Gender assignment strategies among simultaneous Spanish/English bilingual children from Miami, Florida

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Abstract: We examined gender assignment patterns in the speech of Spanish/English bilingual children, paying particular attention to the influence of three gender assignment strategies (i.e., analogical gender, masculine default gender, phonological gender) that have been proposed to constrain the gender assignment process in Spanish/English bilingual speech. Our analysis was based on monolingual Spanish nominals (n = 1774), which served as a comparative baseline, and Spanish/English mixed nominal constructions (n = 220) extracted from oral narratives produced by 40 child bilinguals of different grade levels (second graders vs. fifth graders) and instructional programs (English immersion vs. two-way bilingual) from Miami Dade, Florida. The narratives, available in the CHILDES database (MacWhinney, Brian. 2000. *The CHILDES project: Tools for analyzing talk*, 3rd edn. Mahwah, NJ: Lawrence Erlbaum Associates), were collected by Pearson, Barbara Z. 2002. Narrative competence among monolingual and bilingual school children in Miami. In D. Kimbrough Oller & Rebecca E. Eilers (eds.), *Language and literacy in bilingual children*, 135–174. Clevedon, UK: Multilingual Matters. Results revealed that in Spanish nominal constructions, children across both instructional programs and grade levels evinced native-like acquisition of grammatical gender. In mixed nominals, children overwhelmingly assigned the masculine gender to English nouns. Notably, irrespective of schooling background, simultaneous Spanish/English bilingual children used the masculine default gender strategy when assigning gender to English nouns with feminine translation equivalents. This suggests that from age seven, simultaneous Spanish/English child bilingual acquisition of grammatical gender is characterized by a predisposition towards the employment of the masculine default gender strategy in bilingual speech.

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1 Introduction

While gender assignment strategies (i.e., the analogical gender, the masculine default gender, and the phonological gender) in Spanish/English bilingual speech have been investigated in the naturalistic speech of adult bilinguals (e.g., Balam 2016a, 2016b; Clegg and Waltermire 2009; DuBord 2004; Jake et al. 2002; Otheguy and Lapidus 2003; Valdés Kroff 2016, among others), to our knowledge, no previous study has analyzed the use of these three strategies in the oral production of simultaneous Spanish/English bilingual children (ages 7;0–8;0 and 10;0–11;0). Endeavoring to fill this gap in the antecedent literature, we examined gender assignment in monolingual Spanish and mixed nominal constructions produced by simultaneous Spanish/English bilingual children from Miami Dade, Florida. While our primary interest concerned mixed nominal constructions, the children's monolingual Spanish nominals served as a comparative baseline for their knowledge and use of grammatical gender.

Grammatical gender assignment involves the union of lexical and syntactic aspects (Corbett 1991). At the lexical level, there is the process whereby nouns are *assigned* to one of two or more gender classes (e.g., masculine, feminine), with the gender feature stored as a node at the lemma level to which invidual nouns are linked within the Mental Lexicon (Levelt et al. 1999). At the syntactic level, there is the process of gender agreement where gender is marked across several constituents within the noun phrase (e.g., determiners, adjectives) in agreement with the head noun.[1] In the remainder of the article, the term gender assignment is used in a general sense when referring to both the lexical and syntactic processes. Where reference is made to matches and mismatches in gender agreement, we are inherently assuming the syntactic process.

In the study of Spanish/English contact phenomena, gender assignment has generated scholarly interest not only because of the tendency for nouns to be more frequently borrowed or switched (Jake et al. 2002), but also because this is one structural aspect in which Spanish and English differ. In Spanish, grammatical gender is manifested syntactically via agreement in the noun phrase (Montrul and Potowski 2007: 304). As (1) illustrates, there is gender agreement between the head

1 Within formal (i.e., minimalist) approaches to syntax, gender agreement is viewed as resulting from feature checking or matching processes across several constituents (Carstens 2000). However, a formalist analysis is beyond the scope our study.

noun and other sentential elements such as determiners (i.e., *las* 'the') and adjectives (i.e., *pequeñas* 'little'). English, on the other hand, lacks grammatical gender.

(1) *Estaba jugando con las ranitas pequeñas*
Be-3SG play-PROG with the-FEM.3PL frog-FEM.3PL little-FEM.3PL
'[The boy] was playing with the little frogs.'
(female, fifth grader, ID 2113236)[2]

It is well known that Spanish/English bilinguals routinely produce mixed nominal constructions, such as '*el* rock' in (2), where English nouns co-occur with a Spanish gender-marked determiner. To date, several studies have shown that adult Spanish/English bilinguals overwhelmingly assign the masculine default gender to English nouns (e.g., Balam 2016a; Otheguy and Lapidus 2003; Valdés Kroff 2016, but see Królikowska et al. 2019), but this has not been attested among simultaneous Spanish/English bilingual children (Liceras et al. 2008, 2016). Investigating the employment of gender assignment strategies among children is important as it elucidates our understanding of how child simultaneous bilinguals juggle elements from different languages vis-à-vis language-internal factors, cognitive considerations, and sociolinguistic norms as well.

(2) *'taba abajo del rock*
be-IMP underneath the.MASC.SG rock
'[The dog] was underneath the rock …'
(male, second grader, ID 12122132)

Several scholars have argued for the influential role of the analogical criterion (Jake et al. 2002; Liceras et al. 2008, 2016), in which the gender of English nouns is assigned according to the gender of the Spanish translation equivalent (e.g., el_{masc} deer [= el_{masc} $venado_{masc}$] and las_{fem} bees [= las_{fem} $avispas_{fem}$]). It has also been posited that the phonological criterion (Clegg and Waltermire 2009; DuBord 2004), or the terminal phoneme of an English noun, is more deterministic in the gender assignment process (e.g., an English noun ending in -r will favour the masculine gender, e.g., el_{masc} deer). Other researchers underscore the predominant role that the masculine default strategy plays when Spanish/English bilinguals assign gender to English nouns (e.g., Balam 2016a; Otheguy and Lapidus 2003; Valdés Kroff 2016).

2 All examples are from the oral narratives collected by Pearson (2002). For ease of readability, we have excluded CLAN symbols found in the original transcripts which we accessed on the CHILDES database (MacWhinney 2000).

As it relates to elementary school-age bilingual children, the use of these strategies raises multiple questions. Typically, monolingual Spanish-speaking children have been observed to acquire basic grammatical gender (especially determiner/noun agreement) by the age of three years (Anderson 1999; Hernandez Piña 1984; Montrul and Potowksi 2007), although as Mariscal (2008) observes, agreement between the noun and other agreement elements (e.g., demonstratives and adjectives) is acquired at a later stage. While some studies reveal that Spanish L1 gender acquisition is nearly error-free from an early age (e.g., Aguirre 1995), other studies have attested a stage (prior to age five) during which monolingual children produce different kinds of agreement errors (Hernandez Piña 1984; Mariscal 2008), resulting from a reliance on a noun's phonological form (feminine *-a* vs. masculine *-o* ending) rather than gender marking on the determiners. A masculine default strategy in gender assignment has also been attested as monolingual children prefer to assign masculine gender to irregular nouns involving ambiguous phonological cues (Pérez-Pereira 1991).

Previous research suggests that Spanish/English bilingual children exhibit protracted development in the acquisition of grammatical gender (Anderson 1999; Gathercole 2002; Shin 2018, but see Fernández Fuertes et al. 2016; Goebel-Mahrle and Shin 2020). A concomitant question that arises is how this differential pattern in acquisition impacts children's gender assignment patterns, particularly in bilingual speech. Specifically, is it the case that children also overwhelmingly employ the masculine default gender in mixed nominal constructions, as it has been found to occur across several adult Spanish/English bilingual populations?

Based on data from multiple studies, Liceras et al. (2008)[3] posit that "[C]hildren go through a stage where … they use both masculine and feminine Ds with English Ns without clearly favoring the masculine by default or the matching strategy [i.e., the analogical criterion]" (p. 845). Liceras et al. (2016) reiterate that while the abundance of masculine-marked mixed nominal constructions is well attested among children, there is no evidence that they clearly favour either the analogical criterion or masculine default gender when producing mixed nominal constructions. In Liceras et al.'s (2008: 846) formal terms, this occurs because children's mixed nominal constructions are non-specificed for the interpretable Gender Agreement F-feature in the determiner, and thus, no agreement is triggered between the determiner and the noun. Crucially, given that these conclusions are

3 Liceras et al. (2008) examined spontaneous and experimental data on grammatical gender from Spanish/English simultaneous bilingual children and adult L1 speakers of English, French and Spanish with different levels of proficiency in their respective L2s. In relation to children's spontaneous data, Liceras et al.'s focus was primarily on the language of the functional category rather than on gender assignment strategies.

based on data from children under the age of seven (Liceras et al. 2008, 2016), it remains unclear whether older children also exhibit this purported lack of preference in the use of a particular gender assignment strategy.

