THE ACQUISITION OF GENDER:

DIFFERENCES BETWEEN MONOLINGUAL

BRAZILIAN PORTUGUESE AND

BILINGUAL PORTUGUESE-ENGLISH CHILDREN

A Thesis Submitted to the
College of Graduate and Postdoctoral Studies
In Partial Fulfillment of the Requirements
For the Degree of Master of Arts in Applied Linguistics
In the Department of Linguistics
University of Saskatchewan
Saskatoon

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ABSTRACT

This thesis reports on the results of research investigating the early acquisition of grammatical gender in Brazilian Portuguese (BP) monolingual (L1) and BP- Canadian English bilingual (2L1) children. BP has a two-gender system, with nouns being, grammatically speaking, either masculine or feminine. Canadian English does not present grammatically-gendered nouns. As such, the bilingual (2L1) acquisition of both languages raises the question of whether there will be attrition between the distinct grammatical gender systems. That is, does the acquisition of a grammatically ungendered language such as English Studies influence the acquisition of grammatical gender in the other language (in this case, BP)? Studies in monolingual gender agreement acquisition have already been conducted in Portuguese (Corrêa & Name, 2003; Correa, Augusto & Castro, 2010) and other Romance languages, but they do not account for bilingual acquisition. This is the first study to address the difference between L1 acquisition of BP and 2L1 acquisition where the other concomitant L1 does not present gendered nouns. I compare the rate of acquisition of the grammatical gender system of BP in a L1 context and in a 2L1 BP-CE context. The initial hypothesis of this research is that bilingual Brazilian Portuguese-Canadian English children will demonstrate later grammatical gender acquisition. This will result in later production of correct determiner-noun-adjective gender agreement when compared to monolingual Brazilian children. The results of this study support this hypothesis. Monolingual and bilingual acquisition were compared through elicited production tasks. In these tasks, grammatical gender was attributed to nonce nouns, and children were then asked to produce gender agreement in determiners and adjectives. The tests measured the effects of acquiring a non-gendered language (English) on children's process of acquiring and producing gender agreement in another language (BP). Bilingual children produced significantly less correct grammatical gender inflections than their similarly-aged monolingual peers. This demonstrates that bilingual children start the grammatical gender acquisition process later than their monolingual counterparts and take a longer time to master the grammatical gender system of BP completely. The data was collected in the province of Saskatchewan, Canada and in the state of Rio de Janeiro, Brazil. The participants were 23 monolingual children and 21 bilingual children, between the ages of 2.4 and 5.2 years old.

ACKNOWLEDGEMENTS

DEDICATION

I would like to dedicate this work to the many people who have supported and encouraged me in the process of completing my graduate studies, and in my life as a whole.

To my father, Ronaldo, and step/bonus mom, Aida, for your unwavering faith in me, for the comforting words in the most stressful times, and for celebrating my every success.

To Michaela, best friend and proof-reader extraordinaire, for reading and re-reading this paper, catching my countless typos, giving honest opinions and constructive criticism, for reminding me to breathe, rest and allow myself some off time, and for making me laugh when it was sorely needed.

To my friends in Brazil, thank you for supporting me through this journey, even when that means I have to miss your birthdays, weddings, graduations and special occasions. Thank you for allowing me to continue to be in your lives through the distance, and thank you for being in mine.

To my friends in Saskatoon, thank you for your friendship and warmth that has gotten me through the harsh winters. Thank you for giving me a reason to leave my apartment when it's -40 and not allowing me to hibernate for six months a year. Thank you for being my support system away from home and for the community we've built.

To Newman Sounds Glee Club, for providing me with a weekly opportunity to unwind, sing, dance and laugh with you. Thank you to Kristen for leading that group, which is a saving grace to so many of us during our post-secondary studies. And thank you to all of the group members, past and present, for the friendships formed, the shared rants, the "mandatory fun nights", and the outright cheesiness that can put musicals to shame.

To my cats, who most definitely believe they wrote this thesis for me since they are the source of all knowledge. Thank you for not keyboard-smashing, for falling for the fake keyboard trick, and for the constant cuddles and cuteness. Saskatoon would not be home without you. But please don't puke on my laptop until the final version of this work has been submitted.

TABLE OF CONTENTS

List of Tables

List of Graphs

List of Abbreviations

BP – Brazilian Portuguese
CE – Canadian English
L1 – monolingual first language acquisition
2L1 – bilingual first language acquisition
2+L1 – bilingual or multilingual first language acquisition
L2 – second (foreign) language acquisition
L2+ – second or subsequent (foreign) language acquisition
L3 – third (foreign) language acquisition
eL2 – early second (foreign) language acquisition
m. – masculine
f. – feminine
sg – singular
pl – plural
Det-masc – masculine determiner
Det-fem – feminine determiner

1. Introduction

Unlike what mainstream culture in North America might suggest sometimes, bilingualism and multilingualism are more common than monolingualism (De Bot, 1992; Grosjean, 2010; Bialystok et al., 2012). World statistics on this topic have not been gathered, but it is often estimated that at least half of the world's population is bilingual or multilingual, and this proportion is still on the rise (Wei, 2000).

This trend, verified around the world in general, can also be observed in Canada. For instance, in urban areas such as Toronto, up to 50 percent of students have a native language other than English or French, thus speaking at least one other language besides an official Canadian language (Canadian Council on Learning, 2008). In the United States, a similar situation can be observed: it is estimated that 60% of the population of Los Angeles is bilingual, for instance. In contrast, the percentage of bilinguals in rural areas tends to be around 20%. The national percentage of bilingual Americans is 27% as of 2017, but that number is also rising. (U.S. Census Bureau, 2013-2017)

Despite the prevalence of bilingualism, bilingual grammatical acquisition has been sparsely explored to date in first language (L1) acquisition research. Since bilingual L1 acquisition is a very young field of study, few decisive answers have been reached. The process of bilingual (2L1) acquisition in infants, toddlers and children, in particular, has received little attention, especially when compared to monolingual (L1) acquisition (Byers-Heinlein & Lew-Williams, 2013).

Sequential/foreign (L2+) language acquisition is also a well-explored topic, both in the realm of grammar/syntax and phonetics/phonology. Relevant acquisition models include the Speech Learning Model (Flege, 1995, 2003) and the Perceptual Assimilation Model of L2 speech learning (Best and Tyler, 2007). Both however, focus mostly on phonetics and phonology and primarily on second/foreign (L2) language acquisition, which differs from bilingual (2L1) acquisition in a few key aspects.

One prominent difference between L1 and L2 acquisition is the process through which the language is acquired by the speaker. In L1 acquisition, the language is considered to have been

acquired, per se; that is, the acquisition process happens naturally and automarically, through exposure and input. On the other hand, in L2 acquisition, the language is *learned*; that is, the process is not automatic and presupposes effort and active participation from the learner, who is not able to reproduce the language after having only environmental exposure or input.

The other key difference between L1 and L2 acquisition is precisely the reason for the difference in process. L1 acquisition happens during the first three years of a child's life, i. e. the period when the basis for language acquisition is being formed and the child's brain is first learning to process spoken language and to speak. L2 acquisition, on the other hand, happens after that period, when the basis of spoken language already exists in a child's brain.

For these reasons, early childhood 2L1 acquisition (the kind of acquisition studied in this paper) is the acquisition of two languages that happens between birth and 3 years of age. Early childhood L2 acquisition, on the other hand, is when a second language is added after the child is 3 years old, but before the teen years. These two types of acquisition follow different processes, which is why studies on early L2 acquisition do not necessarily apply to studies in 2L1 acquisition, and vice-versa.

As such, monolingual L1 acquisition (sometimes followed by foreign L2 acquisition) is still considered the norm, often leading to the incorrect diagnosis of learning disabilities and speech delays in bilingual (2L1) children (Bedore & Peña, 2008; Kohnert, 2010). Evaluating bilingual children with a measure created by research on monolingual children leads to unnecessarily overcrowding the services for students with delays in language acquisition and learning/cognitive disabilities and the lack of proper support for bilingual students.

The solution to this problem lies in better understanding the process of early bilingual language acquisition and its impact on a child's linguistic abilities and development. This understanding leads to more adequate language testing for bilingual and multilingual children, novel education methods to work around possible cross-language interference, and the development of educational systems better prepared to accommodate multicultural and multilingual children.

There is a clear gap in the current knowledge of multilingual early childhood L1 acquisition which deviates from monolingual L1 acquisition.

This study aims to partially fill that gap, adding to a small but growing body of research on bilingual first language acquisition (2L1). Specifically, this study investigates the acquisition of

grammatical gender by Brazilian Portuguese (BP) monolingual (L1) and BP-Canadian English bilingual (2L1) children to determine the effects of acquiring a non-gendered language such as English on children's process of acquiring and producing gender agreement in another language.

The 23 monolingual participating children were interviewed in Brazil, hailing from entirely monolingual families, studying in monolingual schools and living in monolingual communities. The 21 bilingual children were interviewed in Canada, being Canadian-born and having Brazilian parents, with Brazilian Portuguese as the only home language and English as the external environment language. All of them attend English-language daycares/preschools, as well as a weekly Brazilian Portuguese language school.

The results of this research show that such effects are present in the language acquisition process of the bilingual children: it takes them longer than their monolingual counterparts to internalize the grammatical gender system of Brazilian Portuguese, resulting in a later start and a later conclusion to their grammatical gender acquisition.

Studies in early childhood monolingual (L1) gender agreement acquisition in Romance languages have been conducted for Portuguese (Corrêa & Name, 2003), Spanish (Pérez-Pereira, 1991) and French (Karmiloff-Smith, 1979; Karmiloff-Smith, 1986).

Several works exist on the topic of early second language (L2) acquisition of grammatical gender. The most prominent compare Dutch learners of several different first languages (Blom, Polišenská & Unsworth, 2008), early and late English-French bilingual children (Guillelmon & Grosjean, 2001), and early learners of French as a second (L2) or third (L3) language of various first languages (Krenca, Hipfner-Boucher & Chen, 2020).

Several studies also exist on the acquisition of grammatical gender by adult second language (L2) learners. Many of those deal precisely with the pairing of English as L1 and a Romance L2 (for example, Sato, Gygax & Gabriel, 2003; Salamoura, 2007).

Some recent studies address broader language acquisition differences between monolingual (L1) children, simultaneous bilingual (2L1) children, and early sequential (eL2) bilingual children. One of those studies compares monolingual French children to Swedish-French simultaneous and sequential bilinguals (Ågren, Granfeldt & Thomas, 2014). Another study compares monolingual (L1) German children to simultaneous and sequential early learners of German with different first languages (Schulz & Grimm, 2019). In these studies, the focus is not on grammatical gender acquisition, but it is briefly mentioned.

However, a study explicitly comparing early monolingual (L1) acquisition of a language with a gender system to early simultaneous bilingual (2L1) acquisition where the other language has no gender system has not been undertaken. This thesis begins to fill this particular gap.

As shown in the cases of Dutch and French early bilinguals (Blom, Polišenská & Unsworth, 2008; Guillelmon & Grosjean, 2001), the acquisition of a language that does not contain grammatically gendered nouns (in this case, English) negatively affects the acquisition of grammatical gender in a language that does display grammatically gendered nouns. At times, these adverse effects result in severely delaying grammatical gende acquisitionr, as in late French-English bilinguals (Guillelmon & Grosjean, 2001; Blom, Polišenská & Unsworth, 2008).

Therefore, this study's central hypothesis is that bilingual Brazilian Portuguese-Canadian English children present later grammatical gender acquisition, demonstrated through later production of determiner-noun-adjective gender agreement when compared to monolingual Brazilian Portuguese children.

This hypothesis was tested through experimental means with monolingual and bilingual children in the grammatical gender acquisition phase, i.e., from 2.5 to 5 years of age (cf. Mills 1985, 1986; Bewer 2004). The children were presented with images of alien-like creatures, with each creature having a different name. A short conversation about the creatures ensued. During the conversation, the children would be elicited to produce expressions with articles and adjectives inflected for gender to agree with the creature's name.

This activity intended to elicit the production of determiner-noun-adjective expressions by the children. Their responses have been quantitatively analyzed and compared.

The paper is structured as follows: sections 2 and 3 present a review of the relevant literature, section 4 presents an overview of the grammatical gender system in Brazilian Portuguese, section 5 describes the research design, section 6 presents the results, section 7 contains a discussion of the results, and section 8 concludes the paper and presents suggestions for further research on the topic.

2. Studies in language development and acquisition

Currently, little information about bilingual and multilingual (2+L1) acquisition is available. This lack can partially be explained by the difficulties of discussing such a complex topic in general terms, rather than focusing on specific aspects. Textbooks on language development have the complex task of discussing several topics related to childhood language acquisition, and to do that in a manner which hopefully can be applied to as many languages as possible. Also, the language acquisition field is very young with most of the research during the 20th century focusing on establishing monolingual language acquisition.

Gleason & Ratner (2013), for instance, barely discuss inflectional morphology. In a chapter entitled "Putting words together", countless topics are covered, from how two-word utterances are formed to infinite clauses; the few paragraphs dedicated to morphology briefly mention declensional languages and verbal conjugation but makes no mention of grammatical gender inflection.

Bilingual language acquisition is covered in two paragraphs that present bilingualism as a possible factor in the variation of language acquisition. It lists the different bilingualism types and comments on the scarce research on the topic. It affirms that the existing research is mostly focused on the patterns of development in the language of bilingual children, while "there is less research studying the rate of development. Insufficient research and methodological problems make it difficult to find a conclusive answer to the question of whether bilingual children develop their languages at rates similar to monolinguals" (Gleason & Ratner, 2013:255).

Indeed, the lack of research and conclusive answers in bilingual language acquisition is a pervasive theme. Hoff (2014) devotes a full chapter to childhood bilingualism, addressing topics ranging from the social circumstances that lead to bilingualism to bilingual children's education during their school years. When discussing simultaneous bilingual language acquisition, the author mentions that bilingualism can produce effects on the course and rate of language acquisition – keyword, in this case, being *can*.

It is mentioned that the specific languages acquired by each child and individual differences between children and their exposure to each language can influence the bilingual language acquisition process (Hoff, 2014). Precisely, those factors can determine how and to what extent the acquisition of one language influences the acquisition of the other.

More recent studies conclude that bilingual L1 acquisition of each individual language has a somewhat slower rate than L1 acquisition by monolingual children.

Ågren, Granfeldt & Thomas (2014) focuses on the early acquisition of French and Swedish, comparing the acquisition of several grammatical features by monolingual French-speaking children with simultaneous and sequential Swedish-French bilinguals. Although grammatical gender is not one of their main studied grammatical features, they briefly mention it as a problem area for bilingual children.

Polinsky (2018) devotes an entire book to the study of heritage languages. She addresses the social impact of migrations, focuses on acquisition and maintenance of heritage languages and current challenges faced by learners of heritage languages and their teachers. Gender, plural, case, and verbal conjugation are discussed as some of the most challenging areas for heritage language learners to master. However, no conclusions are made about whether those difficulties come from cross-language interference and what practical effects can be seen in the grammar of heritage language speakers.

