Language-Disordered Children. *Language, Speech and Hearing Services in Schools 16*: 199 – 210.

Karmiloff-Smith, A. (1979) A functional approach to child language. A study of determiners and reference. Cambridge: Cambridge University Press.

Leonard, L. (1998) *Children with Specific Language Impairment*. MIT Press, Cambridge, Mass.

Leonard, L. & Bortolini, U. (1998) Grammatical Morphology and the Role of Weak Syllables in the Speech of Italian-Speaking Children with Specific Language Impairment. *Journal of Speech, Language and Hearing Research* 41: 1363-1374.

Maillart, C. & Schelstraete, M-A. (2005) Grammaticality judgment in French-speaking children with specific language impairment. Journal of Multilingual Communication Disorders 3: 103 – 109.

Mills (1985) The Acquisition of German. In: Slobin, D. I. (Ed.) The crosslinguistic study of language acquisition. Vol. I: The Data. Hillsdale: L. Erlbaum.

Name, M. C. (2002) *Habilidades perceptuais e lingüísticas no processo de aquisição do sistema de gênero no português*. Tese de Doutorado. PUC-Rio

Name, M. C. L, Corrêa, L. M. S. Young children sensitivity to determiners and the identification of the gender system in Portuguese. In: GALA CONFERENCE 2001 – Generative Approachese to Language Acquisition, 2001, Palmela. Gala. 2001. p.180-187.

Restrepo, M.A & Gutierrez-Clellen, V. (2001) Article use in Spanish-speaking children with Specific Language Impairment. *Journal of Child Language 28*: 433-452.

Rice, M.L., K. Wexler and P.L. Cleave, (1995) Specific Language Impairment as a period of Extended Optional Infinitive, *Journal of Speech and Hearing Research* 38: 850-863.

Rice, M. and Wexler, K. (1996). Toward Tense as a Clinical Marker of Specific Language Impairment in English-speaking Children, *Journal of Speech and Hearing Research* 39, 850-863.

Rice, M., Wexler, K., and Hershberger, S. (1998). Tense over Time: The Longitudinal Course of Tense Acquisition in Children with Specific Language Impairment. *JSLHR* 41: 1412-1431.

Rice, M.L., Wexler, K. & Redmond, S.M. (1999) Grammaticality judgements of an extended optional infinitive grammar: Evidence from English-speaking children with specific language impairment. Journal of Speech, Language and Hearing Research 42: 943 – 961.

Roulet, L. & Jakubowicz, C. (2004) Do gender errors and determiner omission in French-speaking children with SLI reflect an "Agreement" deficit? Poster presented at the Architecture of the Language Faculty, London, 4 May.

Silveira, M. (2002) *O Déficit Especificamente Lingüístico (DEL) e uma avaliação preliminar de sua manifestação em crianças falantes de português*. Dissertação de Mestrado, PUC-Rio.

Vinkler, Z. & Pléh, C. (1995) A case of a specific language impaired child in Hungarian. In M. Kovacevic (Ed.) Language and language communication barriers: Research and theoretical perspectives in three European languages (pp. 131-158). Zagreb: Croatian University Press.