When analyzing bilingual children's speech, a factor that is especially relevant to their linguistic development is schooling, as their language experience in school may impact their language use (Gathercole 2002). When children enter school, there may be changes in terms of language use and linguistic competence in the minority language (Castilla-Earls et al. 2019; Montrul and Potowski 2007). Whereas children in two-way bilingual programs are immersed in contexts where the minority language is embraced, children in English-only classrooms have limited or no exposure to their home language.

A pertinent concern is whether children who are in a school environment that fosters the use of the minority language show differential gender assignment patterns in comparison to children who are in schools where this is not the case. Here we analyze data from second graders (ages 7;0–8;0) and fifth graders (ages 10;0–11;0) in two different programs in Miami, Florida; namely, those who were enrolled either in an English immersion program, where the medium of instruction was English (except for an optional half-hour per day in Spanish); or in a two-way bilingual program, where both languages were used as the medium of instruction (60% English and 40% Spanish) on a daily basis (Pearson 2002).

While previous research has explored gender assignment strategies in oral production among adult Spanish/English bilinguals from Miami, Florida (Valdés Kroff 2016), this study is the first of its kind to examine this phenomenon among simultaneous Spanish/English bilingual children from this Spanish/English context. The goal of the study was to examine children's overall gender assignment patterns in monolingual versus code-switched nominal constructions. Note that inclusion of the monolingual data was done to provide a comparative baseline to examine gender assignment patterns in bilingual discourse and to determine whether there was any pre-existing pattern in monolingual Spanish that could elucidate our understanding of how children use gender assignment strategies in mixed nominal constructions. In order to cast light on the employment of the masculine default gender strategy in bilingual speech, we examined how different strategies influenced the gender assignment process of English nouns with feminine translation equivalents.

2 Dual Immersion Schooling and the Acquisition of Grammatical Gender

Previous work has provided valuable insight into the important role that a dual immersion schooling experience has on the acquisition of grammatical gender

among Spanish/English bilingual children. Gathercole (2002) examined gender agreement in a sample of 294 Spanish/English bilingual children from the Miami Dade area.[4] Gathercole's study revealed that bilingual children's grammatical judgments evinced lower accuracy in gender agreement in comparison to monolingual Spanish-speaking children. Furthermore, second graders had a lower accuracy rate in their intuitions than fifth graders, particularly fifth graders in two-way bilingual programs. Gathercole concluded that greater exposure to input in Spanish, either in the home or school context, facilitated the acquisition of Spanish gender.

In line with Gathercole's study, Montrul and Potowski (2007) also highlighted how access to Spanish input, via dual immersion, influences the acquisition of grammatical gender. Montrul and Potowski (2007) conducted a cross-sectional analysis of gender assignment and gender agreement in the oral production of three groups of children (ages 6;0–11;0) attending a two-way immersion school in Chicago. Among other findings, their study revealed that heritage speakers of Spanish showed error rates above 5% with determiners in the narrative task and more than 30% with adjectives in the puzzle task. Importantly, older children (ages 9;0–11;0) were more accurate in their use of grammatical gender than their younger counterparts (ages 6;0–8;0). Overall, no evidence was found of language loss with increased age (but see Castilla-Earls et al. 2019, for decline in Spanish percentage of grammatical utterances with increased age), and this was attributed to the dual immersion school curriculum.

Extant research, thus, suggests that bilingual children's language patterns are affected by their schooling experience (Castilla-Earls et al. 2019; Gathercole 2002; Montrul and Potowski 2007). More specifically, children in higher grade levels with more exposure to Spanish generally show more accuracy in terms of grammatical gender assignment and/or agreement (but see Goebel-Mahrle and Shin 2020). What remains less understood, however, is how dual immersion schooling impacts bilingual children's employment of gender assignment strategies in bilingual speech, an issue we examine here.

3 Gender Assignment Strategies in Bilingual Speech

There are several strategies that have been argued to influence the gender assignment process in Spanish/English bilingual speech (Balam 2016a; Clegg and

4 Gathercole (2002) examined judgment data from the original sample of children. Here we examine narrative data from a sub-set of the original Miami Dade sample.

Waltermire 2009; Liceras et al. 2016; Otheguy and Lapidus 2003; Poplack et al. 1982; Smead 2000; Valdés Kroff 2016). While factors such as animacy (Balam 2016a; Otheguy and Lapidus 2003) and biological gender (e.g., DuBord 2004; Valdés Kroff 2016) do influence the gender assignment process in bilingual speech, we focus here on the linguistic criteria that are generally considered the most influential: the analogical gender, the masculine default gender, and phonological gender. Note that given the paucity of research on gender assignment strategies in the speech of Spanish/English bilingual children, we primarily outline findings that have been found in relation to oral production among adult simultaneous Spanish/English bilinguals.

3.1 Analogical Gender

The analogical criterion[5] (i.e., when the gender assigned to an English-origin noun is based on the gender of the Spanish translation equivalent) has been found to be an influential factor in mixed nominal constructions. Jake et al. (2002) examined oral production data from 10 Spanish/English adult bilinguals of South American background working in the U.S. or studying in U.S. graduate schools. In their examination of 151 noun phrases (NPs) consisting of gender-marked Spanish determiners and English nouns, they found that analogical gender was the strongest predictor of gender assignment. Whereas analogical gender accounted for 52% (78/151) of English-origin nouns, the phonological criterion only accounted for 23% (35/151) of mixed DPs. Consonant with Jake

5 The analogical criterion has been formalized as the *Gender Double-Feature Valuation Mechanism*, which accounts for the preference of Spanish determiners in switched DPs and the gender agreement that is enforced between the Spanish determiner and the Spanish translation equivalent of the (ungendered) English noun (Fernandez Fuertes and Liceras 2018; Liceras et al. 2008). Note, however, that our conception of the analogical gender differs from that held by Liceras and colleagues, who analyze examples such as *el plane* 'el$_{masc}$ avión$_{masc}$' as illustrative of the analogical masculine gender (see Fernández Fuertes and Liceras 2018: 178). In our view, mixed nominal constructions like *el plane* are unable to cast light on the analogical gender as they can be accounted for by the analogical masculine gender, the masculine default gender, or the phonological gender (for a more detailed discussion with examples, see Section 4.2). Distinguishing between the analogical masculine gender and the masculine default gender is particularly challenging in contexts like Northern Belize where the majority of Spanish-dominant Spanish/English bilinguals exclusively produce masculine-marked mixed nominal constructions in code-switched discourse (Balam 2016a: 22). Following Otheguy and Lapidus (2003), it could be argued that in the Northern Belize context, while the masculine/feminine gender distinction remains fully operative in monolingual Spanish nominal constructions, it is 'suspended' in bilingual discourse, and the default gender is consistently employed to optimize linguistic resources and facilitate code-switching.

et al.'s findings, in more recent work, adherence to the analogical criterion has also been found among simultaneous Spanish/English adult bilinguals from Gibraltar (Liceras et al. 2016: 122); El Paso, Texas (Królikowska et al. 2019); and New Mexico (Rodríguez-González et al. 2019).

In the case of children, the application of the analogical criterion is less clear. Previous work suggests that Spanish/English simultaneous bilingual children display a tendency to favor the analogical criterion, but this has been attested only in acceptability judgment data (for relevant discussion, see Bellamy et al. 2018). Liceras et al. (2012) examined judgment data from sequential and simultaneous Spanish/English bilingual children on gender assignment and agreement structures. They found that while both groups showed adherence to the analogical gender, simultaneous bilingual children were less sensitive to it than their sequential bilingual counterparts who more strongly adhered to the gender of the translation equivalent (cited in Liceras et al. 2016). Thus, based on previous findings, it remains inconclusive how simultaneous Spanish/English bilingual children employ the analogical gender in oral production.

It is noteworthy that in studies involving other language pairs, some evidence for the employment of the analogical criterion has also been reported. For example, Radford et al. (2007), in their analysis of longitudinal data from four French/German children (between ages 1;5 and 5;1), found that children relied on the analogical criterion. When children produced mixed DPs with French articles and masculine or feminine German nouns, they generally matched the gender of the French article to the gender of the German noun. At the same time, however, a point we further discuss in Section 3.2, Radford et al. also reported the application of the masculine default gender with neuter German nouns.