Schulz & Grimm (2019) looks into the differences between monolingual acquisition of German versus simultaneous and sequential 2L1 acquisition of German combined with several other languages. It is a comprehensive analysis covering many grammatical and syntactic features; grammatical gender is only briefly mentioned.

Thus, there is an extensive research gap in the study of grammatical gender acquisition in a childhood 2L1 context, especially regarding how the acquisition rates of each individual language compare to those of monolingual language acquisition. It is precisely in this gap that the current study is situated.

This study examines the effects of simultaneous bilingualism (2L1) in the rate of acquisition of one specific area of grammar. Grammatical gender inflection proves to be an appropriate choice for the task, seeing its system in each language is very different. While Portuguese grammatically inflects articles, pronouns, adjectives, and determiners to agree with nouns, English does not have

grammatically gendered nouns and thus does not demonstrate grammatical gender in agreement inflection.

3. Studies in grammatical gender acquisition

3.1 Monolingual (L1) acquisition

The research on childhood language acquisition under a nativist view (Chomsky, 1972) has been, for the most part, an innovation from the second half of the 20th century. Early acquisition of inflectional morphology has been a very prolific topic since then, perhaps due to it being easy to measure, especially for English with its reduced inflectional morphology (Brown, 1973).

One of the first studies on grammatical gender acquisition, which still inspires much of the current research on the topic, was developed by Karmiloff-Smith (1986). This study was an extension of previous research (Karmiloff-Smith, 1979), which developed a functional approach to child language acquisition. A functional approach to linguistics concerns itself mainly with the function of language, that is, what language does regarding people's ability to communicate and how it is used in a given context. Functional linguistics generally derive textual, grammatical, and syntactic information from how language is used, rather than focusing on formal structures in isolation.

By administering several verbal and non-verbal tasks to children of different age groups, Karmiloff-Smith (1979) found a connection between the process of learning how to perform motor tasks and the process of acquiring language. This conclusion offered insight into the childhood language acquisition process and inspired further research on the topic.

Karmiloff-Smith (1986) focused on trying to gauge how much of the language acquisition process was conscious. In its essence, the conducted experiment was a *Wug test* for gender. Working with monolingual French-speaking children aged 4-5, 6-7, and 8-9, the study used activities to elicit the production of utterances containing definite or indefinite articles and possessive pronouns, which are inflected to agree with the gender of the noun they accompany in French. The activities consisted mainly of presenting children with nonce words and creating dialogues, which would lead the participating children to use articles and pronouns in conjunction with the novel nouns.

Afterwards, the children were asked to explain why they had picked the specific inflections they utilized. The study showed that, while the 4 to 5-year-olds were able to produce all inflections correctly, they could not explain their reasoning for doing so. In fact, this capacity seemed to develop after the acquisition of the grammatical gender system, since it requires meta-linguistic awareness. In the study, only the oldest group was able to verbalize the reasons for their choices.

Although the focus of Karmiloff-Smith (1986) is different from the focus of the many subsequent studies in grammatical gender acquisition (e.g. Pérez-Pereira, 1991; Guillelmon and Grosjean, 2001; Correa and Name, 2003), the elicited production model proved effective in measuring children's capacity to produce grammatical gender inflections. Thus, it has inspired the methodology of the aforementioned studies and the present study.

Mills (1986) gathered data from previous naturalistic diary studies of German children's monolingual acquisition between the age of two and ten years. She collected production data of several linguistic elements, including gender inflectional morphology.

The grammatical gender system in German differs from the one found in most Romance languages, as it consists of a three-gender system: masculine, feminine and neuter. Despite this difference, Mills (1986) follows Karmiloff-Smith (1979) regarding the age of grammatical gender acquisition. Most of the observed children produced isolated errors after their third birthday, the presence of incorrect inflections slowly decreased, and, by their fifth birthday, there were virtually no more errors. The findings thus informed the age-selection for the children participating in the present study of both Karmiloff-Smith (1979) and Mills (1986).

Pérez-Pereira (1991) conducted an elicited production experiment based on the methodology of Karmiloff-Smith (1986) with 160 monolingual Spanish-speaking children between the ages of 4 and 11. The objective was to test the relative strength of different types of clues in children's recognition of a noun's gender and the consequent production of gender inflection. The utilized clues were either semantic (the biological sex), morphophonological (whether the ending of a word is more common in masculine or in feminine nouns, or equally common in both), or syntactic (whether the determiners accompanying a noun are inflected in the masculine or the feminine).

This study found that semantic factors are weakest. Most children ignore a being's biological sex when it does not match the morphophonological and syntactic clues. For example, a male creature could be called Teca (thus, presenting the *-a* ending most commonly associated with

feminine nouns) and referred to with feminine determiners and adjectives. In this case, most children were able to differentiate between biological sex and grammatical gender, thus referring to Teca with feminine inflections despite Teca being biologically male.

The syntactic factor proved to be the strongest. Younger children were occasionally confused when a noun had a typically masculine ending with feminine-inflected determiners) and vice-versa (i.e. Buco, with the most commonly masculine -*o* ending, but accompanied by feminine determiners. However, at five years old, children would consistently identify the gender of a noun according to the grammatical inflections used with it.

Not only do these findings present further confirmation that the acquisition of grammatical gender is usually fully completed at around five years of age, but they also demonstrate that children are sensitive to the inflectional morphology related to grammatical gender to determine the grammatical gender of nouns. This information was fundamental for the design and analysis of the present experiment.

Two significant influences for the present study are Correa and Name (2003) and Correa, Augusto & Castro (2010) on the monolingual acquisition of grammatical gender in Brazilian Portuguese. Correa and Name (2003) utilize the elicited production model seen in both Karmiloff-Smith (1986) and Pérez-Pereira (1991). The study attempted to verify how morphophonological factors in nouns and determiners inform a child's identification of grammatical gender and processing of determiner-noun agreement

For this purpose, the experiment in Correa and Name (2003) was conducted with two groups of monolingual Brazilian children: the first group had children between 2 and 3 years of age, while the second group had children between 4 and 5 years of age. The children were presented with novel nouns ending in -*a* (most commonly correlated to feminine nouns), -*o* (most commonly correlated to masculine nouns), and -*e* (not specifically correlated to either gender). These nouns were accompanied by determiners inflected in either gender, so that each child would encounter positive correlation (i.e. noun ending in -*a* with feminine inflection and vice versa), negative correlation (i.e. noun ending in -*o* with feminine inflection and vice versa) and neutral correlation (i.e. noun ending in -*e* with both masculine and feminine inflections).

The results provided important information. Firstly, it could be demonstrated that children can distinguish between the ending's function in nouns and the ending's function in determiners. Children were able to determine that the ending of a noun does not always correctly predict its

gender. At the same time, they recognized that the ending of a determiner always correlates to the gender of the noun it accompanies in Portuguese. These findings demonstrate that even children who have not reached school age and consequently do not have the metalinguistic grammatical knowledge necessary to identify and name different morphophonological categories are capable of identifying differences in use and function between nouns and determiners.

Secondly, the children's performance in the positively correlated determiner-noun expression (i.e. feminine nouns ending in *-a* and masculine nouns ending in *-o*) was similar to that in the neutrally-correlated pair (i.e. both feminine and masculine nouns ending in *-e*). These findings demonstrate that a correlation between the ending of the noun and the noun's grammatical gender is not necessary for the establishment of gender agreement.

Then, it can be concluded that grammatical gender identification is a result of processing gender agreement between the determiner and the noun. As such, the acquisition of the grammatical gender system is completed as soon as the child can extract the morphological information from the determiner and use it to identify the noun's grammatical gender.

The present study is very much informed by Correa and Name (2003). The use of nouns with different endings and their positive, negative, and neutral co-relation to the inflection of the determiners was replicated in the current experiment. This method excludes the possibility that the results might have been influenced by the ending of the nouns rather than the inflection of the determiners. The specific details of this model (and how it controls for those variables) will be further explored in section 5.3.

Therefore, Correa and Name (2003)'s methodology formed the basis for the present study. Their findings and conclusions regarding the process of grammatical gender acquisition in Brazilian Portuguese provided the theoretical standard for this study, according to which children's acquisition of the grammatical gender system was analyzed.

An extension of Correa and Name (2003) was conducted to account for the possible influence of the biological sex in the ascription of gender to novel nouns. Correa, Augusto and Castro (2010) performed a similar experiment to the one present in Correa and Name (2003), but utilized novel animate nouns and animate creatures, instead of inanimate ones, which had been used previously.

Correa and Name (2003) conducted the experiment with inanimate nouns, which allowed the researchers to test morphophonological factors while excluding any possible interference from

biological sex. Once the results from this study were available, they provided a baseline for the exclusive interference of morphophonological factors. Correa, Augusto & Castro (2010) built on that baseline to investigate whether the biological sex of animate beings would alter the results found by Correa and Name (2003).

Their results indicate that determiner-noun agreement is still the prevailing factor children take into account when identifying the gender of a noun and producing the corresponding gender inflection. However, children were occasionally confused by incongruences between the grammatical gender of the noun and the biological sex of the animate creature. Utilizing a feminine noun and feminine inflection to refer to a male creature (and vice-versa) could lead children to produce incorrect agreement.

Reproducing Correa, Augusto & Castro (2010) to compare bilingual children's performance to that of monolingual children would be the next logical step to the present study. That could determine whether incongruences between grammatical gender and biological sex affect bilingual children's agreement production in the same way and measure they affect monolingual children.

Brito (2015) looked into the production of grammatical gender agreement in Portuguese by English speakers, concluding that it is a topic that can be of difficult acquisition. However, this study was conducted with adults acquiring Portuguese as a second or subsequent language (L2+). As such, their methods and results are not readily comparable to those seen in the present study, which focuses on bilingual English-Portuguese acquisition (2L1) in young children.

3.2 Bilingual acquisition

As mentioned in Section 1, studies on bilingual language acquisition are still less common than those on monolingual language acquisition, primarily due to it being a newer field of study (Byers-Heinlein & Lew-Williams, 2013). As a consequence, studies focusing on the bilingual acquisition of grammatical gender are even rarer. Also, the overabundance of possible language combinations means that there are still many research gaps to be filled.

Guillelmon & Grosjean (2001) conducted one of the first studies in bilingual grammatical gender acquisition, comparing the performances of early/simultaneous and late/sequential English-French bilinguals. All the participating children had English-speaking parents and resided in France, being exposed to both languages. However, whereas the first group had been born in France

and received French input since birth, the second group had moved to France in early childhood, initiating the reception of French input before their fourth birthdays but not at birth.

The hypothesis was that early bilinguals would outperform sequential bilinguals when producing gender agreement in French since they would have had more contact with a gendered language. The results proved the hypothesis correct and showed that many of the late bilinguals seemed to ignore grammatical gender information completely.

Guillelmon & Grosjean (2001) investigated the interaction between the gender system of a Romance language and the virtually nonexistent one in English. However, they do not answer the question of whether bilingual children acquire the grammatical gender system of the Romance language at the same rate as monolingual children or not.

The differences between simultaneous and sequential acquiring bilinguals motivated the decision to include only simultaneous Portuguese-English bilinguals in this study. Guillelmon and Grosjean (2001) demonstrated that sequential bilingualism further hinders the acquisition process of gender, which would have added an additional factor in the comparison between monolinguals and bilinguals for this study. This decision will be further discussed in section 5.2.

Blom, Polišenská, and Weerman (2008) compared monolingual Dutch-speaking children to Moroccan children and adults learning Dutch as a second language, testing their production of gender-inflected articles and adjectives. The Moroccan children and adults had Moroccan Arabic as their first language. While Moroccan Arabic has two grammatical genders, masculine and feminine, only feminine words are morphophonologically marked for gender.

Their results showed that the errors produced by the L2 adults were different from the ones produced by all the children (L1 and L2), implying that their processing of grammatical gender information might be different. The Moroccan children (aged between 4 and 8 years old) produced the same kind of errors as their monolingual counterparts in the same age range but in greater quantity. There was no explicit information about the actual acquisition rate and whether it differed between the monolinguals and the sequential bilinguals. However, a greater number of errors at the same age indicates a slower acquisition rate by bilingual children.

Drawing from Blom, Polišenská, and Weerman (2008), Blom, Polišenská, and Unsworth (2008) examine the production of grammatical gender agreement by monolingual Dutch-speaking children, simultaneous bilingual children, sequential bilingual children, and adult learners of Dutch. The bilinguals and L2 learners were of several different backgrounds, speaking several

different languages. Although the findings were inconclusive when it comes to the influence of age in grammatical gender acquisition, it was observed that the simultaneous and sequential bilingual children whose other language also has gender agreement achieved the closest results to the monolingual children.

The more similar the other language's gender system was to the Dutch gender system, the better learners of all ages performed. This study corroborates the hypothesis that not only is there cross-language interference in the acquisition of grammatical gender, but the mere existence of grammatical gender agreement in a language helps acquire another language's gender system. Thus, it can be inferred that the non-existence of grammatical gender inflection in English would negatively affect people attempting to learn a gendered language. This inference is precisely the hypothesis that the current study investigates. L1 acquisition of Canadian English (a language with no grammatical gender inflection) simultaneously with L1 acquisition of Brazilian Portuguese (a language with two grammatical genders) will negatively affect the acquisition of grammatical gender in Brazilian Portuguese.

Montanari (2014) is based on interactions between the researcher and 17 children between the ages of 5 and 6, including elicited production tasks and free speech. All of the children are simultaneous L1 bilingual learners of German, but the second language is different. By that age, monolingual German-speaking children identify the gender of nouns and correctly produce the corresponding agreement. In contrast, out of the 17 bilingual children investigated by Montanari (2014), only three were able to identify the gender of nouns when asked, and none produced gender agreement in spontaneous speech.

Although the existence or non-existence of grammatical gender in the children's other languages seemed irrelevant, the bilingual learners encountered more difficulties acquiring grammatical gender than their monolingual counterparts. Montanari (2014) affirms that the bilingual children will not have completed the gender acquisition process by age 6, whereas monolingual children generally have completed the process by that age. There is, however, no attempt to predict at what age they will have completed the process or whether the will complete the process at all since the goal of the study was simply to investigate whether multilingual children in that age range produced grammatical gender agreement comparable to that of monolingual children.

Krenca, Hipfner-Boucher & Chen (2020) looked into accuracy in determiner-noun gender agreement in a French immersion context. The study involved three groups, each containing 15 children. The first group contained children learning French as a third language (L3), whose first language marked grammatical gender. The second group contained children learning French as a third language (L3), whose first language did not mark grammatical gender. The third group contained children learning French as a second language (L2) who has English as their first language (L1).

The study's goal was to investigate the effect of linguistic proximity on the acquisition of determiner-noun grammatical gender agreement. An interesting finding was that there was no difference in the proportion of correctly marked masculine nouns between the three groups. On the other hand, the production of correctly marked feminine nouns significantly different: the group of children whose first language marked gender produced significantly more correctly marked feminine nouns than the other two groups.

