

Is grammatical gender considered arbitrary or semantically motivated? Evidence from young adult monolinguals, second language learners and early bilinguals

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Abstract

It is generally assumed that speakers of grammatical gender languages consider grammatical gender arbitrary, but this assumption has never been tested. Research shows that the grammatical gender of nouns can affect perceptions of the masculinity or femininity of the noun's referent in speakers of languages with masculine or feminine noun classes. However, bilingualism facilitates the development of lexical arbitrariness awareness, and could therefore affect awareness of grammatical gender arbitrariness. This study then compared three groups of young adult speakers of a grammatical gender language: monolinguals, early bilinguals, and instructed second language learners. Participants evaluated the gender assignments of 25 nouns of entities (animals, abstract concepts, natural kinds, and artefacts), and answered open and closed questions about grammatical gender. Participants considered grammatical gender as semantically motivated and mostly related gender assignments to perceived masculine and feminine connotations of referents. Knowledge of an additional grammatical gender language was linked to increased awareness of the arbitrariness of first language gender assignments in both early bilinguals and later instructed learners. It is argued that grammatical gender awareness deserves further investigation. Knowing more than one grammatical gender language can increase awareness of grammatical gender arbitrariness. Implications are discussed for language teaching and language reform.

Introduction

In some languages that have a grammatical gender system, such as Italian and Spanish, all nouns belong to one of two classes, traditionally called 'masculine gender' and 'feminine gender'. Regardless of these labels, grammatical gender assignment is mostly unrelated to biological sex. Although there is a semantic core of grammatically feminine nouns that have a biologically female referent, and of grammatically masculine nouns that have a biologically male referent, nouns are generally masculine or feminine due to formal rather than semantic reasons (Corbett, 1991). However, grammatical gender affects perceptions of the masculinity or femininity of entities in both children and adults, in both real-life behaviour and laboratory tests (Boroditsky, Schmidt, & Phillips, 2003). In spite of this evidence, no previous study has investigated whether grammatical gender is considered semantically arbitrary or motivated.

This study then investigated first whether native speakers of a grammatical gender language consider grammatical gender semantically motivated, and second whether knowledge of another language with different grammatical gender assignments is linked to increased awareness of the arbitrariness of the grammatical gender. **Bilingualism increases awareness of the arbitrariness of words in children**

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(Bialystock, 1987), but no research has looked at its effects on grammatical gender awareness. This study tested young adults because most research has looked at effects of bilingualism on language awareness in children and little research has looked at young adults. Finally, if knowledge of another grammatical gender language increases awareness of grammatical gender arbitrariness, are such effects present only in early bilinguals or also in instructed later language learners? The study then used a questionnaire to compare young adults who knew only one grammatical gender language, knew two languages with different gender assignments from early childhood, or started learning a second language with different gender assignments as a school subject around puberty.

The Semantic Arbitrariness of Grammatical Gender

Grammatical gender systems assign nouns to classes, called *genders*. Grammatical gender is reflected in *agreement*, that is to say, changes in the form of constituents that accompany, or refer to, a noun (Corbett, 1991, 2006). For instance, Italians say *il primo mese caldo* or *la prima giornata calda* ('the first hot month/day'), marking article, ordinal number and adjective as masculine or feminine in agreement with the masculine noun *anno* ('year') or the feminine noun *giornata* ('day'). In Italian the same morpheme marks grammatical gender and number, in German the same morpheme marks grammatical gender, number and case (for descriptions of Italian and German grammatical systems, see Berretta, 2005, and Mills, 1986). For instance, the Italian masculine singular adjective 'big' is *grosso* and the feminine is *grossa*; in German the masculine is *größer*, *grossen*, *grosses* or *größerem* (nominative, accusative, genitive, dative), the feminine is *große* (nominative and accusative) or *größer* (genitive and dative). Every time a speaker talks about an entity, they need to mark constituents such as articles, adjectives, ordinal numbers, pronouns and participles to agree with the grammatical gender of the referent's noun.