3.2 Masculine Default Gender

The employment of a default gender,[6] which is the masculine in Spanish (Roca 1989), has also been argued to play a predominant role in the gender assignment process in bilingual speech (e.g., Balam 2016a; Otheguy and Lapidus 2003; Valdés Kroff 2016, among others). In his study, Valdés Kroff (2016) found that masculine-

6 Importantly, Liceras and colleagues and other scholars have analyzed the analogical gender and the masculine default gender strategy in experimental work (Liceras et al. 2008, 2016, and references therein). Findings reveal a preference for the analogical criterion among simultaneous English/Spanish bilingual children, L1 Spanish L2 English bilingual children, and L1 Spanish L2 English adult bilinguals, but a preference for the masculine default strategy among L1 English L2 Spanish adult bilinguals (for a detailed summary of preferences vis-à-vis these two strategies in experimental data, see Liceras et al. 2016: 126).

marked mixed nominal constructions accounted for 96% of data produced by adult Spanish/English bilinguals from Miami, Florida. Crucially, a total of 34.8% (103/296) of English nouns that were assigned the masculine gender had feminine Spanish translation equivalents. These included cases in which human referents that were transparently feminine were assigned the masculine default gender as in *un renaissance woman* 'a renaissance woman'. Similar examples have also been reported for Spanish/English bilinguals in Northern Belize (Balam 2016a) and New York (Otheguy and Lapidus 2003).

This tendency to assign the masculine default gender to English nouns appears to be more pronounced in Spanish/English communities where bilinguals more frequently engage in code-switching (Balam 2016a; Królikowska et al. 2019). Naturalistic speech data have shown that in contexts that are characterized by ubiquitous code-switching, it is not surprising to find that speakers completely neutralize the masculine/feminine gender distinction in bilingual speech (i.e., only masculine-marked mixed nominal constructions are produced), as it has been attested in Northern Belize (Balam 2016a).

In the case of bilingual children, there is less conclusive evidence as to the employment of the masculine default gender in oral production (Liceras et al. 2008, 2016). Importantly, scholarly work on French/German bilingual children offer insight into the use of this strategy. Radford et al. (2007) found that when French-German children mix between French articles and German neuter nouns, children largely employed the masculine default gender. Along these same lines, Eichler et al. (2012: 253) found evidence that children use the masculine gender as the default gender. Eichler et al. analyzed 707 mixed DPs from 15 simultaneous bilingual children (Spanish/German, Italian/German and French/German children between ages 1;0 and 5;4) with different degrees of language dominance. Eichler et al. found that when combining Romance determiners with German neuter nouns in mixed nominal constructions, bilingual children overwhelmingly employed the masculine default gender strategy.

While it is true that the gender system configuration between French/German (two genders vs. three genders) and Spanish/English (two genders vs. no gender) are different, it is nonetheless remarkable that at very early stages of bilingual acquisition the masculine default strategy has been found to be operative among bilingual children with different degrees of language dominance. Based on current research, however, it remains unclear whether in the case of Spanish/English bilingual children, there is any preferential or systematic use of the masculine default gender in bilingual speech.

3.3 Phonological Gender

Lastly, the phonological gender criterion (i.e., when gender is assigned based on the terminal phoneme of an English noun) has been argued to play an influential role in the gender assignment process (Clegg and Waltermire 2009; DuBord 2004; Jake et al. 2002; Parafita Couto et al. 2016; Poplack et al. 1982; Smead 2000). The terminal phoneme (TP) of English nouns is relevant given that Spanish TPs are relatively predictive of gender assignment. Although there are many exceptions (for examples, see Gathercole 2002: 209–210; Roca 1989), the prototypical terminal phonemes *–o* and *–a* are predictive of the masculine and feminine gender in Spanish respectively. Nouns with non-canonical TPs (e.g., nouns that end in *–d*, *–e*, *–u*, etc.), which are less predictive, are usually more difficult to acquire and use than those ending with the canonical masculine and feminine morphemes (Brisk 1976; Teschner and Russell 1984, but see Fernández Fuertes et al. 2016).

Of relevance to our analysis is that there are certain Spanish TPs that favor the masculine gender while others favor the feminine gender (Teschner and Russell 1984). TPs that favor the masculine gender include *–n*, *–o*, *–r*, *–s*, *–e*, and *–l*, or NORSEL, whereas TPs that favor the feminine gender include *–a*, *–ad*, *–ión*, *–is*, or ADIONIS (Clegg and Waltermire 2009; DuBord 2004; Smead 2000; Teschner and Russell 1984). Support for the influence of the phonological criterion was found in a study conducted by Clegg and Waltermire (2009), who examined 204 Spanish/English NPs extracted from spontaneous conversations with 15 Spanish/English adult bilinguals from Northern New Mexico. In contrast to previous work (Jake et al. 2002), Clegg and Waltermire's variationist analysis showed that the gender associated with the TP of the English noun was more predictive than analogical gender (for relevant discussion, see Valdés Kroff 2016).

We must highlight that an inherent challenge that arises when examining the phonological gender, as aptly pointed out by Clegg and Waltermire, is that the feminine gender morpheme *–a* is not a productive TP in English lexical items (also see Jake et al. 2002: 82). Contrariwise, masculine-marked morphemes (i.e., NORSEL) are productive; thus, presenting us with an unavoidable confound. When speakers assign the masculine gender to an English noun that has a feminine translation equivalent (e.g., el_{masc} equirrel 'la$_{fem}$ ardilla$_{fem}$'), do we attribute this to the masculine default gender, to the masculine phonological gender, or to both? In Section 4, we describe the methodology that we employed to investigate children's gender assignment patterns in monolingual Spanish versus mixed nominal constructions. We also explain the coding scheme that we used to address the aforementioned confound in order to analyze the use of the masculine default gender in mixed nominal constructions.

4 Method

4.1 Research Questions

Our study was guided by the following two questions.

1 What are the overall gender assignment patterns in children's production of monolingual Spanish and mixed nominal constructions?

In line with results from previous research (Gathercole 2002; Montrul and Potowski 2007), we anticipated that two-way bilingual fifth graders would show fewer gender mismatches in monolingual Spanish nominal constructions than second graders in English immersion programs. In Spanish/English nominal constructions, our expectation was that they would primarily be masculine-marked. We also anticipated productive use of the feminine gender, as a result of the employment of the analogical gender criterion in mixed nominal constructions.

2 How do different gender assignment strategies account for the gender that is assigned to English nouns with feminine translation equivalents?

When assigning gender to English nouns with Spanish feminine translation equivalents, we anticipated that children would exhibit a predisposition towards the application of the analogical gender, in line with Liceras et al.'s (2012) previous findings for acceptability judgment data. Alternatively, following Liceras et al. (2008, 2016), we expected that at least some chidren, particularly second graders, would not show a clear preference for a particular gender assignment strategy.

4.2 Data and Analysis

We analyzed narrative data from the CHILDES database (MacWhinney 2000). The oral narratives, elicited using Mayer's (1969) wordless picture book *Frog Where Are You*, were collected by Pearson (2002). We examined 1774 monolingual Spanish and 220 Spanish/English nominal constructions (for complete list of mixed nominal constructions, see Appendix A), extracted from 39 Spanish narratives produced by 39 US-born Spanish/English bilingual children from Miami Dade, Florida. Excluded from the dataset of monolingual Spanish constructions were all cases with *el/la agua* 'the water' ($n = 48$), as *agua* is an exceptional hermaphroditic noun that is phonologically-conditioned and exhibits variation in terms of gender assignment (Eddington and Hualde 2008: 15).

The narratives for the present analysis were selected via purposeful sampling. Given our interest in gender assignment in bilingual speech, only children who produced at least one mixed nominal construction were selected for the analysis. Note that when telling the Spanish stories to their interlocutors (who knew Spanish and English), the children were in a bilingual mode. They used mainly Spanish with some code-switching to English in these stories. The bilingual nominal constructions overwhelmingly comprised cases in which a gender-marked Spanish determiner co-occurred with an English noun (e.g., *un rock* 'a rock', *un reindeer* 'a reindeer', *una owl* 'an owl', etc.).

As Table 1 shows, the sample included nineteen second graders (ages 7;0–8;0) and twenty fifth graders (ages 10;0–11;0) with different schooling backgrounds. The children across the two instructional programs and grade levels came from homes where the language of the home was either 'Mostly Spanish' or 'Spanish and English equally' (from birth until age 5). All of them had been in the same educational program since kindergarten and only those children who had experienced the educational program for two years were included in the original study conducted by Pearson (2002) and her colleagues. Note that despite this distinction between the language of the home as 'Mostly Spanish' or 'English and Spanish equally', by the time children moved to the second grade, they all tended to be English-dominant (see Pearson 2002: 171).

The original sample in our study included twenty second graders, but there was an English immersion second grader (ID11221366) whose data showed exceptional patterns. The gender assignment patterns of this child skewed the data, particularly monolingual Spanish tokens, which mostly comprised gender assignment mismatches in which masculine nouns were assigned the feminine gender (e.g., **la niño* 'the boy' and **la perro* 'the dog', 92%, 36/39). Notably, in mixed nominal constructions ($n = 9$), this child assigned the feminine gender to all English nouns. It is not clear why this child overwhelmingly employed the feminine gender. It may constitute an idiosyncratic case in which a feminine default gender was applied as opposed to the canonical masculine default gender. Given that this child's gender assignment patterns markedly deviated from those attested among the remaining children, we excluded these data in our regression analyses.