While the combination of these studies provides several pieces of information about the bilingual acquisition of grammatical gender, some of the results could be interpreted as contradictory. For instance, Blom, Polišenská, and Weerman (2008) concluded that the acquisition of languages with grammatical gender influences the acquisition of languages without grammatical gender, and vice versa. On the other hand, Montanari (2014) concluded that the presence of grammatical gender in one language did not affect the acquisition of gender in the other. Furthermore, the rate of bilingual language acquisition compared to the rate of monolingual language acquisition has not yet been extensively explored.

3.3 Hypothesis and research questions

At this time, there have been no studies comparing monolingual (L1) acquisition of Portuguese to simultaneous bilingual (2L1) acquisition of Portuguese and English with regards to grammatical gender. Guillelmon and Grosjean (2001), Blom, Polišenská, and Weerman (2008), and Montanari (2014) seem to suggest that even simultaneous bilinguals would present a slower rate of acquisition than their monolingual counterparts, but this hypothesis has yet to be tested.

The main research question guiding this paper, thus, was whether the bilingual (2L1) acquisition of a grammatically ungendered language such as English Studies influences the

acquisition of grammatical gender in the other language (in this case, Brazilian Portuguese), possibly leading to a later and slower acquisition process. Furthermore, if this influence is verified, will it present itself in a similar manner in the acquisition of both grammatical genders if Brazilian Portuguese, or will one grammatical gender be more affected than the other?

The present study, thus, attempts to fill this gap by comparing the rates of grammatical gender agreement acquisition of monolingual (L1) Brazilian Portuguese-speaking children to those of bilingual (2L1) Portuguese-English-speaking children. The existing literature in grammatical gender acquisition, discussed in sections 2 and 3, indicates that the acquisition of English will most likely influence the acquisition of the grammatical gender system in Brazilian Portugues.

For this reason, the working hypothesis in this study is that bilingual (2L1) children will exibit slower acquisition of the grammatical gender system of Brazilian Portuguese when compared to their monolingual (1L1) counterparts. This would be reflected both in starting the acquisition process later and in progressing more slowly through it, and thus, also finishing that process noticeably later than the monolingual children.

4. The grammatical gender system in Brazilian Portuguese

The grammatical gender system in Brazilian Portuguese is similar to that of most other Romance languages. It is a bipartite system, that is, it constitutes of two grammatical genders: masculine and feminine. Every noun, whether animate or inanimate, has grammatical gender[1].

For the most part, the grammatical gender of animate nouns corresponds to the biological sex. For instance, *menino 'boy'* is a masculine noun and *menina 'girl'* is a feminine noun; *homem 'man'* is a masculine noun and *mulher 'woman'* is a feminine noun; *gato 'male cat'* is a masculine noun and *gata 'female cat'* is a feminine noun; *cavalo 'horse'* is a masculine noun and *égua 'mare'* is a feminine noun. For nouns that can refer to animate beings of both biological sexes, the grammatical gender is arbitrary. For instance, *pessoa 'person'* and *criança 'child'* are feminine nouns, whereas *indivíduo 'individual', n.* is a masculine noun. All inanimate nouns have arbitrary intrinsic grammatical gender, e. g. *mesa 'table'* is a feminine noun, *chão 'floor'* is a masculine noun (Ribeiro, 2003).

Determiners are inflected to agree with the gender of the noun they modify, both in the singular and in the plural, seeing as plural nouns maintain their gender. For instance, one would say *o menino 'the boy'* and *os meninos 'the boys*', but *a menina 'the girl'* and *as meninas 'the girls'*.

Adjectives are inflected for gender when they end in *-o* and *-a*, as seen in (1).

(1)   a.   ***o***   *gat-**o***   *bonit-**o***
                the-m.sg cat-m.sg   beautiful-m.sg
                'the beautiful male cat'
        b.   ***o**-s*   *gat-**o**-s*   *bonit-**o**-s*

---

[1] In regards to the demonstrative pronouns *isto 'this thing'(near the speaker)*, *isso 'this thing' (near the addressee)*, and *aquilo 'that thing'*, it is important to note: a) they are not nouns, but pronouns, which constitutes a different morphological category in BP; b) although semantically neutral and derived from grammatically neuter pronouns in Latin, BP does not have a neuter grammatical gender, so these demonstrative pronouns are grammatically masculine. When accompanied by determiners/adjectives/complements, those receive masculine inflection. E.g.: *isso mesmo 'that exact thing'*.

the-m.pl cat-m.pl   beautiful-m.pl
        'the beautiful male cats'
    c. ***a***   *gat-**a***   *bonit-**a***
        the-f.sg cat-f.sg   beautiful-f.sg
        'the beautiful female cat'
    d. ***a**-s*   *gat-**a**-s*   *bonit-**a**-s*
        the-f.pl cat-f.pl   beautiful-f.pl
        'the beautiful female cats'

They are invariable in regard to gender when they end in *-e* or in a consonant, as in (2).

(2) a. ***o***   *menin-**o***   *inteligente*
        the-m.sg boy-m.sg   intelligent-sg
        'the intelligent boy'
    b. ***o**-s*   *menin-**o**-s*   *inteligente-s*
        the-m.pl boy-m.pl   intelligent-pl
        'the intelligent boys'
    c. ***a***   *menin-**a***   *inteligente*
        the-f.sg girl-f.sg   intelligent-sg
        'the intelligent girl'
    d. ***a**-s menin-**a**-s inteligentes*
        the-f.pl girl-f.pl intelligent-pl
        'the intelligent girls'

.

Some determiners, pronouns, and participial phrases follow the same paradigm, with *-a* endings always denoting feminine inflection and agreement, and *-o* endings always denoting masculine inflection and agreement (Bechara, 2006). Others, however, due to phonological and extra-linguistic changes, have an *-e* ending in their masculine form, but maintain the *-a* ending in the feminine form. The system is summarice in table 4.1 with the most common determiners and pronouns.

Table 4.1 – Common determiners and pronouns in Brazilian Portuguese

	Definite articles	**Indefinite articles**	**Personal pronouns (3rd person)**	**Demonstrative determiner and pronoun "this"**	**Demonstrative determiner and pronoun "that"**
Masculine singular	o	um	ele	esse	aquele

Masculine plural	os	uns	eles	esses	aqueles
Feminine singular	a	uma	ela	essa	aquela
Feminine plural	as	umas	elas	essas	aquelas

It is also important to note that the masculine grammatical gender and, consequently, masculine inflection and agreement is considered the default in Brazilian Portuguese, as in most Romance languages (Perini, 2010). The masculine forms of articles, adjectives, pronouns, etc. are the ones found in dictionaries, and the ones usually taught and learned first, with the feminine inflection being seen as a simple change in ending from the masculine default. Also, groups of nouns of mixed grammatical genders are accompanied by masculine determiners (3).

<div>

(3) a. *o-s menin-o-s e a-s menin-a-s brasileir-o-s*
     the-m.pl boy-m.pl and the-f.pl girl-f.pl Brazilian-m.pl
     'the Brazilian boys and girls'

  b. **o-s menin-o-s e a-s menin-a-s brasileir-a-s*
     the-m.pl boy-m.pl and the-f.pl girl-f.pl Brazilian-f.pl
     'the Brazilian boys and girls'

</div>

Two main factors are responsible for the status of the masculine gender as the norm. The first one is of a purely grammatical and morphological nature: in most Romance languages, the number of masculine nouns is much higher than that of feminine ones. This discrepancy is a direct consequence of the morphophonological similarities between the masculine and neuter endings in Latin. Like all Romance languages (except for Romanian, which has retained the three-gender system, thus having feminine, masculine and neuter grammatical genders) retained only the masculine and feminine grammatical genders, the nouns which used to be grammatically neuter in Latin became masculine (Corbett, 1991), thus skewing the balance between grammatical genders.

The prevalence of masculine nouns is the most likely cause of the tendency to assign ungendered novel and borrowed nouns the masculine gender in all Portuguese varieties unless they have an exact correspondent (Rocha, 2008). That is, nouns borrowed from other Romance

languages tend to maintain the grammatical gender they have in their language of origin. A typical example would be the word *chaise*, which is used in Portuguese after having been borrowed from French. Since it is a feminine noun in French, it also became a feminine noun in Portuguese.

However, nouns borrowed from English, which has no gender, will be masculine in Portuguese unless they clearly correspond to an already-existing feminine word. For instance, both *web* and *net* have been incorporated into the Portuguese lexicon due to their technological meanings. As such, their only uses in Portuguese are as a synonym for *internet*. Even so, they can be literally translated into the Portuguese words *teia* and *rede* respectively, both of which are feminine nouns. As such, both *web* and *net* are considered feminine nouns in Portuguese. On the other hand, nouns like *flash-drive* and *skate*, which have no Portuguese correspondence, are automatically incorporated into the lexicon as masculine (Rocha, 2008).

The second factor influencing the notion of masculine as the default gender is more ideological. Although already present in Latin and inherited by most Romance languages, this is not exclusive to this language family. It is based on so-called grammatical or linguistic sexism. Much could be discussed on this topic – and much has already been discussed; however, seeing as that is not the main focus of this study, a brief summary of the issue is sufficient.

In short, grammatical sexism is the result of most languages in the Indo-European family having been developed in societies in which men held positions of political and social power (Spender, 1980; Monteagudo, 2010). This developmental context had quite a few consequences, the most relevant to the present study being the prestige of the masculine versus the feminine, and the use of the masculine as general and the feminine as specific (Roca, 1992; Mäder, 2015).

As men had more prestige and higher social status than women, referring to men in the feminine was considered highly offensive – as it still is to this day, hence many offensive expressions aimed at men, including a comparison to girls. For women, though, being referred to in the masculine supposedly elevated them to the same status as men, at least in the context of a specific utterance. For instance, calling a boy *menininha 'little girl'* is the same as saying he is weak, whiny or a coward; on the other hand, calling a girl *menininho 'little boy'* means that she is very active or adventurous, a tomboy. Similarly, to offend a woman, *puta 'prostitute'* is the most common term; to offend a man, however, the most common term is *filho da puta 'son of a prostitute'*, which is still more offensive of his mother than of the man himself.

Also, a group containing women and men had to be referred to in the masculine, as men would be offended to be referred to in the feminine (Wilson, 1979).

Freire (1992), for example, having discussed at length the effects of sexism in language production and their contribution to the oppression of women, aptly summed the issue up in one question. "When I say 'men', women are included; why, then, do men not feel included when we say 'women'?" (Freire, 1992, p. 35).

As it stands, masculine inflections are more common in Brazilian Portuguese than feminine inflections. There are more masculine nouns than feminine nouns, and masculine inflections are used to refer to male-only and mixed-sex groups. On the other hand, feminine inflections are used exclusively to refer to female-only groups.

Consequently, young learners of Brazilian Portuguese receive more exposure to masculine nouns and inflections than to feminine nouns and inflections. This discrepancy in exposure contributes to the earlier processing of masculine grammatical gender and inflection. In the context of formal education, masculine forms and inflections are taught first, as a basis, and feminine forms and inflections are taught as an alteration or derivation of the masculine norm (Câmara, 1972; Bechara, 2006).

Plural inflection for determiners of plural nouns is also combined with gender inflection (4).

(4) a. ***A***   *menin-**a***   *alt-**a***   *está*   *cansad-**a**.*
         The-f.sg   girl-f.sg   tall-f.sg   is   tired-f.sg
         'The tall girl is tired.'

     b. ***O***   *menin-**o***   *alt-**o***   *está*   *cansad-**o**.*
         The-m.sg   boy-m.sg   tall-m.sg   is   tired-m.sg
         'The tall boy is tired.'

     c. ***A**-s*   *menin-**a**-s*   *alt-**a**-s*   *estão* *cansad-**a**-s.*
         The-f.pl   girl-f.pl   tall-f.pl   are   tired-f.pl
         'The tall girls are tired.'

     d. ***O**-s*   *menin-**o**-s*   *alt-**o**-s*   *estão* *cansad-**o**-s.*
         The-m.pl   boy-m.pl   tall-m.pl   are   tired-m.pl
         'The tall boys are tired.'

As illustrated in (4), the most common ending for feminine nouns is *-a*, whereas the most common ending for masculine nouns is *-o*. Thus, it is likely that a noun ending in *-a* is feminine and a noun ending in *-o* is masculine. That general rule is not devoid of exceptions, however. For instance, *dia 'day'* is a masculine noun even though it ends in *-a*, and will, thus, be accompanied by masculine-inflected determiners and Adjectives. On the other hand, *tribo 'tribe'* is a feminine noun even though it ends in *-o*, and receives feminine-inflected determiners and adjectives.

Nouns are inflected based on their grammatical gender. Therefore, when inflected for plural, masculine plurals are used for masculine nouns and feminine plurals for feminine nouns (5).

(5) a. ***o*-s   *dia*-s   *long-o*-s**
         the-m-pl day-m-pl long-m-pl
         'the long days'

     b. ***a*   *tribo*   *estrangeir-a***
         the-f.sg   tribe-f.sg   foreign-f.sg
         'the foreign tribe'

Nouns that do not end in either *-a* or *-o* also exist and can be of either grammatical gender (Bechara, 2006). The inflection of the corresponding determiners, in those cases, also follows the grammatical gender of the noun they determine, the same way as in the previous examples.

Children acquiring Brazilian Portuguese as a native language will usually learn the gender of each noun as it enters their vocabulary. In adult language, nouns are typically accompanied by at least one determiner (most often a definite or indefinite article), from which children can infer the grammatical gender of the noun. It is also important to note that masculine and feminine inflections are the only two possibilities in BP: there is no uninflected article, pronoun, etc. As such, every determiner is necessarily inflected therefore provides a grammatical gender clue for the accompanying a noun.

For the clue to be acknowledged, the child must have already understood the process behind the grammatical gender system in Brazilian Portuguese, i.e. the child must have already internalized the agreement relationship between determiners and grammatical gender. Thus, the child must know that determiners ending in *-a* always accompany grammatically feminine nouns (regardless of the ending of the noun) and determiners ending in *-o* always accompany grammatically masculine nouns (regardless of the ending of the noun).

Levy (1988) affirms that studies conducted for several languages have concluded that, by the age of 3, most monolingual children are already generally able to distinguish gender classes, regardless of how complex the gender system in their native language is. At that age, monolingual children acquiring languages with grammatical gender agreement still exhibit agreement errors in their speech, mostly in novel or non-obviously grammatically gendered nouns; by the age of 4, however, those errors tend to have disappeared completely (Mills, 1985, 1986; Bewer, 2004). Specifically, in Brazilian Portuguese, the average age in which monolingual children no longer produce agreement errors seems to be around 3.5 years old (Correa & Name, 2003; Correa, Augusto & Castro, 2010).

Thus, grammatical gender acquisition is the acquisition of the capacity to understand the agreement relation of grammatical gender between determiners and nouns. This understanding enables the child to subsequently infer the gender of unfamiliar nouns.