The grammatical gender of a noun is determined by *gender assignment*, a set of semantic and/or formal rules. Although various types of gender system exist (Corbett, 1991), this study investigated languages whose grammatical gender is partly related to biological sex. In some Indo-European languages such as Italian there are two genders, which are called *masculine* and *feminine* because some nouns belonging to the former category have referents that are biologically male, and some nouns belonging to the latter category have biologically female referents. German also has a *neuter* gender. In these *grammatical gender languages*, assignment is largely formally (phonologically and/or morphologically) motivated, as most nouns are assigned a gender depending on their form, regardless of characteristics of their referent. For instance, the vast majority of Italian nouns that end in /a/ are grammatically feminine. While some nouns refer to male or female humans or sexed entities, constituting a small *semantic core*, most nouns refer to asexed entities such as objects, constituting a much larger *semantic residual*.

Grammatical gender is then largely semantically arbitrary and it only partly overlaps with *semantic gender*. Furthermore, assignment may be semantically motivated but unrelated to biological sex, as classes of lexical items can have the same grammatical gender within a language (e.g., in German all predators are masculine, Zubin & Köpcke, 1986). The relationship between grammatical gender and biological sex is complex because there is a mixture of semantic and formal motivation. For instance, Italian feminine nouns refer to biologically female referents (e.g., *zia*, 'aunt', *mucca*, 'cow'), but also asexed referents (such as artefacts, abstract concepts and natural kinds, e.g. *sedia*, 'chair', including referents with male connotations, e.g. *pistola*,

‘gun’), referents of either sex (epicene nouns, e.g., *volpe*, ‘fox’, used for both male and female foxes), and occasionally male referents (e.g., *sentinella*, ‘[male] sentry’). There is therefore mostly no relationship, and occasionally even a conflict, between the grammatical gender of a lexical item and the properties of its referent.

Assignments are semantically arbitrary both within languages (e.g., there is no semantic reason why in Italian ‘flower’ and ‘toothbrush’ are masculine) and across languages (e.g., ‘flower’ and ‘toothbrush’ are feminine in German).

Effects of Grammatical Gender in Monolingual Speakers

It is generally assumed that speakers of a grammatical gender language consider grammatical gender arbitrary (Sapir, 1921). However, both real-life behaviours and laboratory studies show that such speakers perceive feminine characteristics in referents of grammatically feminine nouns and masculine characteristics in referents of grammatically masculine nouns. Consumers prefer grammatically masculine or feminine brand names to match the gender connotations of the product (Yorkston & De Mello, 2005). Artists often represent entities as males or females in line with the grammatical gender of their noun, even when no ready-made cultural representation are available (Segel & Boroditsky, 2011). Adults make sense a posteriori of the gender assignments of their mother tongue, for instance explaining that the word ‘beard’ is feminine, in spite of its male connotations, because it is soft and pliable (Clarke, Losoff, & Rood, 1982).

Experimental studies found effects of grammatical gender in adult and child speakers of Romance languages, and to a lesser extent of German. The grammatical gender of nouns affects performance in gender attribution tasks such as assigning male or female voices or names to objects and animals (Flaherty, 1999; Mills, 1986; Sera et al., 2002) or rating entities’ similarity to female and male humans (Flaherty, 1999; Martinez & Shatz, 1996), although some studies found no effects of grammatical gender (e.g., Ramos & Roberson, 2010). Effects were also found in tasks that do not involve gender attribution, for instance learning names for objects is more difficult if there is a mismatch between the grammatical genders of the name and of the object’s noun (Boroditsky & Schmidt, 2000). Some studies measured effects of grammatical gender on masculine and feminine connotations of concepts using the semantic differential task (SDT). Grammatically feminine objects (Konishi, 1993) and animals (Bassetti, 2011) are rated lower than masculine ones on scales of potency, and grammatically feminine affect nouns such as ‘courage’ are rated lower than masculine ones in scales of extroversion (Zubin & Köpcke, 1984). However, at least one SDT study found no cross-linguistic differences (Hofstätter, 1963).