Table 1: Sample of Spanish/English bilingual children.

	Second graders	Fifth graders
English immersion	9	10
Two-way bilingual program	10	10

To analyze the data, we extracted all monolingual Spanish nominal constructions and mixed nominal constructions from the same narratives produced by each child. Each nominal construction was then coded for gender on the determiner (masculine vs. feminine); noun gender (i.e., gender of the Spanish noun or translation equivalent in the case of mixed nominal constructions); phonological gender (i.e., gender based on NORSEL and ADIONIS); instructional program (i.e., English immersion vs. two-way bilingual); and grade level (i.e., second vs. fifth graders). The narrative transcripts provided the information on these extralinguistic factors. Each transcript had a unique ID number, which provided information on the child's background. We extracted information only from digits 1 (instructional program) and 4 (grade level).

For Spanish nominal constructions, noun gender refers to the gender of the noun as an inherent lexical property (i.e., masculine or feminine). In the case of mixed nominal constructions, we coded noun gender according to the gender of the Spanish translation equivalent. Translation equivalents for English-origin nouns, both masculine- and feminine-marked, were provided by Pearson (2002) in the CHILDES transcripts.[7] Note that these translation equivalents took into account the child's monolingual Spanish discourse and dialectal differences in the use of specific lexical items (for a complete list, see Appendix A). In the few cases where equivalents were not provided by Pearson and colleagues, we chose the equivalent whose token frequency was the highest for the particular sub-group of children.

To examine the employment of the masculine default gender, we only analyzed English nouns with feminine translation equivalents. As previously pointed out, a problematic confound with masculine-marked mixed nominal constructions with masculine translation equivalents is that we are unable to differentiate among the application of the analogical masculine gender, the phonological gender, and/or the masculine default gender (e.g., the masculine gender in *el*$_{masc}$ hole/el$_{masc}$ hueco$_{masc}$ can be accounted for by all three gender assignment stretegies).

Therefore, a more reliable method to evaluate the use of the masculine default strategy is to focus on English nouns with feminine translation equivalents that are nonetheless assigned the masculine gender (e.g., *el*$_{masc}$ beehive for *la*$_{fem}$ *colmena*$_{fem}$). In order to identify gender assignment cases that could more likely be attributed to the employment of the masculine default gender, we devised a coding

7 Overall, there were only 10 cases in which nine children used an English noun and its corresponding Spanish equivalent or near-equivalent, as in (3), in the same narrative.

(3) *Y el perro, em, estaba parado al lado del, del* tree. *Y el niño estaba buscando por el hueco de un árbol.*
'And the dog, um, was standing by the, by the tree. And the boy was searching by the hole of a tree.'

scheme (see Table 2) that distinguishes cases of gender assignment ambiguity or overlap (i.e., cases that could be accounted for either by the masculine default gender or the masculine phonological gender) versus those without any overlap (i.e., cases that could only be accounted for by the masculine default strategy).

As Table 2 shows, we coded for ambiguous cases of the analogical masculine gender, which included masculine-marked mixed nominal constructions that could be accounted for by the analogical masculine gender, the masculine default gender, and/or the phonological gender. Our focus, however, was primarily on cases that had feminine translation equivalents. Recall that only these examples are more likely to cast light on the potential employment of the masculine default gender. For mixed nominal constructions containing English nouns with feminine translation equivalents, we differentiated among gender assignment cases that were ambiguous versus those that were not. This coding scheme was particularly advantageous as it allowed us to identify cases that could more likely be accounted for by the masculine default gender, as well as those that could be accounted for by the analogical criterion.

Cases of the unambiguous analogical feminine gender refer to mixed nominal constructions in which the gender of the article only matched the gender of the translation equivalent (e.g., *una*$_{\text{fem}}$ owl '*una*$_{\text{fem}}$ *lechuza*$_{\text{fem}}$'). On the other hand, cases of the unambiguous feminine gender referred to examples where the gender of the article did not match the gender of the translation equivalent, and the feminine gender was assigned in a 'default-like' manner (e.g., *la*$_{\text{fem}}$ other side '*el*$_{\text{masc}}$ *otro*$_{\text{masc}}$ *lado*$_{\text{masc}}$'). In our coding scheme in Table 2, we have used a question mark symbol to indicate that these highly infrequent feminine-marked mixed nominal constructions suggest that children may still be in the process of acquiring

Table 2: Gender categories used to analyze gender assignment strategies in mixed nominal constructions.

Gender	Example	Analogical gender	Default gender	Phonological gender
Ambiguous analogical masculine	*un* deer 'un venado'	√	√	√
Unambiguous analogical feminine	*una* owl 'la lechuza'	√	X	X
Unambiguous feminine	*una* log 'un tronco'	X	?	X
Ambiguous masculine default	*un* squirrel 'una ardilla'	X	√	√
Unambiguous masculine default	*un* rock 'una piedra'	X	√	X

an important code-switching grammatical pattern. In our analysis in Section 5.2, we return to this point. For feminine-marked tokens the phonological gender was not relevant, as feminine TPs (i.e., ADIONIS) were not attested. Consonant with previous findings (Clegg and Waltermire 2009; Jake et al. 2002), our data revealed that only English nouns with masculine TPs (i.e., NORSEL) were produced.[8]

The ambiguous masculine default gender included cases with gender assignment overlap (e.g., *un*$_{\text{masc}}$ hole '*un*$_{\text{masc}}$ *hueco*$_{\text{masc}}$'), in which the gender of the article could be accounted for either by the analogical masculine gender, the masculine default gender, and/or the phonological gender. Lastly, the unambiguous masculine default gender referred to cases where only the masculine default gender could account for the gender assigned to the English-origin noun (e.g., *un*$_{\text{masc}}$ rock '*una*$_{\text{fem}}$ *piedra*$_{\text{fem}}$'). This coding scheme yielded a granular insight into the employment of the ambiguous versus the unambiguous masculine default gender strategy.

Note that following previous work (Clegg and Waltermire 2009; DuBord 2004; Smead 2000), in order to determine phonological gender, we coded mixed nominal constructions using the following categories: TPs that favor the masculine gender (i.e., NORSEL, excluding *–s* as morphological marker of plurality); TPs that favor the feminine gender (i.e., ADIONIS); and atypical TPs (i.e., other TPs such as *–g* in *el* frog 'the frog', *–k* in *un* rock, and *–f* in *una* cliff 'a cliff'). Of relevance to our analysis were TPs that favored the masculine gender in particular, as these are the TPs that contribute to a confound in the employment of gender assignment strategies. In the ensuing section, we present our results.

5 Results

We first report results from gender assignment patterns in monolingual Spanish nominal constructions. Our main goal was to first of all establish whether children had successfully acquired grammatical gender and to determine whether there was any pre-existing pattern in monolingual Spanish constructions that could shed light on how these children use gender assignment strategies in bilingual speech. Recall that because of differences in terms of children's exposure to

8 Nouns ending with both masculine TPs (e.g., *la*$_{fem}$ owl 'the owl', *la*$_{fem}$ jar 'the jar') and atypical TPs (e.g., *la*$_{fem}$ ground 'the ground', *una*$_{fem}$ cliff 'a cliff') were assigned the feminine gender. Phonology of the English noun does not appear to play an influential role in the gender that was assigned to feminine-marked mixed nominal constructions. Based on these results, we concur with Valdés Kroff (2016) in that gender assignment in Spanish/English mixed nominal constructions may not be determined by the TP of the English noun.

Spanish input via schooling, there was the possibility that patterns in monolingual Spanish could possibly influence gender assignment in mixed nominal constructions.

5.1 Gender Assignment in Monolingual Spanish Nominal Constructions

As Figure 1 shows, the majority of monolingual Spanish and code-switched nominal constructions were masculine-marked. It is noteworthy that in the monolingual Spanish constructions, masculine-marked tokens accounted for 70% (1242/1774) of the data. This percentage is higher than those reported for adult Spanish/English bilinguals, which are typically less than 55% (e.g., data from Northern Belize: Balam 2016a; data from New Mexico: Clegg and Waltermire 2009; data from New York: Otheguy and Lapidus 2003).

The data showed that the masculine/feminine gender distinction was fully operative in Spanish nominal constructions (n = 1774) produced by all children (n = 39). Table 3 below shows the total number of masculine- versus feminine-marked Spanish nominal constructions for each sub-group, followed by their respective proportions in relation to the total number of Spanish nominal constructions produced.