As such, a Brazilian Portuguese-speaking child is considered to have completely acquired the grammatical gender system of Brazilian Portuguese when they can immediately infer whether a noun is masculine or feminine by extracting that information from the determiners that accompany it, even if they have never encountered that noun before. As a consequence, they should no longer produce any agreement errors[2].

It is the ability to infer the grammatical gender of a never-encountered noun from the information provided by the determiners that this study attempts to explore in both monolingual and bilingual children. This way, it can be determined whether that acquisition process occurs at similar or differing rates in both groups. The experimental approach is an effective way to target this ability, as pure production data and errors cannot always provide conclusive evidence for grammatical gender acquisition. Only through testing unfamiliar nouns can it be determined if the child has mastered the gender system by applying correct gender agreement between determiners and nouns (Karmiloff-Smith, 1986; Ambridge and Rowland, 2013)

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[2] This also accounts for nouns with endings most commonly found in the opposite grammatical gender, eg. feminine nouns ending in *-o* and masculine nouns ending in *-a*. The information in the determiners is what indicates the gender of the noun, even when the ending is most commonly found in the opposite grammatical gender. The complete acquisition happens when children can hear, for instance, *o dia 'the day'* and understand that it is a masculine noun even though it ends with *-a*, because the determiner *o 'the'* is masculine.

5. Methodology

5.1 Location

The methodology of the present study was inspired by previous studies on the topic (Karmiloff-Smith; 1979; Karmiloff-Smith, 1986; Pérez-Pereira, 1991; Guillelmon and Grosjean, 2001; Correa and Name, 2003), as discussed in sections 3 and 4, considering the intention of making the results comparable to those in order to add to the corpus of early grammatical gender acquisition. This experiment, and the others which preceded it, follows a classic *Wug-test* setup (Berko, 1958), used for paradigmatic morphology since its creation.

Since the goal was to compare monolingual Brazilian Portuguese-speaking children to bilingual BP and English-speaking children, the experiment was carried out in two different locations: Rio de Janeiro, Brazil and Saskatchewan, Canada.

The data collection in Brazil happened during September 2018 in three schools located in three middle-class neighbourhoods in Rio de Janeiro. The data collection in Saskatchewan happened during October and November 2018 in Brazilian communities in Saskatoon and Regina.

5.2 Subjects and recruitment

The 44 participants (23 monolingual children and 21 bilingual children) were recruited from middle-class families to control other variables besides location and lingualism status, such as socioeconomic status and parents' education level. All the participating children in both countries were enrolled in daycare or pre-school and with no history of speech or developmental delays.

The age range of all the participants was 2.4 to 5.2 years old, as this is often understood as the age range for gender acquisition in Romance languages (Karmiloff-Smith, 1979; Mills, 1986).

In Brazil, the schools provided help in selecting the participants by screening for students who met the criteria of the research (middle-class, in the approximate age range of 2.5 to 5 years old, monolingual speakers of Brazilian Portuguese, with no speech or developmental delays) and

who were likely to be willing to participate in the experiment. After this selection, there were a total of 23 monolingual children participating in the experiment.

In Saskatchewan, participants were recruited through the Brazilian language school in Saskatoon and the Brazilian communities in Saskatoon and Regina. Teachers at the language school also helped in the selection process, and parents often referred other parents whose children might meet the criteria for the study. A total of 21 bilingual children were included in the experiment.

Also for the sake of neutralizing other variables such as the amount of input, place of birth and age of first contact with English as much as possible, all bilingual children included in this study are simultaneous and mostly balanced bilinguals, born in Canada to Brazilian parents, with Brazilian Portuguese as the home language and English as the daycare/pre-school language, as well as the language of most interactions outside of the immediate family.

Simultaneous bilingualism occurs when children start being addressed in two spoken languages before the age of two years old and continue to be regularly addressed in those languages until the final stages of language development, circa five years old. When simultaneous bilingualism occurs, both languages are acquired as first languages (2L1) (de Houwer, 1995). Since all of the participating children had external interactions with family friends, play dates, and started attending daycare before the age of 2, this is the case for the 21 participating bilingual children.

Children born in Canada to Brazilian parents tend to have contact with Brazilian Portuguese since birth, being simultaneous bilinguals. Children born in Brazil to English-speaking parents would also be simultaneous bilinguals. Brazilian children who have moved to Canada at a young age would be sequential bilinguals in which the second language is English. That would not provide information about the acquisition of Brazilian Portuguese following that of English. Thus, the only group of sequential bilinguals that could be included in the research would be children from English-speaking countries who had moved to Brazil. However, the availability of participants from this group is extremely limited, which would prevent their inclusion in the present research.

5.3 Procedures and materials

The interviews were conducted individually with each child, to avoid the possibility of one child's answers influencing another's. All the interviews were conducted in Brazilian Portuguese. There

was no video recording; the audio of the interviews was recorded with the "Voice Memos" application in an iPhone 7, in .m4a format.

The experiment itself was developed based on the previous research experiments conducted on the topic (Karmiloff-Smith, 1979; Pérez-Pereira, 1991; Guillelmon and Grosjean, 2001; Correa and Name, 2003). I compiled a list of eighteen nonce words – words that do not exist in the Brazilian Portuguese vocabulary, but are phonologically possible in the language. Out of those words, six of them had the most common ending for masculine nouns in BP (-o), six had the most common feminine ending in BP (-a), and six had different endings which occur with similar frequency in both genders (-e, -l, -r, for instance). The complete list of words can be found in Appendix A.

The choice to include words with different endings was inspired by Correa & Name (2003). Their use of different endings which correlated positively, negatively and neutrally to the inflection of determiners was reproduced in the present study. The main advantage of this methodological choice is that it controls for the possibility that the results might have been influenced by the ending of the nouns, rather than by the inflection of the determiners.

Seeing as *-a* is the most common ending for feminine nouns and *-o* is the most common ending for masculine nouns, utilizing nouns ending in *-a* only with feminine determiner inflections and nouns ending in *-o* only with masculine determiner inflections would not offer enough information. It could be argued that instead of following the determiner's inflection, children are guided by the ending of the noun by using feminine inflections for nouns ending in *-a* and masculine inflections for nouns ending in *-o*.

Det-masc+Noun-o

Det-fem+Noun-a

Utilizing nouns ending in *-o* with both feminine and masculine determiner inflections makes it possible to verify whether children will utilize masculine determiner inflections for all of them by being guided by the word ending, or whether they will follow the specific determiner inflection utilized by the researcher for each word.

Det-masc+Noun-o

Det-fem+Noun-o

Utilizing nouns ending in *-a* with both feminine and masculine determiner inflections controls for the same issue and for the possibility that the masculine determiner inflections are being used as the default.

Det-masc+Noun-a

Det-fem+Noun-a

That is, if children utilize masculine determiner inflections for all the words ending in *-o*, it could be argued that their response was motivated by utilizing masculine as the default, rather than by the usually masculine word ending. If children also inflect all the words ending in *-a* in the masculine, that would indicate that they use masculine as the default. On the other hand, if they inflect all the words ending in *-a* in the feminine, that would suggest they were guided by the word ending. And if instead, they utilize feminine determiner inflections with the words presented by the researcher as feminine and masculine determiner inflections with the words presented by the researcher as masculine, that would mean the deciding factor was the gender information provided by the determiners.

Furthermore, the utilization of words ending in other letters such as *-e*, *-r* and *-l* makes it possible to observe the children's performance when there is no gender information in the noun itself, seeing as those endings occur with similar frequency across both genders. In those cases, the only grammatical gender information comes from the determiner.

Det-masc+Noun-e

Det-fem+Noun-e

Det-masc+Noun-r

Det-fem+Noun-r

Det-masc+Noun-l

Det-fem+Noun-l

This setup controls for the possibility that the negative correlation between the noun ending and the inflection of the determiner influences the children's responses to the previous categories (*-a* and *-o*).

For example, if children perform worse when presented with nouns ending in *-o* accompanied by feminine determiners or nouns ending in *-a* with masculine determiners, they probably use the noun ending rather than the determiner inflection as clue. Also, it could be argued

that their performance was hindered merely because the determiner and the noun had different properties, thus confusing the children. Utilizing nouns with endings not commonly associated with either gender thus controls for the influence of correlation (either positive or negative) between noun-ending and determiner gender inflection. Table 5.1 provides a summary of the different ending and determiner combinations used, as well as their possible outcomes and explanations.

Table 5.1 – Ending and determiner combinations and outcomes

	Masculine inflection produced	Feminine inflection produced
Noun ending in -*o* + masculine determiners	Could be explained by using masculine as the default, by following the noun ending, or by following the gender indicated by the determiner	Could not be explained by following any information (there was no instance of this outcome)
Noun ending in -*o* + feminine determiners	Could be explained by using masculine as the default, or by following the noun ending	Could only be explained by following the gender indicated by the determiner
Noun ending in -*a* + masculine determiners	Could be explained by using masculine as a default, or by following the gender indicated by the determiner	Could only be explained by following the noun ending
Noun ending in -*a* + feminine determiners	Could only be explained by using masculine as the default	Could be explained by following either the noun ending or the gender indicated by the determiner
Noun ending in -*e* or consonants + masculine determiners	Could be explained by using masculine as the default, or by following the gender indicated by the determiner	Could not be explained by following any information (there was no instance of this outcome)

Nouns ending in *-e* or consonants + feminine determiners	Could only be explained by using masculine as the default	Could only be explained by following the gender indicated by the determiner

As can be seen from all the possible combinations and explanations in the table above, the consistent production of feminine inflections with the words presented by the researcher as feminine and of masculine inflections with the words presented by the researcher as masculine indicates that the deciding factor was, in fact, the gender information provided by the determiners.

For data collection, eighteen images of cartoon-style alien-like creatures were developed to be presented to the children during the interviews (examples of the images can be found in Appendix B). I made two copies of each creature and coloured each of them in a different colour. Each of the eighteen creatures then received a name: a word from the nonce word list. Each image was printed and then glued to a popsicle stick, to act like puppets the child could interact with.

During the interviews, each child was introduced to the creatures, one pair at a time, and invited to interact with it, talk about it, talk to it, pet it, make it walk, etc. The choice for an elicited production model was made both because that was the method of most of the previously mentioned studies on childhood grammatical gender acquisition, and because this is considered to be the most efficient method when investigating a specific grammatical element in children's speech (Blom & Unsworth, 2010; Ambridge & Rowland, 2013).

The decision to utilize nonce words also came both from following the previous studies' models on the topic and from what is currently considered the best practice for early childhood language acquisition research (Eisenbeiss, 2010; Quené, 2010; Ambridge & Rowland, 2013).

Since many language acquisition research studies focus on how children process language, it is essential that their language production reflects their processing capacity at that moment and not a previously acquired knowledge. As such, using words that the children might have encountered before would mean that their language production might be aided by memory rather than be a result of having mastered the rules for gender agreement at the time the interviews are conducted.

Therefore, it is crucial to make sure that the words utilized in early childhood language acquisition research are entirely new to the participating children. Seeing as there is no way to compile each child's entire exposure to vocabulary, using existing words in the child's language

would be risking the possibility that a participant might have previously encountered a given word. Thus, the surest way to guarantee that all the words children are presented with are unknown to them is by utilizing nonce words specifically for the elicited production tasks.

The conversations usually followed scripts, similar to those in (6) and (7) with minimal variation.

(6.1) a.   *Ess-e   é   o   Poca.   El-e   é   vermelh-o.*
                This-m.sg is the-m.sg Poca-m.sg. He is red-m.sg
                'This is Poca. He is red.'

      b.   *Ess-e   é   outr-o   Poca. El-e   é   amarel-o.*
                This-m.sg is another-m.sg Poca. He is yellow-m.sg
                'This is another Poca. He is yellow.'

      c.   *Vamos   cobrir   ess-e   Poca?*
                Will we   cover   this-m.sg   Poca?
                'Let's cover this Poca?*'*

      d.   *Qual Poca nós   cobrimos?*
                Which Poca we   covered?
                'Which Poca did we cover?'

(6.2) a.   *Ess-a   é   a   Poca.   El-a   é   vermelh-a.*
                This-f.sg is the-f.sg Poca-f.sg. She is red-f.sg
                'This is Poca. She is red.'

      b.   *Ess-a   é   outr-a   Poca. El-a   é   amarel-a.*
                This-f.sg is   another-f.sg Poca. She is yellow-f.sg
                'This is another Poca. She is yellow.'

      c.   *Vamos   cobrir   ess-a   Poca?*
                Will we   cover   this-f.sg   Poca?
                'Let's cover this Poca?*'*

      d.   *Qual Poca nós   cobrimos?*
                Which Poca we   covered?
                'Which Poca did we cover?'

(7.1) a.   *Ess-e   é   o   Mipe. El-e é   rox-o.*
                This-m.sg   is   the-m.sg Mipe. He is   purple-m.sg
                'This is Mipe. He is purple.'

      b.   *Ess-e   é   outr-o   Mipe. El-e   é   branc-o."*

30

| | | This-m.sg is | another-m.sg Mipe. He | | is | white-m.sg |

This-m.sg is   another-m.sg Mipe. He   is   white-m.sg
'This is another Mipe. She is white.'

c. *De qual   del-e-s   você   gosta   mais?*
Of which   them-m.pl   you   like   more?
'Which of them do you like best?'

(7.2) a. *Ess-a   é   a   Mipe. El-a   é   rox-a.*
This-f.sg   is   the-f.sg Mipe. She   is   purple-f.sg
'This is Mipe. She is purple.'

b. *Ess-a   é   outr-a   Mipe. El-a   é   branc-a."*
This-f.sg is   another-f.sg Mipe. She   is   white-f.sg
'This is another Mipe. She is white.'

c. *De qual   del-a-s   você   gosta   mais?*
Of which   them-f.pl   you   like   more?
'Which of them do you like best?'

If the child did not answer (or answered non-verbally, i.e. by pointing), prompting questions were asked, e. g. *De qual cor? 'Which colour?'*, *Qual é esse? 'Which one is this-m.sg?'*/*Qual é essa? 'Which one is this-f.sg?'*.

Each child was presented with all eighteen creatures and words. The odd-numbered children (first, third, fifth, etc., in the order they were interviewed) were introduced to words 1 to 3 in each category as male creatures and words 4 to 6 in each category as female creatures. On the other hand, the even-numbered children were introduced to words 1 to 3 in each category as female creatures and words 4 to 6 in each category as male creatures.

This procedure accounts for individual word differences and controls the possibility of certain words sounding more masculine or more feminine. If the same words were presented to every child as masculine or feminine, it could be argued that results were influenced by the difference in the specific masculine and feminine words. With half of the children being introduced to a given word as masculine and the other half as feminine, any noticeable difference in answers can be attributed to the gender inflection process, instead of the sound of each word.