Type of entity seems to interact with grammatical gender, as effects are stronger with animals and weaker or sometimes non-existent with artefacts (Forbes, Poulin-Dubois, Rivero, & Sera, 2008; Sera et al., 2002; Vigliocco, Vinson, Paganelli, & Dworzynski, 2005). Animate entities may be more liable to be attributed biological sex or gender connotations. There may also be a universal preference for female voices for natural kinds and male voices for artefacts (Mullen, 1990; Sera, Berge, & del Castillo Pintado, 1994). Furthermore, the feminine gender may be perceived as more semantically motivated than the masculine gender. The consistency between artistic personification and noun’s grammatical gender is higher for grammatically feminine than masculine nouns (Segel and Boroditsky, 2011); artefacts with a grammatically feminine noun are attributed female voices, but voice choices are random for artefacts with masculine nouns (Bassetti, 2007). This may be because in systems with two genders, feminine grammatical gender assignments may be more often semantically motivated than

masculine ones, as fewer nouns are feminine and therefore a larger proportion of feminine nouns may refer to female referents, while many male nouns have neuter referents.

One reason why grammatical gender is perceived as semantically motivated may be language development, as children acquiring a grammatical gender language may use grammatical gender classification as a meaningful basis for classifying entities, because it partially overlaps with biological sex (Vigliocco et al., 2005), and indeed German preschoolers attribute feminine or masculine characteristics to animals depending on the grammatical gender of the animal's noun (Saalbach, Imai, & Schalk, 2012). This tendency may be reinforced by culture, for instance in child tales anthropomorphised animals and objects are represented as male or female in line with the grammatical gender of their nouns (Mills, 1986).

Whatever the reason, there is now much evidence that grammatical gender affects mental representations of entities in native speakers of grammatical gender languages. However, knowing more than one language may reduce such effects.

Effects of Grammatical Gender in Bilinguals

There is anecdotal evidence that bilingual children and adults sometimes prefer the gender assignments of a second language (Hofstätter, 1963; Taeschner, 1983), and that child second language learners evaluate the match between the grammatical gender assignments of a second language and connotations of the referent, for instance rejecting the French masculine for 'ribbon' (Kenyeres, 1938). Indeed, knowing more than one grammatical gender language affects performance in linguistic and non-linguistic tasks. L1 speakers of a grammatical gender language can rely on L2 grammatical gender assignments if asked to assign a masculine or feminine gender to L1 neuter words (Andonova, Gosheva, Schaffai and Janyan, 2007). While monolingual children prefer female voices for artefacts whose noun is grammatically feminine, there is no such preference in bilingual children whose second language assigns opposite gender to the same entity (Bassetti, 2007). Self-reported proficiency in German and Spanish correlates with effects of the two languages' grammatical gender assignments on bilinguals' similarity classification of objects and animals (Phillips & Boroditsky, 2003, although results could be due to participants having different first languages). Using a semantic differential task, Bassetti (2011) found that bilinguals with two grammatical gender languages are less affected by L1 grammatical gender in rating animals on potency scales, compared with monolinguals (see also Lambelet, 2012). Finally, bilingualism may also induce a bias in the perception of masculinity and femininity that is absent in monolingual peers: English-French bilingual children classify objects and animals as 'boys' or 'girls' in line with their French grammatical gender, whereas English monolingual peers do not show this bias (Nicoladis & Foursha-Stevenson, 2012); L2 Spanish grammatical gender affects performance in voice attribution tasks in English-Spanish bilinguals (Forbes et al., 2008), and just ten weeks of instruction in L2 Spanish gender assignment can affect voice attributions in English native speakers (Kurinski and Sera, 2011). Finally, bilingualism modulates effects of grammatical gender on voice attribution tasks both in early (before age 7) and late bilinguals (Forbes et al., 2008).