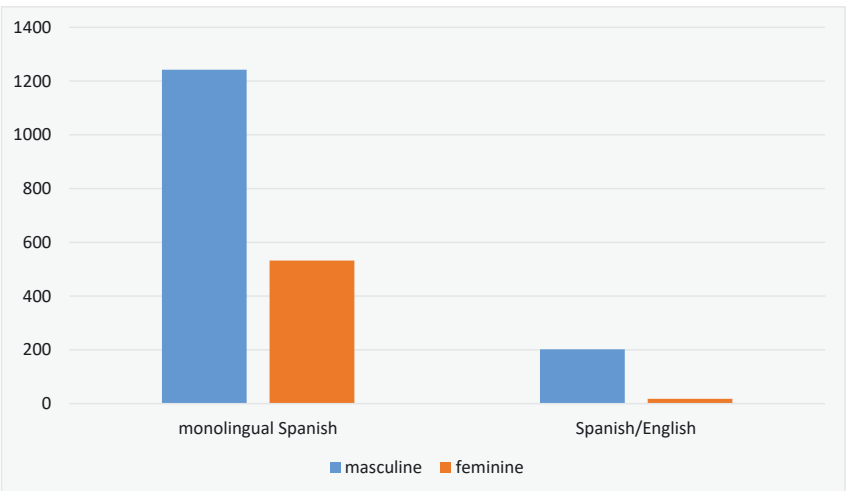

Figure 1: Masculine- versus feminine-marked nominal constructions.

Table 3: Gender assignment in monolingual Spanish nominal constructions.

	Masculine-marked				Feminine-marked			
	N	%	Mean *N*	*SD*	*N*	%	Mean *N*	*SD*
English immersion second graders	262/401	65.3	28.9	12.8	139/401	34.7	15.6	10.0
Two-way bilingual second graders	328/422	77.7	33.1	13.3	94/422	22.3	9.4	6.6
English immersion fifth graders	303/431	70.3	30.5	10.2	128/431	29.7	12.6	5.9
Two-way bilingual fifth graders	349/520	67.1	34.9	17.5	171/520	32.9	17.1	5.5

In terms of gender assignment mismatches (i.e., cases when a masculine determiner was combined with a feminine noun, as in el_{masc} $rana_{fem}$ 'the frog', or when a feminine determiner was combined with a masculine noun, as in 'la_{fem} $niño_{masc}$'), fifth graders enrolled in a two-way bilingual program generally produced the least number of nominal constructions in which the gender on the article did not correspond with the gender of the noun (see Table 4). The highest rates of gender assignment mismatches were attested among two-way bilingual second graders (4.3%) and English immersion fifth graders (3.9%). Crucially, none of the sub-groups' mean production of mismatches were above 5%; hence, suggesting successful acquisition of grammatical gender among all groups.

In order to determine whether the two independent factors of grade level (second vs. fifth graders) and instructional program (English immersion vs. two-way bilingual) significantly impacted the likelihood of the children's (n = 39) assignment of accurate grammatical gender in monolingual Spanish nominal constructions (n = 1774), a fixed-effects logistic bionomial regression analysis was conducted (see Table 5) using Language Variation Suite Toolkit, a web-based

Table 4: Article-noun gender assignment mismatches produced by sub-groups of bilingual children.

	N	%	Mean *N*	*SD*
English immersion second graders	13/401	3.2	1.1	1.1
Two-way bilingual second graders	18/422	4.3	2.3	3.7
English immersion fifth graders	17/431	3.9	2.3	3.8
Two-way bilingual fifth graders	9/520	1.7	1.2	2.1

application for sociolinguistic analysis, built in R (for details, see Scrivner and Díaz-Campos 2016). The dependent variable in the regression model, namely accuracy consisted of two levels (gender assignment matches vs. mismatches). For the dependent variable, the mismatch option was chosen as the reference value.

As Table 5 illustrates, both grade level (0.467) and instructional program (0.313) do not exert a significant effect on the degree of gender assignment accuracy in monolingual Spanish nominal constructions. Thus, despite differential experiences in terms of schooling, children do not differ in terms of gender assignment accuracy in monolingual Spanish nominal constructions.

Among the four sub-groups of children, as Table 6 shows, there were only minor differences in terms of gender mismatches. Particularly in the speech of two-way second graders and two-way bilingual fifth graders, mismatches mostly comprised cases in which feminine nouns were assigned the masculine gender (e.g., **el ventana* 'the window', **un piedra* 'a stone', **el rana* 'the frog', etc.). Note that overgeneralization of the masculine gender among Spanish/English bilingual children in the U.S. has also been found in previous work on gender assignment (Cuza and Pérez-Tattam 2016; Goebel-Mahrle and Shin 2020). For example, in their analysis of gender mismatches among three groups of US child heritage speakers (ages 5;0–6;0, 7;0–8;0, 9;0–11;0), Goebel-Mahrle and Shin (2020) find that the masculine gender is particularly overgeneralized in the context of direct object clitics that refer to feminine nouns.

Table 5: Coefficients of fixed-effects logistic regression.

	Estimate	Std error	*t*-Value	*p*-Value
Intercept	3.4056	0.2497	13.639	<2e-16***
Grade level = fifth	0.1371	0.2990	0.458	0.467
Instructional program = two-way	0.3030	0.3001	0.010	0.313

Table 6: Types of gender mismatches.

	Feminine nouns assigned the masculine gender		Masculine nouns assigned the feminine gender	
	N	%	*N*	%
English immersion second graders	7/401	1.7	6/401	1.5
Two-way bilingual second graders	16/422	3.8	2/423	0.5
English immersion fifth graders	6/431	1.4	11/431	2.6
Two-way bilingual fifth graders	6/520	1.2	3/520	0.6

Contrariwise, among English immersion fifth graders, gender assignment mismatches were primarily cases in which masculine nouns were assigned the feminine gender (e.g., **la sapo* 'the frog', **la arbol* 'the tree', **la niño* 'the boy', etc.). It must be highlighted, however, that this was an exceptional case, as 90% (10/11) of these mismatches were produced by a single child. Importantly, this English immersion fifth grader's overuse of the feminine gender only applied to Spanish nominal constructions but not mixed nominal constructions. Thus, overall, the masculine gender was overgeneralized to feminine nouns.

In sum, despite differences in grade level and instructional program, children had largely acquired grammatical gender and did not significantly differ in terms of gender assignment accuracy or the types of mismatches they produced in monolingual Spanish nominal constructions.

5.2 Gender Assignment in Mixed Nominal Constructions

In bilingual speech, as Table 7 illustrates, the use of the masculine gender was also predominant across the four sub-groups of children, whereas the production of feminine-marked mixed nominal constructions was infrequent (i.e., 8.2%, 18/220). No statistical difference was found among groups in terms of their gender assignment patterns. Chi-square tests of independence showed that the distributions of masculine- versus feminine-marked mixed nominal constructions and instructional program were independent for both second graders ($\chi^2 = 0.268$, $df = 1$, $p = 0.605$) and fifth graders ($\chi^2 = 1.166$, $df = 1$, $p = 0.280$). They were also independent when analyzing the data according to children's enrollment either in English immersion ($\chi^2 = 0.291$, $df = 1$, $p = 0.589$) or two-way bilingual programs ($\chi^2 = 1.051$, $df = 1$, $p = 0.305$). This suggests that there is no association between schooling and children's production of masculine- versus feminine-marked mixed nominal constructions. Irrespective of the grade and program in which children were enrolled, their gender assignment patterns in bilingual speech were largely similar.

Table 7: Gender assignment in Spanish/English mixed nominal constructions.

	Masculine-marked				Feminine-marked			
	N	**%**	**Mean**	***SD***	***N***	**%**	**Mean**	***SD***
English immersion second graders	39/43	90.6	4.3	6.1	4/43	9.3	0.4	0.7
Two-way bilingual second graders	57/61	93.4	5.7	4.5	4/61	6.5	0.4	0.5
English immersion fifth graders	71/76	93.4	7.1	7.4	5/76	6.5	0.5	0.8
Two-way bilingual fifth graders	35/40	87.5	3.5	1.2	5/40	12.5	0.5	0.7

The predominant use of the masculine gender and the infrequent employment of the feminine gender closely resemble the asymmetrical pattern that was found among Spanish/English adult bilinguals from Miami, Florida (Valdés Kroff 2016). However, one way in which our results differ from Valdés Kroff's findings is that not all feminine-marked mixed nominal constructions (n = 18) were characterized by disfluencies, reformulations, repetitions and/or pauses leading up to the mixed nominal construction, as in (4).

(4) *El niño y el perro*, um, *vieron la…*
The boy and the dog, um, see-3PL the-SG.FEM
la jar
the-3SG.FEM jar
'The boy and the dog saw the jar.'
(female, second grader, ID 22222312)

Of the eighteen feminine-marked mixed nominal constructions (see Appendix B), there were eight cases in which there were no apparent disfluencies leading to the mixed nominal construction, as in (5) and (6). Thus, it is not the case that feminine-marked mixed nominal constructions are necessarily instantiations of 'less planned' code-switching that are triggered by a failure to retrieve the intended Spanish noun, as Valdés Kroff observes.