After all the interviews had been conducted, the audio recordings were then used to count the number of correct inflections each child produced. Each inflection was considered correct or incorrect, depending on whether it matched the one used by the author when introducing the

creature to the child. If the creature was introduced to the child as a female with the use of feminine determiners, a feminine inflection would be considered correct, and a masculine inflection would be considered incorrect. If the creature was introduced to the child as a male with masculine determiners, a masculine inflection would be considered correct, and a feminine inflection incorrect.

6. Results

The general hypothesis that guided this study was that the bilingual children acquire the grammatical gender system at a slower rate than their monolingual counterparts. Specifically, this difference in the acquisition rate was expected to result in the bilingual children producing fewer correct inflections than the monolingual children. This hypothesis was, indeed, supported by the results of the experiment.

For the statistical analysis, both the bilingual and the monolingual groups were divided into two subgroups based on age. This separation into subgroups is necessary since the experiment's goal was to test for acquisition rates by age. As aforementioned, the average age by which monolingual BP speakers have fully acquired the ability to process and produce gender agreement in novel nouns is circa 3.5 years old (Correa & Name, 2003). Therefore, children under 3.5 were in Group 1 (4 bilinguals and 7 monolinguals) and children over 3.5, in Group 2 (17 bilinguals and 16 monolinguals).

Thus, it was possible to compare the results of the bilingual children to the ones of the monolingual children as a whole, and also to compare each age group.

- Group 1 bilinguals versus group 1 monolinguals
- Group 2 bilinguals versus group 2 monolinguals
- Group 1 versus group 2 monolinguals
- Group 1 versus group 2 bilinguals

The main dependent variable investigated was the total amount of correct inflections produced by each child (out of the 18 nonce words presented to them). It also proved interesting to look into the amount of correct masculine inflections and correct feminine inflections produced by each child, out of 9 words for each grammatical gender. As mentioned in chapter 4, masculine and feminine nouns and inflections receive different treatment and appear with different frequencies in Brazilian Portuguese. As such, it was possible that children's results would reflect these differences – as was, verified.

The results were analyzed through a generalized mixed-effects model in R x64 3.5.2, using the *glmer* function of the *lme4* package. Ninety-five percent confidence intervals (CI$_{95}$) were computed using the *confint* function from the *lmerTest* package. The model included speaker as the random effect, and the number of correct inflections (levels 0-18) as the dependent variable. Age group (1 or 2) was a fixed effect, with Group 1 included in the intercept. Lingualism (Bi or Mono) was the final fixed effect, with monolingualism being included in the intercept due to its status as the norm.

The model-building phase also tested interactions between predictors, and non-significant predictors were removed from the model until only significant predictors remained. Notably, this was the case of Sex (M or F) of the participating children, which was initially added as a fixed effect, but turned out to be a non-significant predictor, and was then removed from the model. The reported model does not contain any non-significant predictors. The reasons for this will be further explored in section 7.5.

Two other models were also run, differing from the model as mentioned above only in the dependent variable. One has the number of correct masculine inflections as the dependent variable (levels 0-9), and one has the number of correct feminine inflections as the dependent variable (levels 0-9).

The hypothesis was that the bilingual children would produce significantly fewer correct determiner inflections than their monolingual counterparts of similar age. This difference would demonstrate that the concomitant acquisition of Brazilian Portuguese with English negatively affects the rate of acquisition of the grammatical gender system for bilingual children.

That hypothesis is supported by the statistical analysis of the collected data. When comparing the number of correct inflections per group and lingualism, monolinguals in Group 1 produced a statistical average of 12.7 correct inflections (β=12.7, S.E.=0.59, CI95=11:13, t=21.4, p<.001) out of 18 possible inflections, amounting to 70.56%. Bilinguals in Group 1, on average, produced 4.6 less correct inflections than their monolingual counterparts (β=-4.6, S.E.=0.56, CI95=-5:-3, t=-8.4, p<.001), which amounts to an average of 8.1 correct inflections, or 45%.

Group 2 produced, on average, 4.7 more correct inflections than their counterparts (β=4.7, S.E.=0.65, CI95=3:5, t=6.9, p<.001). As such, monolinguals in Group 2 produced an average of 17.4 correct inflections (96.67%), whereas bilinguals in Group 2 produced an average of 12.8 correct inflections (71.11%), both out of 18 total inflections.

To summarize, the Monolingual G1 presents the intercept in this model, at an average 12.7 correct inflections. Being in G2 adds 4.7 to the average, whereas being bilingual subtracts 4.6. Thus, the aforementioned results are reached: Monolinguals in G1 at an average of 17.4 correct inflections (12.7+4.7); Bilinguals in G1 at an average of 8.1 correct inflections (12.7-4.6); and Bilinguals in G2 at an average of 12.8 correct inflections (12.7+4.7-4.6). As such, bilinguals are trailing behind monolinguals by almost 5 correct inflections, which effectively puts the bilinguals in G2 at virtually the same spot as monolinguals in G1.

Table 6.1 – Correct inflections per group

	Estimate of correct inflections (out of 18 total inflections)	Std. Error	2.5%	97.5%	t-value	pr(>|t|)
Monolinguals Group 1 (Intercept)	12.7	0.59	11	13	21.4	<.001
Bilinguals Group 1	8.1 (i.e. -4.6 from intercept)	0.56	-5	-3	-8.4	<.001
Monolinguals Group 2	17.4 (i.e. +4.7 from intercept)	0.65	3	5	6.9	<.001
Bilinguals Group 2	12.8 (i.e. +4.7 from bilingual G1)	0.65	3	5	6.9	<.001

Even considering each lingualism group as a whole (i.e. all bilinguals versus all monolinguals, regardless of age group), the average of correct inflections produced by the bilinguals is inferior to that of the monolinguals, at 11.8 and 15.9, respectively.

Bilinguals vs. Monolinguals
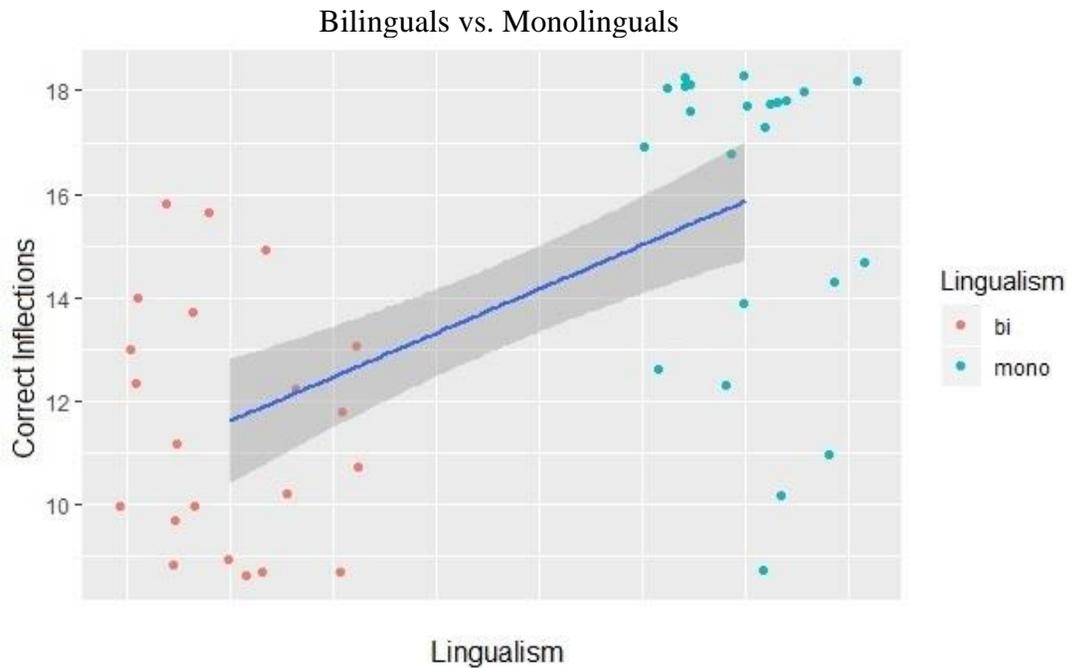
Graph 6.1 – Correct Inflections per Lingualism Status

When we examine the monolingual and the bilingual children separately, it is possible to observe the progression between age groups 1 and 2, with each child represented by a dot, and the estimated marginal means of each group being indicated by a line.
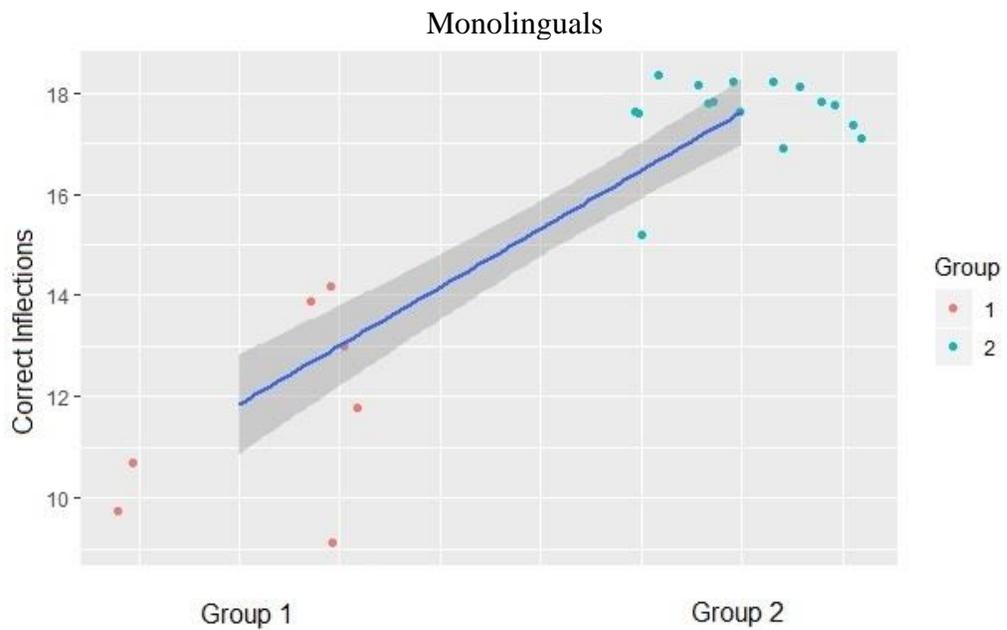
Monolinguals

Graph 6.2 – Correct Inflections for Monolinguals in Groups 1 and 2

Bilinguals

Graph 6.3 – Correct Inflections for Bilinguals in Groups 1 and 2

As can be seen, the increase in the number of correct inflections from Group 1 to Group 2 is a lot more pronounced with the monolinguals than with the bilinguals. This indicates that, in the monolingual group, the older children produced noticeably more correct inflections than their younger counterparts, whereas in the bilingual group, the difference in production between the younger and the older children was not as pronounced.

In terms of rate/speed of acquisition, the steeper increase in the monolingual group demonstrates that their grammatical gender acquisition process happens faster than that observed in the bilingual group.

Another meaningful comparison is the one between monolinguals and bilinguals within each age group, with bilingual children represented individually by red dots on the left and monolingual children represented individually by blue dots on the right, and the estimated marginal means indicated by a line:

Group 1

Graph 6.4 – Correct Inflections for Bilinguals and Monolinguals in Group 1
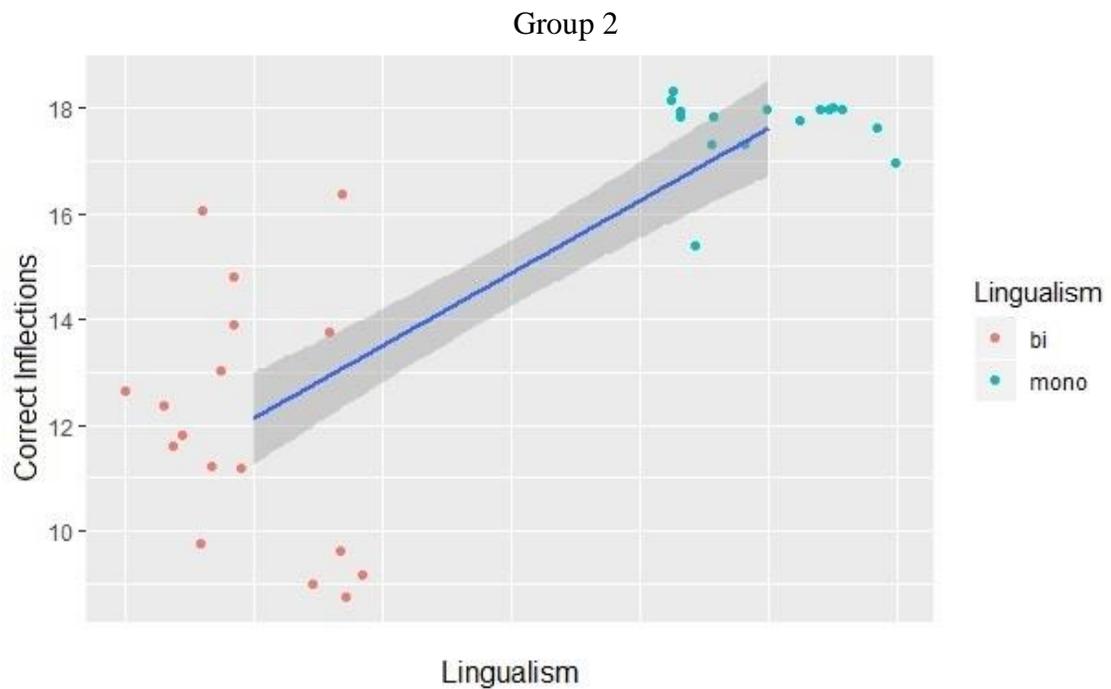
Group 2

Graph 6.5 – Correct Inflections for Bilinguals and Monolinguals in Group 2

These graphs show that the distribution of the dots is not uniform across the lingualism and age groups. Graph 6.4, depicting the younger children, has both sets of dots mostly scattered, even

though there are three monolingual children grouped in the top right corner. In graph 6.5 that depicts the older children, the bilingual group also has mostly scattered dots, whereas the monolingual group is, for the most part, concentrated on the top right corner.

Graphing the number of correct inflections produced by all participating children, while marking both their age group and lingualism status, also provides an excellent visual guide for the different distributions of correct inflections produced across the board.