It appears that grammatical gender affects behaviour both in real life and in laboratory tests, and that grammatical gender effects are weaker in those who know

more than one grammatical gender language. Still, no study has directly investigated whether speakers consider grammatical gender as semantically motivated, in either monolinguals or bilinguals.

Bilingualism and the Arbitrariness of Language

Knowledge of more than one language is linked to an enhanced, or at least precocious, development of some aspects of metalinguistic awareness (see Adesope, Lavin, Thompson, & Ungerleider, 2010 for a recent meta-analysis). In particular, bilingual children develop awareness of the arbitrariness of words earlier than monolinguals (Ben-Zeev, 1977; Bialystok, 1988; Feldman & Shen, 1971; Ricciardelli, 1992), probably because they learn two words for the same referent (Bialystok, 1987). Although awareness correlates with bilingualism (Edwards & Christophersen, 1988), positive effects were found in unbalanced bilinguals (Bialystok, 1987), and in children with minimal amounts of L2 instruction (Yelland, Pollard, & Mercuri, 1993). Since knowledge of more than one language facilitates the development of awareness of the arbitrariness of the relationship between nouns and referents, it may also facilitate the development of awareness of the arbitrariness of grammatical gender.

The Present Study

In spite of all the evidence that speakers of grammatical gender languages often perceive grammatical gender as related to the (perceived) masculinity and femininity of referents, no study has so far investigated whether such speakers think that grammatical gender is arbitrary or semantically motivated. The present study then aimed at testing first whether speakers of a grammatical gender language consider grammatical gender as semantically motivated, and second whether knowledge of more than one language is linked to an increased awareness of the arbitrariness of grammatical gender if the two languages assign opposite gender to the same entities. Participants were native speakers of a grammatical gender language (Italian) who did not know another grammatical gender language ('monolinguals'), who had known a language with different grammatical gender assignments (German) since early childhood ('early bilinguals'), or who had started learning such a language as a school subject around puberty ('second language learners'). Young adults were selected because they are old enough to show effects of grammatical gender in behavioural tasks, and to be able to engage in metalinguistic reflection. Italians were selected because speakers of Romance languages are strongly affected by grammatical gender in behavioural tasks, and because Italian young adults study linguistics (phonology, morphology and syntax) in the three years prior to entering high school, and are therefore used to thinking metalinguistically about language. A questionnaire tested whether participants considered grammatical gender arbitrary, whether they considered the grammatical gender assignments of their first language (L1) as semantically motivated and if so why, and whether the perceived semantic motivation of grammatical gender varied across types of entities. Three predictions were made:

1. Native speakers of a grammatical gender language (Italian) should consider grammatical gender as semantically motivated rather than arbitrary, and consider the assignments of their L1 as appropriate in a grammatical gender assignment evaluation task, in a series of open-ended questions and in a multiple-choice question about grammatical gender arbitrariness.
2. Monolinguals should consider the grammatical gender assignment of their mother tongue more semantically motivated, compared with peers with knowledge of another grammatical gender language with opposite assignments. This is because

bilingualism facilitates the development of awareness of the arbitrariness of language, and reduces the effects of first language grammatical gender on gender attribution tasks and semantic differential tasks. Monolinguals should then maximally differ from early bilinguals. Second language learners, who had started learning the second language around puberty in an instructed environment, should perform in-between the monolingual and early bilingual group. This is because even limited exposure to a second language in an instructed environment can increase metalinguistic awareness (e.g., Bialystok, 1987; Yelland et al., 1993), and grammatical gender effects on semantic differential tasks are stronger in monolingual adults than in those who learnt another grammatical gender language with different assignments (Bassetti, 2011).