(5) *El perro 'taba sentando a(d)mirando la* frog
The dog be-3SG sit.PROG admire.PROG the-SG.FEM frog
'The dog was sitting down, admiring the frog'
(female, second grader, ID 11222078)

(6) *Estaba buscando… adonde estaban las* bees
Be-3SG find.PROG where be-3PL the-PL.FEM bees
'He was searching … where the bees were.'
(female, fifth grader, ID 21232416)

It is important to point out that feminine-marked mixed nominal constructions were produced by both second (n = 7) and fifth graders (n = 7) and included children who were enrolled in English immersion (n = 6) and two-way bilingual programs (n = 8). Therefore, these infrequent constructions cannot be associated with a particular schooling experience.

Another noteworthy difference about children's feminine-marked mixed nominal constructions is that there were attested cases in which 'a feminine default' was seemingly employed (e.g., *la* other side 'el otro lado'; *una* log 'un tronco'). Though highly infrequent (n = 4), these examples in which the feminine-marked article does not match the gender of the translation equivalent seem to be

distinctive of children's oral production. In the data sets of feminine-marked mixed nominal constructions produced by Miami and Northern Belize code-switchers, there are no such examples. In adult data from both Miami (e.g., *la* cheerleader pesada 'la animadora pesada', *las* sheets 'las sábanas', etc.) and Northern Belize (e.g., *la* nurse 'la enfermera', *la* bell 'la campana', etc.), most feminine-marked mixed constructions are accounted for by the analogical feminine gender (Balam 2016a; Valdés Kroff 2016). Thus, the 'default-like' use or overextension of the feminine gender in children's oral production suggests that they may still be in the process of acquiring the nuanced code-switching pattern that whereas English nouns with translation equivalents from both genders can be assigned the masculine gender, the same is not true for the feminine gender.[9]

5.2.1 Gender Assigned to English Nouns with Feminine Translation Equivalents

We subsequently examined how gender assignment strategies accounted for the gender that was assigned to English nouns with feminine translation equivalents. Table 8 shows that all sub-groups of children had similar tendencies in terms of their employment of the different strategies, with some differences in their use of the ambiguous masculine gender and the unambiguous masculine default gender. Articles in mixed nominal constructions were infrequently marked with the feminine gender (e.g., *una* owl 'la lechuza', *la* frog 'la rana', *la* beehive 'la colmena', etc.). Overall, 39.1% (86/220) of masculine-marked mixed nominal constructions had feminine translation equivalents (e.g., *un* squirrel 'una ardilla', *un* rock 'una piedra', *el* window 'la ventana', etc.) similar to the proportion reported by Valdés Kroff (2016) for adult Spanish/English bilinguals from Miami (i.e., 34.8%, 103/296).

Notably, while the percentage of mixed nominal constructions that could be accounted for by the ambiguous analogical masculine gender increased across grade level and instructional programs (32.6 < 49.2 < 60.5 < 65.0), there was a corresponding decrease in children's employment of the unambiguous masculine default gender (46.5 > 32.8 > 21.1 > 12.5). English immersion second graders appeared to primarily rely on the unambiguous masculine default gender strategy in bilingual speech (46.5%). In contrast, the majority of mixed nominal constructions produced by the remaining three sub-groups of children were categorized as ambiguous analogical masculine. As we highlighted in our methodology, however, for these masculine-marked mixed nominal constructions with masculine translation equivalents (e.g., *el* tail 'el rabo', *el* bottle 'el frasco', *el* deer 'el venado, *el* bowl 'el jarrón', *el* jar 'el pomo', etc.), we are unable to tease apart which particular stategy was

9 Another possibility is that the feminine article may have resulted because of its association with a more frequent but semantically related word (e.g., 'una wood' → *la madera* 'the wood').

Table 8: Gender assignment: all mixed nominal constructions.

Gender on article	Second graders				Fifth graders			
	English-immersion		Two-way bilingual		English-immersion		Two-way bilingual	
	N	%	*N*	%	*N*	%	*N*	%
Ambiguous analogical masculine	14	32.6	30	49.2	46	60.5	26	65.0
Unambiguous analogical feminine	4	4.7	3	4.9	4	5.3	4	10.0
Unambiguous feminine	1	4.7	1	1.6	1	1.3	1	2.5
Ambiguous masculine default	5	11.6	7	11.5	9	11.8	4	10.0
Unambiguous masculine default	19	46.5	20	32.8	16	21.1	5	12.5
Total	43	100	61	100	76	100	40	100

employed (i.e., analogical gender, the phonological gender, or the masculine default strategy).

In order to cast light on the employment of the masculine default gender strategy, we analyzed only mixed nominal constructions containing English nouns with feminine translation equivalents, which comprised 47.3% of the mixed nominal constructions (i.e., 104/220). Table 9 below shows that across participant groups there was a marked preference for the unambiguous masculine default gender when assigning gender to English nouns with feminine translation equivalents (e.g., *el* frog 'la rana', *un* edge 'la orilla', *un* beehive 'una colmena', *un* rock 'una piedra', *el* window 'la ventana'). Importantly, bilingual children's gender assignment strategies in mixed nominal construtions did not differ based on their schooling experience.

Endeavoring to determine whether grade level or instructional program had a significant effect on children's employment of gender assignment strategies, a fixed-effects logistic multinomial regression analysis was carried out.[10] Table 10 illustrates the results for the regression model, which included grade level (second vs. fifth graders), instructional program (English immersion vs. two-way bilingual) as independent factors and gender category (unambiguous feminine gender; unambiguous feminine analogical gender; ambiguous masculine default gender; unambiguous masculine default gender) as the dependent variable. For the dependent variable category, the ambiguous masculine default gender was chosen as the

10 One of the conditions for fixed effects Logit models is that the dependent variable must be measured on at least two occasions for each individual (Allison 2009). Therefore we excluded cases ($n = 7$) where less than two mixed nominal construction tokens were produced by the same child. The resulting number of tokens included for the regression analysis was 97.

Table 9: Gender assignment: mixed nominal constructions with feminine translation equivalents.

Gender on article	Second graders				Fifth graders			
	English-immersion		Two-way bilingual		English-immersion		Two-way bilingual	
	N	%	*N*	%	*N*	%	*N*	%
Unambiguous analogical feminine	4	13.8	3	9.7	4	13.3	4	28.6
Unambiguous feminine	1	3.5	1	3.2	1	3.3	1	7.1
Ambiguous masculine default	5	17.2	7	22.6	9	30.0	4	28.6
Unambiguous masculine default	19	65.5	20	64.5	16	53.3	5	35.7
Total	29	100	31	100	30	100	14	100

reference value. Note that for this regression, we excluded cases of the ambiguous analogical masculine gender. Recall that only mixed nominal constructions with English nouns that have feminine translation equivalents are able to cast light on the potential employment of the masculine default gender.

As Table 10 illustrates, neither of the independent predictors exert a significant effect on the use of one of the different categories of the dependent variable

Table 10: Coefficients of a fixed effects logistic regression model with a McFadden R2 of 0.030068.

	Estimate	Std error	*t*-Value	*p*-Value
Unambiguous feminine gender (Intercept)	−1.21618	0.91099	−1.3350	0.181875
Unambiguous analogical feminine gender (Intercept)	−0.94845	0.69601	−1.3627	0.172980
Unambiguous masculine default gender (Intercept)	1.43650	0.45377	3.1657	0.001547**
Unambiguous feminine gender: grade level = fifth graders	−0.40816	1.11519	−0.3660	0.714368
Unambiguous analogical feminine gender: grade level = fifth graders	0.25468	0.70373	0.3619	0.717429
Unambiguous masculine defaut gender: grade level = fifth graders	−0.85008	0.51176	−1.6611	0.096694
Unambiguous feminine gender: instructional program = two-way	−1.03727	1.25970	−0.8234	0.410263
Unambiguous analogical feminine gender: instructional program = two-way	0.51988	0.70212	0.7404	0.459029
Unambiguous masculine defaut gender: instructional program = two-way	−0.35441	0.51300	−0.6909	0.489653

(i.e., unambiguous analogical feminine gender, unambiguous feminine gender, and unambiguous masculine default gender) relative to the control/reference (ambiguous masculine default gender) in mixed nominal constructions (all p-values > 0.05). These results indicate that even though there were differences in children's schooling experience in terms of grade level and instructional program, the strategies that they employed to assign gender to English nouns with feminine translation equivalents were strikingly similar and systematic. There was no evidence that gender assignment strategies were employed randomly. Across groups, the data showed that even when we take the phonological gender into consideration, the majority of mixed nominal constructions with feminine translation equivalents are nonetheless primarily accounted for by the unambiguous masculine default strategy. In Section 6, we discuss the implications of these results.