Graph 6.6 – Correct Inflections for Groups 1 and 2, highlighting Lingualism Status

In Graph 6.6, it is possible to see even more clearly that, whereas the monolingual children in Group 2 present a very uniform distribution in the top right corner, all the remaining groups (monolinguals in Group 1, bilinguals in Groups 1 and 2) are noticeably more scattered. Whereas all monolingual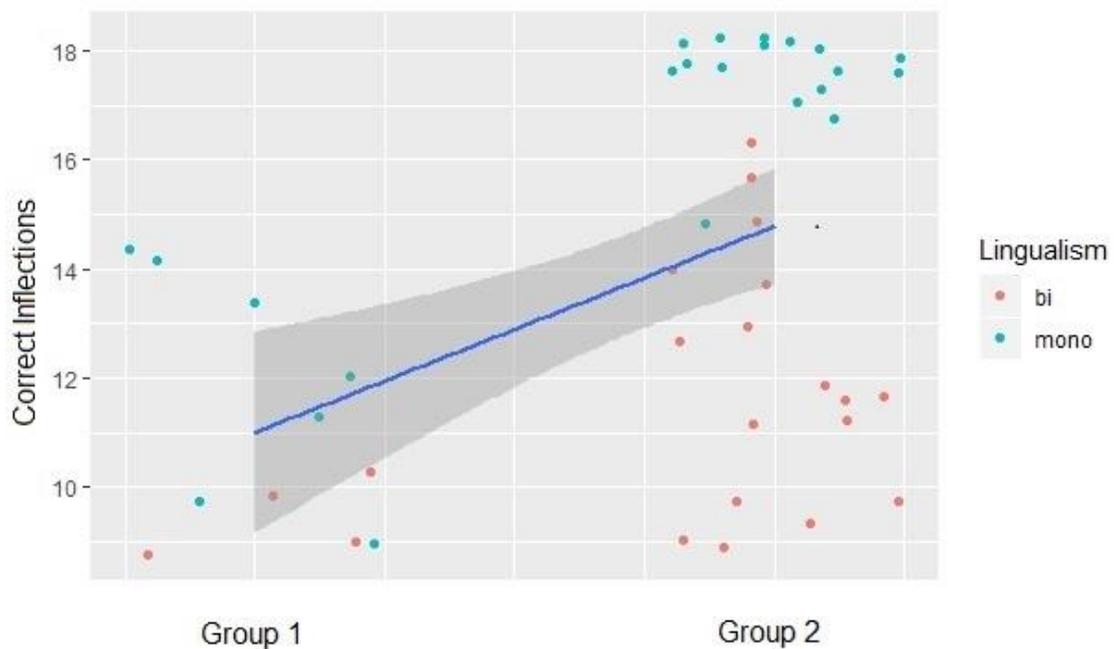s in Group 2 uniformly produced a high amount of correct inflections, the three other groups are formed by children who produced varying amounts of correct inflections. These specific distributions within the groups will be commented in more detail in section 7.4.

Therefore, whereas monolinguals in Group 2 performed almost flawlessly, the bilinguals in that age group were still far from achieving results compatible with full grammatical gender acquisition. In fact, as previously mentioned, the result of the older bilinguals is very similar to the one produced by the younger monolingual group. This comparison can be best visualized in Graph

6.7, which shows the marginal means of correct inflections produced by monolinguals and bilinguals across each age group. The second point of the blue line, representing bilinguals in Group 2, nearly overlaps with the first point of the red line, representing monolinguals in Group 1
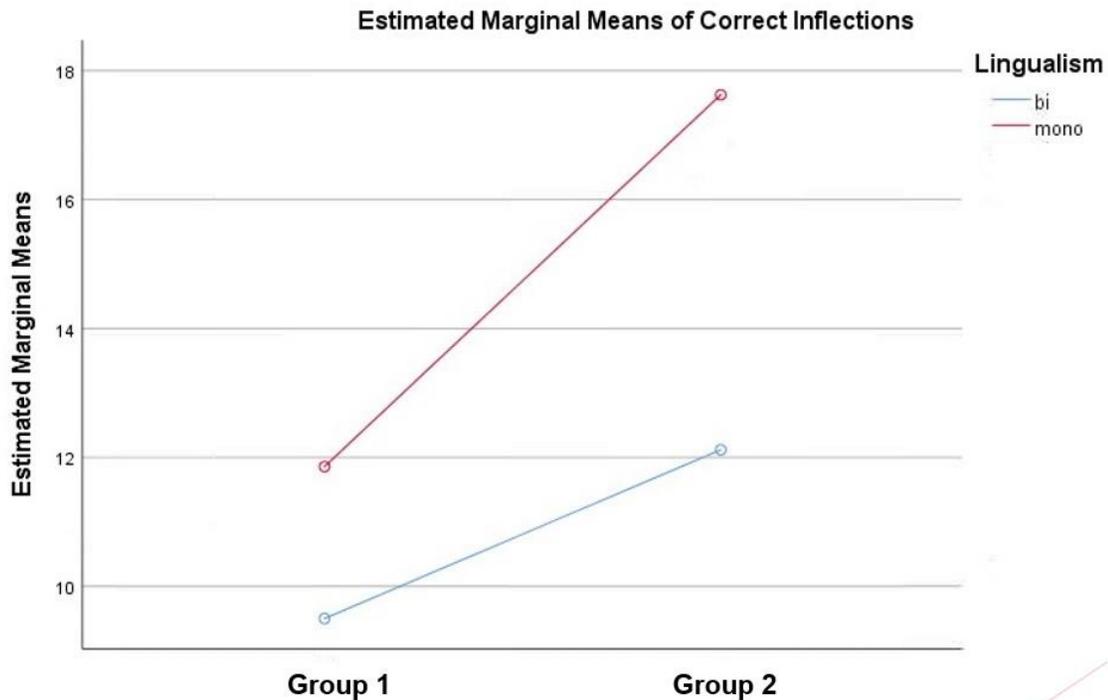
Graph 6.7 – EMM of correct inflections per group, for both Monolinguals and Bilinguals

As previously mentioned, out of the 18 nonce words presented to the children, 9 of them were accompanied by masculine determiners and the other 9, by feminine determiners. As such, it is also essential to look into masculine and feminine inflections separately.

The masculine inflections presented a very interesting result: the mean number of correct masculine inflections was 8.9 out of 9 possible correct masculine inflections (β=8.9, S.E.=0.06, CI95=8:9, t=131.6, p<.001), amounting to a correctness rate of 98.88%. No factors showed significant effects in the number of correct masculine inflections, i. e. neither age group nor lingualism status significantly influenced the amount of correct masculine inflections produced. The reasons for this will be further explored in section 7.5.

Regarding the feminine inflections, however, a very different scenario was observed. The average number of correct feminine inflections for monolinguals in Group 1 was 4.2 (β=4.2, S.E.=0.59, CI95=2:5, t=6.4, p<.001), out of 9 possible correct inflections, amounting to 46.67% of

correct feminine inflections. Bilinguals in group 1 produced, on average, 3.8 less correct feminine inflections than their monolingual counterparts (β=-3.8, S.E.=0.56, CI95=-6:-3, t=-8.7, p<.001). That amounts to an average of only 0.4 correct feminine inflections, out of 9 possible ones, or 4.45%.

Group 2 produced, on average, 3.9 more correct feminine inflections than their younger counterparts (β=3.9, S.E.=0.65, CI95=3:5, t=6.7, p<.001). As such, monolinguals in Group 2 produced an average of 8.1 correct feminine inflections (90%), whereas bilinguals in Group 2 produced an average of 4.3 correct feminine inflections (47.78%), still out of a possible 9 correct feminine inflections.

Table 6.2 – Correct feminine inflections per group

	Estimate (out of 9 total feminine inflections)	Std. Error	2.5%	97.5%	t-value	pr(>|t|)
Monolinguals Group 1 (Intercept)	4.2	0.59	2	5	6.4	<.001
Bilinguals Group 1	0.4 (i.e. -3.8 from intercept)	0.56	-6	-3	-8.7	<.001
Monolinguals Group 2	8.1 (i.e. +3.9 from intercept)	0.65	3	5	6.7	<.001
Bilinguals Group 2	4.3 (i.e. +3.9 from bilingual G1)	0.65	3	5	6.7	<.001

As was the case with the total number of correct inflections, breaking the groups down per lingualism status and age group offers valuable insight.
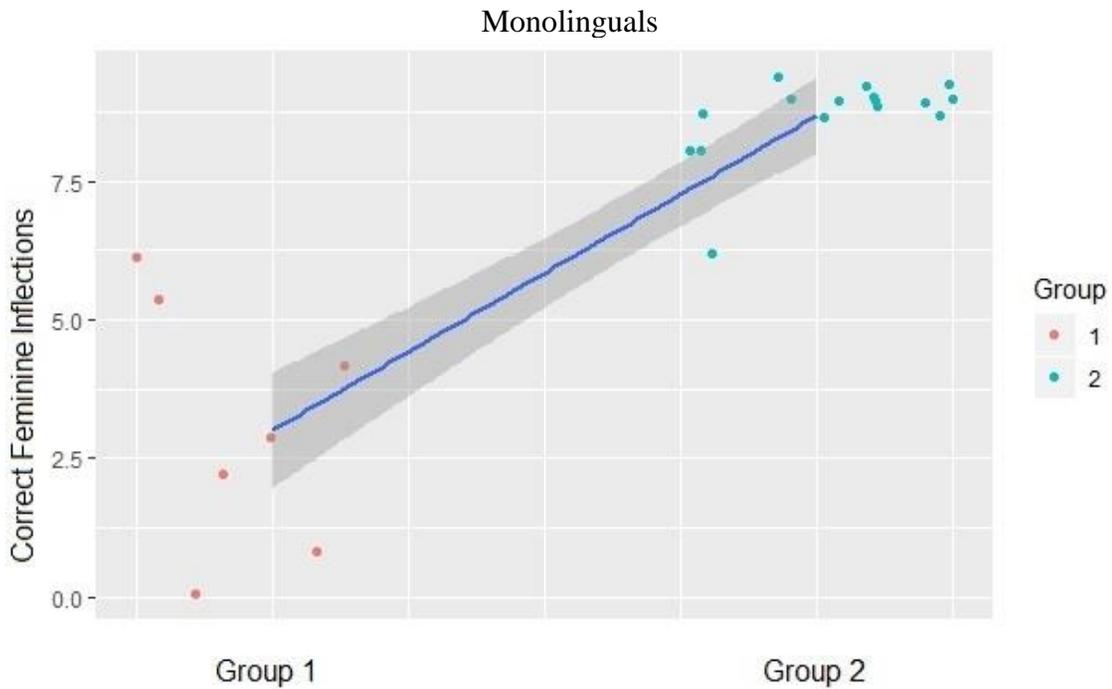
Graph 6.8 – Correct Feminine Inflections for Monolinguals in Groups 1 and 2

Graph 6.8 shows that the younger monolinguals (Group 1) produced between 0 and 6 correct feminine inflections, whereas the older monolinguals (Group 2) produced between 6 and 9 correct feminine inflections. This result is directly correlated to that observed in Graph 6.2. The younger monolinguals produced between 9 and 15 total correct inflections and the older monolinguals, between 15 and 18. Removing the 9 correct masculine inflections from those numbers would produce precisely the result observed in Graph 6.8.
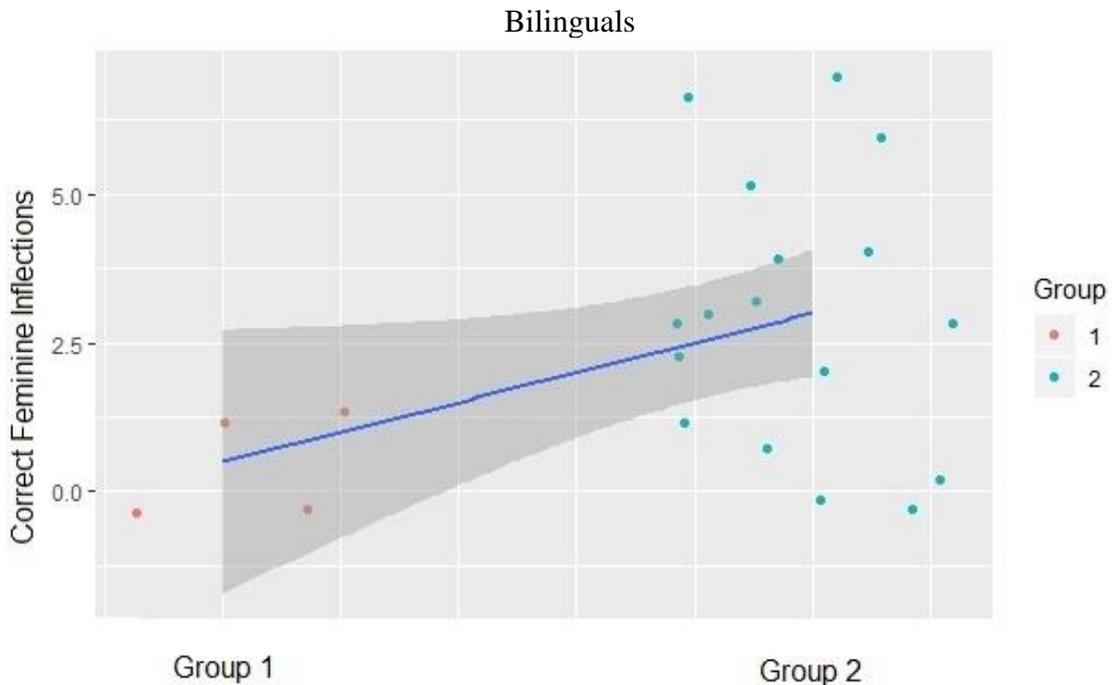
Graph 6.9 – Correct Feminine Inflections for Bilinguals in Groups 1 and 2

Graph 6.9, depicting the correct feminine inflections produced by all bilingual children, shows that the four younger ones produced either none or one correct feminine inflection. The older ones produced between 0 and 7 correct feminine inflections. These numbers also correlate to the ones found in Graph 6.3. In 6.3, the total number of correct inflections for bilinguals in Group 1 was either 9 or 10, and ranged between 9 and 16 for Group 2. Thus, the total of correct inflections for each individual child is the sum of the 9 correct masculine inflections plus the correct feminine inflections.

Comparing Graph 6.8 to Graph 6.2 and Graph 6.9 to Graph 6.3, there are many similarities between monolinguals' total results and feminine inflection results, and also between bilinguals' total results and feminine inflection results. The same trends that were seen in the total number of correct inflections are also present here. The older monolinguals performed pronouncedly better than their younger counterparts, whereas the older bilinguals performed just slightly better than their younger peers.