6 Discussion and Conclusion

While studies have documented children's production of masculine- and feminine-marked Spanish/English mixed nominal constructions (Arias and Lakshmanan 2005; Liceras et al. 2008, 2016 and references therein), this is the first study to examine the employment of the analogical gender, the masculine default gender, and the phonological gender in mixed nominal constructions among Spanish/English bilingual children from Miami, Florida. In relation to our first research question, we found that monolingual Spanish nominal constructions were primarily masculine-marked and rates of gender assignment mismatches for the four sub-groups of children were below 5%; thus, indicating native-like acquisition of grammatical gender. As it relates to our second research question, results revealed that irrespective of children's schooling experience, the unambiguous masculine default gender was employed to assign gender to the majority of English nouns with feminine translation equivalents. Contrary to our hypothesis, this preference was consistenly found across all subgroups of children.

Our results indicate that all children evinced native-like acquisition of grammatical gender, irrespective of schooling experience. Furthermore, dual immersion schooling does not appear to markedly impact children's use of gender assignment strategies in bilingual speech. Despite differences in children's exposure to Spanish input, children in both instructional programs employed the unambiguous masculine default gender as the main strategy to assign gender to English nouns with feminine translation equivalents. The use of the masculine default gender strategy in mixed nominal constructions was consistent among all

sub-groups of children. This suggests that the use of gender assignement strategies in our sample of English-dominant simultaneous Spanish/English bilingual children is not random in nature. In contrast to previous findings for production data by Liceras et al. (2008), we see that as early as age 7, there is an established preference for the masculine default gender strategy when assigning gender to English nouns with feminine translation equivalents.

Our findings point in the direction of a hybrid gender assignment system, in which the masculine/feminine gender distinction is largely neutralized in Spanish/English mixed nominal constructions but not Spanish monolingual ones. These results support the view that simultaneous Spanish/English bilinguals, including children, 'adaptively simplify' (Otheguy and Lapidus 2003) the Spanish gender assignment system in mixed nominal constructions. This is a reflex of the bi/multilingual mind that aims to prioritize a principle of economy rather than to faithfully maintain the grammatical procedures of the gendered language (in our case Spanish) in code-switched constructions. The striking parallels between our findings and those from several adult Spanish/English code-switching communities suggest that a defining characteristic of mixed nominal constructions is the employment of the masculine default gender strategy in bilingual speech. Importantly, this does not mean that all Spanish/English communities will resort to the prevalent use of the masculine default gender (e.g., El Paso, Texas: Królikowska et al. 2019).

With respect to feminine-marked mixed nominal constructions, our data showed that these constructions are indeed exceptional. It is not the case, however, that they are necessarily reflective of unintended or less planned code-switching as Valdés Kroff (2016) posits. From previous work, we know that code-switching can actually mask lexical retrieval issues and help to avoid potential tip of the tongue states (for relevant discussion, see Ecke 2009). In our study, children produced feminine-marked mixed nominal constructions in which there were no apparent disfluencies, pauses or repair phenomena leading up to the switch. In his analysis of feminine-marked mixed nominal constructions produced by adult Spanish/English bilinguals, Balam (2016a: 18) also found a similar pattern. In the Northern Belize corpus, the majority of feminine-marked mixed nominal constructions were not characterized by disfluencies or hesitations. More research on these exceptional switches in different child and adult bilingual populations could elucidate whether analogical gender and animacy are the most deterministic gender assignment factors in these highly infrequent constructions, as Balam (2016a) observes.

An issue that falls outside the purview of this paper is when exactly children's preference for the default strategy starts mirroring patterns attested among adult Spanish/English bilinguals. Based on the work conducted by Liceras and

colleagues and our findings, this could be between ages 5;8 and 7;0. Alternatively, it may be that this preference is actually established as early as 3;0, which has been posited as the age when children's code-switching patterns start paralleling those of adult bilingual code-switchers (Köppe and Meisel 1995). Future research on younger children's naturalistic production data needs to be carried out to better understand when simultaneous bilingual children's gender assignment patterns in mixed nominal constructions converge on those attested among adults in their respective communities. Thus far, it remains unclear whether this convergence is dependent or not on the native-like acquisition of grammatical gender in monolingual Spanish constructions.

Furthermore, research must be carried out to examine whether children across different Spanish/English bilingual communities evince similar gender assignment patterns, as in Fernández Fuertes et al. (2016). We do not know whether in the case of Northern Belize, El Paso or Gibraltar, simultaneous bilingual children would reveal prevalent use of the analogical gender criterion or the masculine default gender; hence, mirroring the preference for the strategy found among adult bilinguals in these communities. To have a better understanding of the uniformity and/or variability in the employment of gender assignment strategies among children, comparative research on different child bilingual populations in necessary. It would be especially advantageous to further investigate child populations in code-switching communities like Northern Belize where code-switching is unmarked and bilingual language practices are indexical of speakers' bi/multilingual identities (Balam 2013, 2016b). This research could provide much needed insight into the relative impact that language dominance, type of bilingualism, type of code-switching (i.e., marked vs. unmarked), and established community linguistic norms have on child bilingual grammars.

We do recognize that a limitation in any study that examines the analogical criterion using corpus data relates to the choice of translation equivalents, as it is difficult to determine a fail-safe way to know the equivalent for each English noun in mixed nominal constructions that children produce. Perhaps future analyses of the analogical criterion could be bolstered by speakers' completion of post-vocabulary tests. Another aspect of our study that could be controlled for in future experimental work is the distribution of masculine and feminine Spanish nouns as in Liceras et al. (2008). We are aware that in the children's narratives, there were fewer contexts for feminine nouns. Thus, the feminine gender article may have had fewer chances of being activated whereas the threshold for activation of the masculine articles was lower and could therefore be more quickly accessed and employed. The story itself may have favored the use of the masculine gender. It is necessary to verify whether even under experimental conditions in which the total number of masculine versus feminine nouns are more equal, simultaneous

Spanish/English bilingual children nonetheless evince a preference for the unambiguous masculine default gender strategy in mixed nominal constructions.

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APPENDIX A: Spanish/English Mixed Nominal Constructions (*n* = 229)

Second Graders

ID 11121381

1. un frog [una rana]

ID 11221366

2. una bee [una abeja]
3. una beehive [una colmena]
4. la beehive [la colmena]
5. la tree [la mata]
6. la bees [las abejas]
7. la owl [la lechuza]
8. la tree [la mata]
9. la owl [la lechuza]
10. la rock [la piedra]

ID 11222078

11. la frog [la rana]
12. el frog [la rana]
13. el frog [la rana]
14. el window [la ventana]

15. el frog [la rana]
16. lo bees [las abejas]
17. lo bees [las abejas]
18. el hole [el hueco]
19. un squirrel [una ardilla]
20. un squirrel [una ardilla]
21. los bees [las abejas]
22. los bees [las abejas]
23. lo bees [las abejas]
24. los bees [las abejas]
25. un owl [el búho]
26. lo bees [las abejas]
27. un rock [una piedra]
28. un rock [una piedra]
29. del deer [del venado]
30. el log [el tronco]
31. un baby frog [una ranita]

ID 11222304

32. los babies [las ranitas bebitas]
33. un baby [una rana bebita]

ID 12122022

34. los socks [los calcetines]
35. los socks [los calcetines]
36. al honey bee [el panal]
37. la honey bee [el panal]
38. una wood [un tronco]

ID 12122132

39. el squirrel [el topo]
40. el tail [el rabo]
41. el squirrel [el topo]
42. un owl [un búho]
43. el owl [el búho]
44. una rock [una roca]
45. del rock [la roca]

ID 12122141

46. un deer [un venado]

ID 12128888

47. un owl [una lechuza]

ID 12222288

48. un tree [una mata]

ID 12222289

49. un deer [un venado]
50. el deer [el venado]
51. el deer [el venado]
52. del log [del tronco]

ID 21121222

53. el bowl [el jarrón]
54. el bowl [el jarrón]
55. el window [la ventana]
56. un hole [un hueco]
57. un squirrel [una ardilla]
58. un hole [un hueco]
59. del hole [del hueco]
60. una race [una carrera]
61. el owl [el búho]
62. un deer [el venado]
63. del log [del tronco]

ID 21122088

64. un owl [una lechuza]
65. un deer [un venado]

ID 21221145

66. un deer [el venado]

ID 21221502

67. un hamster [un topo]
68. un beehive [una colmena]
69. un deer [un venado]
70. el deer [un venado]
71. el deer [un venado]

ID 21222192

72. el bowl [el jarrón]
73. los bees [las abejas]
74. un hive [una colmena]
75. el squirrel [el topo]
76. la beehive [la colmena]
77. un deer [un venado]
78. el deer [el venado]

ID 22121158

79. el pooch [el perro]
80. el owl [el búho]
81. el owl [el búho]

ID 22121160

82. la frog [la rana]
83. al bottle [al frasco]
84. el bottle [el frasco]
85. el bottle [del frasco]
86. los bees [las abejas]
87. al bee [a las abejas]
88. el bee [la abeja]
89. el frog [la rana]
90. los dos frog [los dos ranas]
91. los frogs [las ranas]