Within the two age groups, comparing the numbers of correct feminine inflections produced by the bilingual children to the ones produced by the monolingual children also presents a similar result to the one observed in the total number of correct inflections. The monolingual children in Group 1 produced an estimated mean of only 2.5 more correct feminine inflections than the

bilinguals. In contrast, the monolinguals in Group 2 produced an estimated mean of 4.5 more correct feminine inflections than their bilingual counterparts. These results will be further discussed in section 7.3.
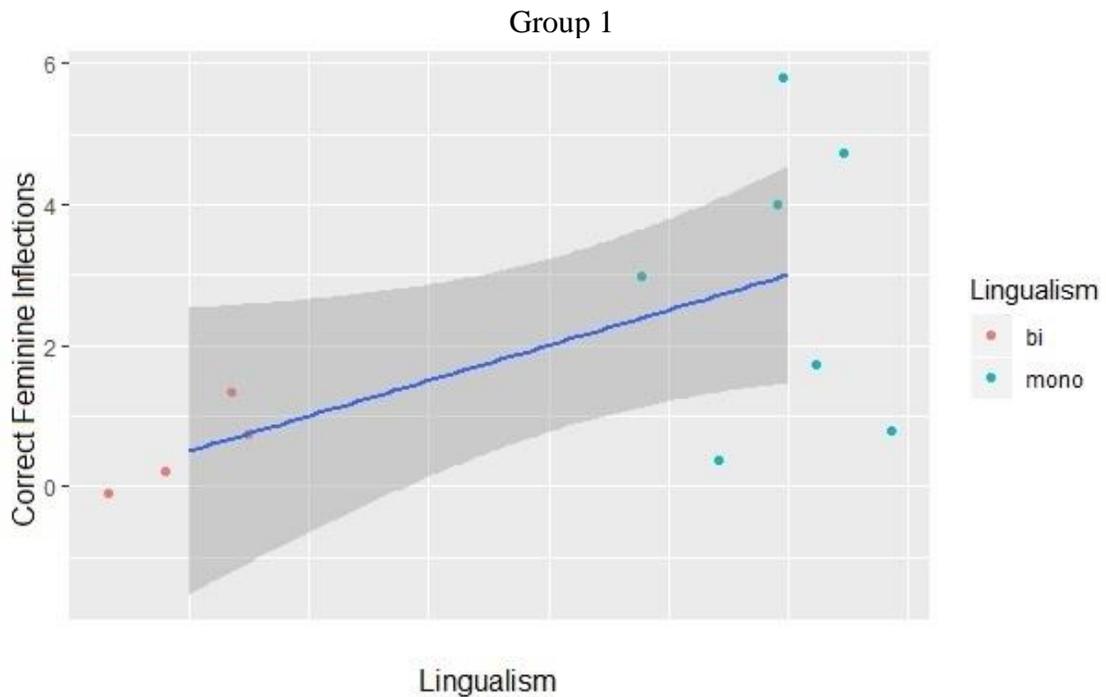
Graph 6.10 – Correct Feminine Inflections for Bilinguals and Monolinguals in Group 1

Graph 6.10 shows the difference in the production of correct feminine inflections between the younger bilinguals and the younger monolinguals. It is analogous to Graph 6.4, which shows the total correct inflections by the younger bilinguals and monolinguals. Once more, the sum of the correct feminine inflections (0 or 1 for the bilinguals, 0 to 6 for the monolinguals) plus the 9 correct masculine inflections equals the number of correct inflections produced by each child (9 or 10 for the bilinguals, 9 to 15 for the monolinguals).

Group 2

Graph 6.11 – Correct Feminine Inflections for Bilinguals and Monolinguals in Group 2

Graph 6.11 presents the correct feminine inflections produced by the older bilinguals and monolinguals. While the older bilinguals produced between 0 and 7 correct feminine inflections, the monolinguals produced between 6 and 9. Comparing these results with the ones present in Graph 6.5, it is possible to see their correlation. The older bilinguals produced between 9 and 16 total correct inflections, while the older bilinguals produced between 15 and 18 total correct inflections. Again, it is clear that the number of total correct inflections produced by each child is simply the total number of masculine inflections (9) plus the number of correct feminine inflections produced by that same child.

As mentioned at the beginning of the present chapter, models were also run including children's gender as an independent variable, to investigate any significant difference between boys' and girls' answers. In all models, however, gender variation turned out to be non-significant, the reasons for which will be explored further in section 7.5.

In short, the hypothesis that the bilingual children acquired the Brazilian Portuguese grammatical gender system more slowly than the monolingual children was supported by the results. The number of correct inflections produced by the children was utilized as the criterion to measure how far along in the gender acquisition process they were. The results demonstrated that

the younger bilingual children produced significantly fewer correct inflections than the younger monolingual children, and the older bilingual children also produced fewer correct inflections than the older monolingual ones.

Also, the older bilingual children's performance was very similar to that of the younger monolinguals. This result suggests that those two groups are in similar stages in the grammatical gender acquisition process, while it takes the bilingual children longer to reach that stage.

7. Discussion

As seen in the previous chapter, Graph 6.1 is the most general one, as it merely looks at the bilingual and monolingual groups as a whole. Even so – or perhaps exactly due to its simplicity –, it is a good starting point for analysis and commentary.

As mentioned in section 6, the cut-off point for the age groups was 3.5 years old, as that is the average age at which monolingual children have fully acquired the grammatical gender system of Brazilian Portuguese. The expected result of ignoring the age group division and grouping all monolinguals together, thus, would be that the average of correct inflections produced by that group would be higher than the one produced solely by monolinguals in Group 1, and lower than the one produced solely by monolinguals in Group 2. That would be the case since the monolinguals group would include both children who most likely have already acquired the grammatical gender system and children who most likely have not, due to their ages.

Since there is no previous research on the average age by which bilingual Brazilian Portuguese-English-speaking children have fully acquired the grammatical gender system of BP, the cut-off point for the age groups was decided based on the available information on monolingual children. As such, at this point, there is still no way to affirm whether the combined bilingual group included children who have acquired the grammatical gender system, children who have not yet acquired it, or both.

Therefore, in a way, Graph 6.1 serves as a preview of the more detailed results which will follow, as it would be very unlikely that the general bilingual and monolingual groups would behave differently from the respective bilingual and monolingual separate age groups.

Assuming the null-hypothesis that there is no difference in the acquisition rate between bilinguals and monolinguals, one would expect each of the bilingual age groups to perform similarly to the corresponding monolingual age group. Therefore, it would also be expected that the bilingual group as a whole performs similarly to the monolingual group as a whole. According to the null-hypothesis, both groups would include children who have already acquired the gender system and those who have not. The expected graph of the means of correct inflections produced

by each lingualism group would then be close to a horizontal line, as the numbers would be similar in both lingualism groups.

However, Graph 6.1 shows that that is not what happened in the experiment. The graph shows a positive trendline due to the notably different means found in the bilingual group (11.8) and the monolingual group (15.9). This result, on its own, is not yet sufficient to disprove the null-hypothesis. It is contrary to what would be expected were the null-hypothesis true – enough to justify further investigation.

7.1 Monolinguals

Since the monolingual children are the model for typical grammatical gender acquisition, further analysis of their results is essential to better understand their acquisition rate and, thus, make the comparison with the bilingual children possible.

As mentioned in chapter 6, young monolingual speakers of Brazilian Portuguese have acquired the grammatical gender system by around 3.5 years of age, after which point barely any inflection mistakes are made – and the very few that occur are generally caused by novel words (Correa, Augusto & Castro, 2010).

Therefore, the expected result for the monolingual age Group 2 (with children over 3.5 years old) would be to perform better than the monolingual age Group 1 (with children under 3.5 years old). Group 1 would still be processing and acquiring the gender system, while Group 2 would be expected to have mostly completed that process.

This is precisely what can be observed in the monolingual children's data. Graph 6.2, depicting both monolingual age groups, shows a steep positive trendline as a strong visual indicator of the average number of correct inflections between the younger group (with 11.9 correct inflections) and the older one (with 17.6 correct inflections).

Two critical pieces of information can be inferred from these numbers. The first is that the difference in correct inflections between the two monolingual age groups is 5.7, which is not only statistically significant as demonstrated in chapter 6, but is nearly a third of the total number of inflections produced by each child.

The second piece of information is that the second age group with children 3.5 years old and older, achieved an average number of correct inflections, which is extremely close to the total

number of inflections. Achieving 17.6 out of 18 correct inflections indicates that most of the children in that age group performed perfectly or close to perfectly.

When looking at the individual dots representing each child in the graph, all but one of the children in that group produced 17 or 18 correct inflections. Moreover, the child represented by the lowest dot in the Group 2 side of the graph, having produced 15 correct inflections, is the youngest child in that group.

Thus, the monolingual children in Group 1 still produced a significant amount of grammatically incorrect gender inflections. In contrast, the ones in Group 2 mostly produced perfect or near-perfect grammatical gender inflection, even though they were faced with nouns they had never encountered before.

7.2 Bilinguals

As mentioned in sections 3.1 and 3.2, there is no information on general rates or age of acquisition of the grammatical gender system by bilingual Brazilian Portuguese speakers. For this reason, the development of the research hypothesis was based on the knowledge produced by studies of bilingual grammatical gender acquisition of other languages (Guillelmon & Grosjeana, 2001; Blom, Polišenská & Weerman, 2008; Blom, Polišenská & Unsworth, 2008; Montanari, 2014).

Therefore, at the moment of data analysis, there was no expected age by which bilingual children would theoretically have acquired the Brazilian Portuguese grammatical gender system. Hence, the choice to divide them into age groups following the same criteria as the monolingual group (under and over 3.5 years of age) was used to compare both groups and verify whether there is a significant difference between the bilingual children and their monolingual counterparts.

Looking exclusively at the results produced by the bilingual children, a few interesting observations can be made. Firstly, in Graph 6.3, the ascending line representing the average of correct inflections of both age groups is visibly less slanted than the one observed in Graph 6.2, which depicted the monolingual children.

In the bilingual children's case, the difference in correct inflections between both age groups is of only 2.6 correct inflections. The older bilingual children produced only 2.6 correct inflections more than their younger counterparts, while the older monolingual children produced 5.7 correct

inflections more than their younger counterparts. Thus, the older bilingual children still performed better than the younger ones, but not by a substantial margin.

The other observation which can be made from Graph 6.3 relates to the dots representing individual children. In Group 1, it is possible to see that all the children produced between 9 and 11 correct inflections, presenting a nearly uniform distribution. In Group 2, however, the distribution was quite irregular. Almost half of the group presented similar results to Group 1, producing between 9 and 11 correct inflections. However, slightly over half of the older bilinguals performed somewhat better, producing between 12 and 16 correct inflections.

While these results still present a statistically significant difference, as demonstrated in section 6, it is interesting to observe the distribution of the individual results. The distribution topic will be further explored in section 7.4.

In addition, none of the bilingual children produced 17 or 18 correct inflections, and only two of them produced 16 correct inflections. This result is an initial indication that the bilingual children have not yet fully completed the process of grammatical gender acquisition by the age defined as the cutting point for this experiment. The comparison between the lingualism groups will be discussed in length in section 7.3.

7.3 Bilinguals versus Monolinguals

After investigating the individual characteristics and results of the two lingualism groups separately, it is now possible to draw comparisons between them. As mentioned in section 7, Graph 6.1 serves as an initial point for this comparison by presenting an overview of both lingualism groups, regardless of age. An initial observation of that graph and the corresponding numerical results, as presented in section 6, indicates a difference in the performances of the two groups.

A more in-depth analysis of said comparison is achievable by taking the age groups into account. It is now possible to compare the bilingual children to their similarly-aged monolingual peers, keeping in mind the usual age of grammatical gender acquisition for monolingual children.

In Group 1, containing the younger children, none of the children would be expected to have fully acquired the grammatical gender system of Brazilian Portuguese yet, since they are below the average acquisition age. Thus, it would be theoretically possible that both the bilingual

and the monolingual groups, at that age, would perform very similarly, still producing many incorrect inflections.

While it is true that both groups produced a noticeable amount of incorrect inflections, the difference between their results turned out to still be statistically significant, as shown in section 6. Whereas the bilinguals in Group 1 produced an average of 9.5 correct inflections, the monolinguals in the same age group produced an average of 11.9 correct inflections, an increase of approximately 15 percent. This indicates that, despite both monolinguals and bilinguals in the younger age group being below the age of grammatical gender acquisition, the monolingual children seem to be more advanced in that process than their bilingual counterparts.

While all the bilingual children in Group 1 produced between 9 and 11 correct inflections, the monolingual children's production had a larger range, with results between 9 and 14 correct inflections.

Perhaps the most interesting question, however, rests on the performance of Group 2, containing the older children. Considering that the monolinguals in that age group would be mostly expected to have already fully or almost fully acquired the grammatical gender system, verifying how the bilingual children's results stack up against those of their monolingual counterparts will provide important information about where they stand in the grammatical gender acquisition process.

As it turns out, the difference between the bilingual and monolingual results in Group 2 is even more glaring than in Group 1, as demonstrated in section 6. The older bilinguals produced an average of 12.1 correct inflections, compared to the 17.6 correct inflections produced by the older monolinguals. Thus, the older bilinguals produced an average of 5.5 less correct inflections than their monolingual peers, a difference which is more than twice the one found between bilinguals and monolinguals in Group 1, and which is represented in Graph 6.5 by the steep diagonal line.

From these results, it is possible to draw some conclusions about how the bilingual children's grammatical gender acquisition process compares to the monolingual acquisition process. For one, that there is a markedly smaller difference between younger and older bilinguals than there is between younger and older monolinguals leads to the conclusion that, in the same amount of time, the monolinguals make more progress in their acquisition process than the bilinguals. Their improvement results in producing 5.7 more correct inflections than their younger counterparts. The difference between the older and younger bilinguals is only 2.6 correct

inflections. Graphically, this difference can be visualized in the much more pronounced steepness of the line representing the monolinguals' progress, versus the much less slanted line representing the bilinguals' in Graph 6.7.

Furthermore, alongside making slower progress, it appears that the grammatical gender acquisition process of the bilingual children also starts later than that of the monolingual children. This can be inferred from the fact that there is a significant difference between bilingual and monolingual children, even in Group 1. The monolingual children most likely have already started processing the grammatical gender differences in inflection, thus producing approximately two-thirds of the inflections correctly. Meanwhile, the bilinguals might be yet to start noticing and producing the difference between masculine and feminine inflections, seeing as they produced approximately half of the inflections correctly, as demonstrated in section 6.

Furthermore, the younger bilinguals mostly produced only masculine inflections. The reasons for the predominance of masculine inflections will be further commented on in section 7.5. However, the lack of production of feminine inflections by the younger bilinguals is a clear indicator that they have not yet reached the stage of noticing and reproducing the difference between masculine and feminine nouns and inflections. As such, they appear to be behind their monolingual counterparts in this process.

A later start would also explain why the results of the older bilinguals were so close to that of the younger monolinguals. The present results lead to the conclusion that the bilinguals in Group 2 might be in a similar stage in the grammatical gender acquisition process as the monolinguals in Group 1.

Since the older bilinguals also achieved approximately two-thirds of the total inflections correctly (virtually all of the masculine inflections and some of the feminine ones), it is likely that they have already begun to notice the difference between feminine and masculine inflections. Therefore, they should replicate that difference in their language production in a somewhat higher frequency than observable by chance. Hence, while not having acquired the Brazilian Portuguese gender system to the point of achieving a perfect or near-perfect performance, the older bilingual children seem to be ahead of their younger peers, demonstrating that they have at least begun the acquisition process. The reasons for the disparity in results between the correct masculine and feminine inflections produced will be analyzed further in section 7.5.

These findings go hand in hand with the current knowledge about early bilingual and heritage language acquisition: grammatical gender inflection is known to be one of the most challenging areas for both young and adult heritage language learners (Polinsky & Kagan, 2007; Silvina, Foote & Perpiñán, 2008; Polinsky, 2018), and one of the main points where cross-language interference can be observed in bilingual language acquisition (Odlin, 1989; Silva-Corvalán, 1994; Seliger, 1996).