ID 22121164

92. un moose [un venado]

ID 22222312

93. la jar [la jarra]
94. el jar [la jarra]
95. un hole [el hueco]
96. los bees [las abejas]
97. el beehive [la colmena]
98. los bees [las abejas]

ID 22222315

99. el window [la ventana]
100. un hole [un hoyo]
101. un beehive [una colmena]
102. un squirrel [una ardilla]
103. los bees [las abejas]
104. del beehive [la colmena]
105. el beehive [la colmena]
106. los bees [las abejas]
107. un owl [una lechuza]
108. los bees [las abejas]
109. un rock [una roca]
110. el owl [la lechuza]
111. un rock [una roca]
112. un sound [un sonido]
113. un baby [un bebe]

Fifth Graders

ID 11131281

114. el container [la jarra]
115. el owl [el búho]
116. un reindeer [un venado]
117. el reindeer [el venado]

118. el reindeer [el venado]
119. el reindeer [el venado]
120. del log [del tronco]
121. del log [del tronco]

ID 11131283

122. del tree [del arbol]
123. una owl [una lechuza]
124. la owl [la lechuza]
125. un deer [el venado]
126. un edge [la orilla]

ID 11132198

127. el home [la casa]
128. un deer [un venado]
129. del deer [del venado]

ID 11231364

130. un hamster [un ratón]
131. del owl [del búho]
132. el owl [el búho]

ID 12131372

133. un reindeer [un venado]
134. el log [el leño]
135. los babies [los bebes]

ID 12131385

136. los bees [las abejas]*
137. lo rocks [las piedras]
138. del deer [el venado]
139. una branch [la rama]
140. el deer [el venado]

ID 12131481

141. lo bees [las abejas]
142. el racoon [el mapache]*
143. un deer [un venado]

ID 12231325

144. el frog [la rana]
145. un jar [una jarra]
146. la ground [la tierra]
147. un beehive [la colmena]
148. un plant branch [una rama]
149. el beehive [la colmena]
150. un owl [un búho]
151. un deer [la colmena]
152. la other side [el otro lado]
153. un chiquito frog [un sapo chiquito]

ID 12231361

154. un beehive [un panal de abejas]
155. del beehive [del panal de abejas]
156. del beehive [del panal de abejas]
157. el beehive [el panal de abejas]
158. un owl [un búho]
159. los bees [las abejas]
160. el owl [el búho]
161. un deer [un venado]
162. el deer [el venado]

ID 12232103

163. un frog [un sapo]
164. el frog [el sapo]
165. el frog [el sapo]
166. el frog [el sapo]
167. el frog [el sapo]
168. el bowl [el jarrón]
169. el bowl [el jarrón]

170. el bowl [el jarrón]
171. un hole [un hueco]
172. el hive [el panal]
173. un hamster [un topo]
174. el hive [el panal]
175. el hive [el panal]
176. un hole [un hueco de una mata]
177. un owl [un búho]
178. el owl [el búho]
179. el hive [el panal]
180. un rock [una piedra]
181. un deer [un venado]
182. el deer [el venado]
183. del deer [del venado]
184. el deer [el venado]
185. el deer [el venado]
186. un log [un tronco]*
187. un log [un tronco]*
188. del frog [del sapo]
189. el frog [el sapo]

ID 21132336

190. un deer [un venado]
191. el deer [el venado]
192. el deer [el venado]
193. una log [un tronco]

ID 21132422

194. del jar [del pomo]
195. del jar [del pomo]
196. el jar [el pomo]
197. el jar [el pomo]
198. el jar [el pomo]
199. una cliff [un precipicio]

ID 21232407

200. un beaver [una ardilla]

201. un deer [un venado]
202. un deer [un venado]
203. el deer [el venado]

ID 21232416

204. las bees [las abejas]
205. el owl [el búho]
206. el owl [el búho]
207. un deer [un venado]
208. el deer [el venado]
209. el deer [el venado]

ID 22131075

210. del jar [del jarrón]
211. del jar [del jarrón]
212. el jar [el jarrón]
213. una owl [una lechuza]
214. la owl [la lechuza]

ID 22131190

215. el beehive [el panal]
216. el beehive [el panal]
217. el beehive [el panal]
218. el beehive [el panal]

ID 22132056

219. el beehive [el panal]
220. un reindeer [un venado]
221. un cliff pequeñito [un precipicio]
222. un cliff pequeño [un precipicio]

ID 22232066

223. un reindeer [un venado]
224. el reindeer [el venado]
225. el reindeer [el venado]

ID 21132070

226. los beavers [los topos]

ID 22232410

227. un squirrel [una ardilla]
228. un deer [un venado]
229. los babies [los bebes]

APPENDIX B: Feminine-Marked Mixed Nominal Constructions (*n* = 27)

1. ID 11221366, 8;0, male second grader (OUTLIER CHILD)
CHI: Entonce(s) la [*] niño y la [*] perro (.) ve [ven] <una: ay > [/] una: bee [* abeja] (…) [^c] y estaba +"/.
CHI: Y entonce(s) la [*] perro ve <una: (.) una:> [/] (.) una beehive [colmena] [^c].
CHI: (En)tonce(s) la beehive [colmena] sa [: se] cae [^c].
CHI: y la [*] niño estaba ahí (.) en la: (.) tree [mata] [^c].
CHI: Todo [todas] la: [* las] bees [* abejas] y la owl [* lechuza] estaba [* estaban] ahí en la: tree [* mata] [^c].
CHI: (En)tonce(s) la owl [lechuza] sa [: se] fue [^c].
CHI: y la niño <(es)taba> [/] (es)taba ahí en la rock [piedra] [^c].
2. ID 12122132, 7;0, male second grader
CHI: Entonce(s) el niño <ponió se> [/] se ponió [encaramó en] una rock [* una piedra] [^c].
3. ID 11222078, 7;0, female second grader
CHI: <Y el y el> [/] Y el perro (es)taba sentando [sentado] [^c] a(d)mirando la: frog [* rana] [^c].
4. ID 12122022, 7;0, female second grader
CHI: (…) y el niño y el perro estaban montado(s) <entre u:na> [/] entre [en] una: wood [* un tronco] [^c].
5. ID 21121222, 7;0, male second grader
CHI: la abejas [estaban] haciendo una race [* carrera] con el perro [^c] para sting [* picarlo] [^c].
CHI: la [/] la honey bee [el panal] se cayó en el piso [^c].
6. ID 21222192, 7;0, male second grader
CHI: Y se caiga la beehive [cayó la colmena] [^c].

7. ID 22121160, 7;0, male second grader
CHI: y la frog [rana] estaba salió [* había salido] [^c].
8. ID 22222312, 7;0, female second grader
CHI: en la mañana el niño y el perro (.) um [/] vieron la [/] (.) la (.) jar [jarra] [^c].
9. ID 11131283, 11;0, male fifth grader
CHI: y entonce(s) el niño se cayó (.) [^c] <y (.) y> [/] porque salió <u:n> [/] una owl [lechuza] de [/] del árbol [^c].
CHI: entonce(s) la owl [lechuza] (.) no paraba de ir detrá(s) de [/] (.) del (.) niño [^c].
10. ID 12131385, 10;0, female fifth grader
CHI: Y entonce(s) um [/] él crea [cree] [^c] <que lo> [/] que <lo cosa> [/] lo cosa arriba del deer [* venado] es [* los cuernos son] una [/] una branch [/] branch [* rama] [^c].
11. ID 12231325, 10;0, female fifth grader
CHI: <el perro el prere> [/] el perro <um:> [/] [se] cayó (.) <cayó en la: um:> [/] en la ground [* tierra] (.) [^c].
CHI: y el niño está (acosando) el perro en <el (flag) (…) en> [/] la: other side of the [el otro lado del] (…) the [/] tree: chopped down [* árbol caído] (…) [^c].
12. ID 21132336, 11;0, female fifth grader
CHI: El niño creía [^c] que [/] que <e:l> [/] la rana está <adentro de una (.) de:> [/] (.) adentro de una: (.) log [un tronco] [^c].
13. ID 21132422, 11;0, female fifth grader
CHI: se llevó el [al] niño (.) <a (.) a un> [/] (.) a una: cliff [* un precipicio] [^c].
14. ID 21232416, 11;0, female fifth grader
CHI: cuando [mientras que] el perro estaba buscando <en el> [/] (.) [^c] adonde estaban las bees [* abejas] [^c] Michael buscaba <en el> [/] en el tronco <del del> [/] de la mata [^c].
15. ID 22131075, 10;0, female fifth grader
CHI: salió <u:na> [/] (.) Una owl [lechuza] [^c].
CHI: la owl [lechuza] le cayó atrás al niño [^c].

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