In the current study, the participating bilingual children are acquiring Brazilian Portuguese not only in a concomitant bilingual context paired with English, but as a heritage language. Consequently, they experience the cross-language interference of the lack of gender inflection in English, as well as the fact that Brazilian Portuguese is only their home language, with English most likely being used in all other contexts in their lives. Thus, their observed results are consistent with the effects of the limited exposure to Brazilian Portuguese grammatical gender inflection, combined with the inexistence of a similar grammatical feature in English.

7.4 Individual results distribution

After analyzing both lingualism groups separately and comparing them to each other, it is now possible to return to the distribution of the children's individual results. As shown in Graphs 6.2 to 6.6, the dots representing the number of correct inflections produced by each child are not distributed uniformly. Based on the previous discussions about the observed results, however, the reasons for that become evident.

The most uniform distribution is found among the four bilingual children in Group 1: as aforementioned, all of them produced between 9 and 11 correct inflections, out of the possible 18. Since there are only two grammatical genders in Brazilian Portuguese, each random inflection has a 50 percent chance of being correct. As such, the younger bilinguals' result is consistent with what would be achieved by merely producing inflections randomly. That is one possible explanation for their observed result – however, whether that is the case or not will be further explored in section 7.5.

The distribution observed within the older bilingual group can be compared to that of the younger monolingual group: both have a much larger range than the ones seen in either the younger bilinguals or, the older monolinguals. Whereas the older bilinguals produced between 9 and 16

(thus, having a range of 7) correct inflections, the younger monolinguals produced between 9 and 14 (with a range of 5).

As seen in section 7.3, these non-uniform distributions are consistent with groups of children who are still going through the process of acquiring the grammatical gender system. While some of the children in both these groups will still be in the very early stages of the process, producing a lower number of correct inflections, other children within the same groups might be more linguistically advanced, producing a higher amount of correct inflections. However, in both groups, the process does not seem to be fully completed yet, considering that no child in either group produced 17 or 18 correct inflections.

The distribution of the results of the older monolingual children also proves to be quite interesting because it is the only group in which a clear outlier can be observed. Initially, results show that the older monolingual group (Group 2) produced between 15 and 18 correct inflections, thus having a range of 3. However, in Graph 6.2, it is noticeable that only one child produced 15 correct inflections, with the other 15 children in that group producing either 17 or 18 correct inflections each.

As mentioned in section 7.1, the child who produced 15 correct inflections is the youngest in that group, at 3.6 years old. It is also important to remember that the usual age of grammatical gender acquisition is *circa* 3.5 years old. The age of 3.5 years old was, thus, used as the cut-off point to separate the two age groups due to being the average age by which monolingual children have acquired the grammatical gender system in Brazilian Portuguese, as discussed in sections 3.1 and 6. As a consequence of it being an average, however, there will be children who acquire the gender system slightly earlier than 3.5, and some who acquire it slightly later than 3.5 years old. Consequently, the youngest child in Group 2, at 3.6 years old, could easily fit into Group 1 with the younger children.

It would be plausible to conclude that that specific child might still not have fully concluded the grammatical gender acquisition process, thus producing results that are more similar to those of the younger monolinguals in Group 1 instead. [3]

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[3] Of course, at this point, this conclusion is based more on speculation relying on the available information than on an actual certainty. However, as it is not possible to directly question children on where exactly in the acquisition process they are, educated guesses very often have a place in early childhood language acquisition research. For this reason, it is valid to, at the very least, consider this as a possible explanation for that result.

All the other monolingual children in Group 2 produced either 17 or 18 correct inflections (out of 18 words), even when faced with words entirely new for them. Achieving this result in such a consistent manner would only be possible by immediately processing the gender information given by the author when introducing each creature, thus assigning it to one of the two grammatical gender categories, and producing the respective grammatical gender inflection.

This, is the concept of "grammatical gender acquisition," which this research aimed to test. The concentrated distribution of the older monolingual children's results can only be explained by them having mastered grammatical gender in BP. It means that those children understand the gender system in Brazilian Portuguese enough to extract gender information from determiner inflections and produce inflections according to gender information.

7.5 The influence of the masculine default in the gender acquisition process

It is tempting to simply address grammatical gender acquisition as a whole, looking into the total number of correct inflections, and stop at that point. However, doing that would not show all the information that can be extracted from the collected data. When talking about acquiring a given language's gender system, it is also important to consider the particularities of that specific system and investigate whether there is more information to be gained.

In the present study, observing the correct masculine and feminine inflections separately, it became clear that the results for each of them were very different, as presented in section 6. Furthermore, the production of correct masculine inflections was different from the production of all correct inflections, whereas the feminine inflections seemed to mirror the total results.

Without any previous information about the Brazilian Portuguese grammatical gender system, these observations might seem very surprising. However, these results can be directly correlated to several elements of the system, from its distribution to its social and educational consequences.

As mentioned in section 4, the Brazilian Portuguese language, as most Romance languages, is heavily favours masculine nouns. Also, any combination of masculine and feminine nouns will result in a masculine inflection of the accompanying determiners and qualifiers. Hence, young children acquiring Brazilian Portuguese, whether monolingually or in combination with another

language, will have significantly more exposure to masculine nouns and inflections than feminine ones.

The treatment of masculine amplifies the difference in received input between the two grammatical genders as the default grammatical gender: it is taught first, it is considered the norm (whereas feminine is considered a change from the norm), it is the one found in dictionaries, vocabulary lists, etc. While too young to read dictionaries, kindergarten and pre-school-aged children are often exposed to flashcard-style games and activities to teach new words. In those activities, the masculine form is always the one presented first, with the feminine form either following after the masculine form has been learned or being absent altogether at this stage.

Specifically relevant to this research methodology, colours are taught to children first with a masculine inflection. The feminine inflection is either introduced at a later stage or not introduced at all and simply picked up by children through input. For example, a kindergarten activity about colours will teach them the colour red as *vermelho* – m.sg, rather than *vermelha* – f.sg.

Thus, for all purposes, the understanding and production of masculine agreement and inflections seem to lead the acquisition process, with the feminine being subsequently acquired as, for all practical purposes, "non-masculine".

For this reason, it is understandable that the amount of correct masculine inflections produced by the children was higher than the amount of correct feminine inflections in all but one of the groups – the older monolinguals, achieving a perfect or near-perfect result, produced balanced inflections across both gender categories.

It is also important to note that not only were there more correct masculine inflections in general, but the average for the number of correct masculine inflections produced was 8.9 out of 9 possible inflections, i.e. a virtually perfect result. In addition, as mentioned in section 6, no factor significantly affected the rate of correct masculine inflections produced. Both monolinguals and bilinguals, regardless of age, performed similarly for the masculine inflections. It is therefore possible to conclude that all the participating children were already capable of producing masculine inflections.

This fact also explains why the results observed in the feminine inflections followed the exact same trends as the general result. With the amount of correct masculine inflections being similar across the board, the differences between the age groups and between bilinguals and monolinguals were exclusively due to the differences in the production of feminine inflections.

At this point, it is important to return to the considerations explicitly made about the younger bilingual group (Group 1) in section 7.4. Each child in that group produced between 9 and 11correct inflections, which would equate to a roughly 50 percent correct result. Since there are two grammatical genders in Brazilian Portuguese, each inflection has a 50 percent chance of being correct; as such, it would be tempting to assume that an average of 50 percent correct inflections could be a result of mere chance, with children merely using inflections at random and being correct half of the time.

However, when looking at the amount of correct masculine and feminine inflections produced by each child, it becomes clear that that is not the case. In fact, for the children who produced nine correct inflections, all of them were masculine. The children in that group who produced 10 or 11 correct inflections simply produced one or two correct feminine inflection in addition to the nine masculine ones.

Rather than being a peculiarity of this specific group, the fact that the correct masculine inflections were present equally by all of the children while the feminine ones changed, corroborates the conclusion that the masculine inflections are learned first or treated as default. A look at Graphs 6.8 to 6.11 (especially while comparing them with the corresponding Graphs 6.2 to 6.5) shows that all the children who produced exactly nine correct inflections did so by being correct in all masculine inflections and incorrect in all of the feminine ones.

Especially in the case of the bilingual children, it is noteworthy that almost half of the children (nine out of twenty-one) produced either none or only one correct feminine inflection, while in the monolingual group, that result was only seen in the very youngest child. It is, thus, vital to the understanding of the bilingual gender acquisition process to keep in mind that there is a strong tendency by some children to produce only masculine inflections.

As can be seen most clearly in Graph 6.9, the distribution of the individual results among the older bilinguals (Group 2) shows that the production of correct feminine inflections does not necessarily increase with age: some of the oldest children in Group 2 produced none or one correct inflection, whereas some slightly younger children within the same group produced three or more. As such, it can also be concluded that there is a larger variance in correct inflection production within that group, which is most likely the result of external factors such as possible differences in input or linguistic aptitude, seeing as the estimated marginal means of that group were consistent once the differences between subjects were accounted for.

The prevalence of masculine nouns and inflections in Brazilian Portuguese and the treatment given to masculine noun-determiner agreement are the main reasons for the differences in result between the masculine and feminine inflections. Thus, the role (or lack thereof) of each child's sex in their performance is easily understood. Since the aforementioned factors are a feature of the language itself rather than individual experiences, they equally affect boys and girls. Therefore, the grammatical gender acquisition process is not significantly affected by the speaker's sex.

Finally, the correct production of masculine inflections is not an accurate predictor of grammatical gender acquisition in Brazilian Portuguese. That is to say, a child who correctly produces masculine noun-determiner agreement might or might not have completed the gender acquisition process, depending on whether or not they can also produce feminine inflection and agreement. Since masculine inflections are the default, they are not an indicator of having mastered the difference in grammatical genders, but only an indicator of lexical acquisition. In other words, the child has become familiar with that word to the point of using it in speech, but does not necessarily know its grammatical gender.

On the other hand, a child correctly producing feminine noun-determiner agreement strongly indicates that they can also correctly produce masculine inflection and agreement. The production of both masculine and feminine inflection, on its turn, demonstrates that the child has mastered the difference in grammatical gender and how it correlates to the respective inflections, having, thus, fully processed and acquired the Brazilian Portuguese grammatical gender system.

Furthermore, it is interesting to note that this result is similar to thre results in Krenca, Hipfner-Boucher & Chen (2020). As mentioned in section 3.2, there was no significant difference in the production of correct masculine inflections across the groups of children. All three groups (English-speaking learners of French as a second language, learners of French as a third language whose first language marked gender, and learners of French as a third language whose first language did not mark gender) produced mostly correct masculine inflections.

On the other hand, there was a significant difference in the production of feminine inflections, with the group whose first language marked gender performing much better than the other two. Also, as happened in the present study, the gender of the children was not a significant factor. These findings could point to a trend in the grammatical gender acquisition of Romance languages, since French shares the same two-gender system as Portuguese, and many of the circumstantial linguistic factors are the same (i.e. more masculine nouns than feminine nouns in

the language due to most neuter nouns from Latin becoming masculine, masculine as the default gender, masculine agreement used for groups of masculine and feminine nouns, etc.)

8. Conclusion

The results of this study support the hypothesis that bilingual children acquiring BP along with English start their grammatical gender acquisition process later than monolingual BP-acquiring children, and their general rate of acquisition is slower. As a result, the bilingual children in this study have not yet completely mastered the Brazilian Portuguese gender system by the age of 5 years, as is expected from monolingual children.

There are many possible ramifications of the present research. For instance, while the present research established that the bilingual children have not completed the grammatical gender acquisition process by their fifth birthday, this study's chosen age range did not allow for a definitive answer about the average age in which their process will be completed. A future study could replicate the experiment with older bilingual children in order to answer that question.

There exist a different baseline and speed in bilingual grammar acquisition. This does not signal a pathology or learning disability, but a different language acquisition experience. Acknowledging this difference can not only help lower the number of bilingual and multilingual children erroneously diagnosed with speech delays and learning disabilities, but also inspire a different approach to bilingual and multilingual language education.

Knowledge about specific struggles of bilingual/multilingual language acquisition can be utilized to develop specific learning materials targeting those struggles. In addition, it can serve as a guide to parents on how to best work with their children through bilingual/multilingual and heritage language acquisition, possibly even contributing to closing the gap between the monolingual and bilingual rates of acquisition.

Another study could be developed by following similar procedures to the present experiment, but testing for plural morphology and inflection. Both Portuguese and English include plurals, and they are morphologically formed similarly. As such, it would be interesting to investigate whether plural morphology in bilinguals is acquired at the same rate as monolinguals, or whether bilinguals still present later acquisition even with similar features in both languages. Such follow-up could provide more answers concerning the mental processes and the cognitive load of juggling the L1 acquisition of two languages (2L1).

The present study did not test the correlation between biological sex of the alien creatures and grammatical gender in the language of bilingual children. Correa, Augusto, and Castro (2010) tested that correlation with monolingual Brazilian Portuguese children. They concluded that a negative correlation between a creature's biological sex and its name's grammatical gender (i.e. a male creature whose name was a feminine noun and vice versa) was likely to cause the children to produce incorrect inflections. Replicating that experiment with a mixed lingualism group would be an interesting future project to undertake to add more data about bilingual children to the corpus of grammatical gender acquisition research.

In addition, to establish a fair measure for assessing bilingual children acquiring Brazilian Portuguese, other aspects of language development must also be verified, such as the acquisition of vocabulary, syntax, verbal conjugation, and plural morphology, among others. Investigating those factors would display a much broader panorama of the early acquisition of Brazilian Portuguese as a heritage language, contributing not only to the fair evaluation of bilingual children's proficiency in BP, but also to the development of teaching methods and materials geared towards bilingual learners.

Furthermore, Brazilian Portuguese-Canadian English is only one of countless language combinations. It would also be interesting to investigate whether the results are different if the bilingualism involves languages with the same grammatical gender system, such as Portuguese and Spanish, or if it involves languages with different (but existing) gender systems, such as Portuguese and German – among many other possibilities.

There is still much to be explored in the field of early bilingual and multilingual language acquisition, and while it might seem like a daunting task, even small-scale studies can shed light on specific topics, adding to the existing pool of knowledge providing background and information for future research.

In a relatively young field, which becomes progressively more relevant due to globalization, migrations and increasingly multicultural families, it is necessary to acknowledge the role of first language acquisition in bilingual and multilingual children, as well as affirm their rights to appropriate education and to maintaining ties to all parts of their heritage. Their language acquisition processes and educational needs are worthy of investment and interest, and should not merely seen as an exception to a supposed monolingual norm.

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APPENDIX A – List of words used in the experiment

Ending in -*o*	Ending in -*a*	Ending in -*e* or consonant
Dabo	Bida	Mipe
Puco	Depa	Tobe
Mabo	Poca	Bafe
Lampo	Tica	Dalir
Nepo	Miba	Pilim
Rebo	Nita	Talaz

APPENDIX B – Examples of images used in the experiment