3. Grammatical gender appropriateness ratings should vary across different types of entities, and in particular grammatical gender assignments should be considered more semantically motivated for animate than inanimate entities. This is because grammatical gender affects masculinity and femininity preferences much less, or not at all, for artefacts (Mills, 1986; Sera et al., 2002; Vigliocco, Vinson, Paganelli, & Dworzynski, 2005).

Method

Participants

Participants were 60 high-school students: monolinguals, second language (L2) learners and early bilinguals (see Table 1 for participants' characteristics). All participants were Italian native speakers, spoke Italian at home and were living in Italy. The early bilinguals had been attending a German immersion school since age 4 or 5, and one third spoke both German and Italian at home. The L2 learners had been learning German as a school subject for a median of 32 months (range: 8-80). As is normal among young Europeans, all participants had studied English. Knowledge of L2 English does not affect performance in tasks that measure effects of L1 grammatical gender (Boroditsky et al., 2003; Ervin, 1962). Some participants had studied French or Spanish, both grammatical gender languages.

Characteristic	Group		
	Monolinguals	L2 learners	Early bilinguals
<i>N</i>	20	20	20
Gender (% of females)	60%	60%	60%
Mean age [years;months]	15;0	15;6	15;1
Age range [years;months]	13;11-17;8	14;3-17;1	14;1-16;10
Knowledge of French			
% of participants	10%	50%	100%
median [years]	6	4	1
Knowledge of Spanish			
% of participants	10%	10%	5%
median [years]	6	5	4

Table 1
Characteristics of participants by group

Materials and Procedure

Participants were administered a pencil-and-paper questionnaire in their classroom by one of their teachers. The questionnaire was entitled 'The use of grammatical gender in Italian and German' and was written in Italian. Such a questionnaire would not appear unusual to Italian students, who study linguistics between ages 10-13.

Instructions briefly explained that Italian and German have grammatical gender, with two genders in Italian and three in German, and that some assignments are the same and others vary across languages (see the Appendix for an English translation of the questionnaire). There were various tasks:

Grammatical gender assignments evaluation task. Participants rated 25 nouns of entities that have opposite gender in Italian and German on a labelled seven-point scale ranging from 'Italian is very odd' to 'German is very odd', with 'both [languages] are fine' as the medium point. The aim of this task was to ascertain whether entities were considered masculine or feminine, and whether the opposite assignment was considered acceptable. There were four types of entities: eight abstract concepts (work, marriage, forgiveness, love, spring, sin, death, faith), five natural kinds (flower, sun, moon, apple, rain; a sixth defective entity was eliminated from analysis), six artefacts (toothbrush, clock, newspaper, key, ball, armchair) and six animals (snake, spider, toad, tiger, butterfly, frog). Within each type, about half of the entities were masculine in Italian and feminine in German ('Italian-masculine entities'), and about half were feminine in Italian and masculine in German ('Italian-feminine entities'). Each entity appeared on a separate line: the entity's noun was written in Italian and German with an indication of its grammatical gender in each language (article before the noun, letters 'M' or 'F' after it).

Open questions about gender assignments by type of entity. Participants reflected on their rating of entities in the previous task, and explained in an open format whether one or more specific entities appeared odd with the Italian or German assignments, and why. There were four questions, for each of the four types of entities (abstract concepts, natural kinds, artefacts, animals). The aim was to investigate which entities were considered masculine and which ones feminine, and what criteria were applied to evaluate the match between a referent and the grammatical gender of its noun.

German gender assignment oddness rating by type of entity. Participants rated the German assignments of each of the four types of entities on a 7-point scale ranging from 'very odd' to 'absolutely normal'. The aim was establish whether participants considered L1 grammatical gender assignments as more semantically motivated for some types of entities than for others, to confirm results obtained from the rating task with answers to an explicit question.

Open question about the relationship of grammatical gender with grammar and semantics. Participants explained in an open format whether grammatical gender is a matter of grammar or it reflects characteristics of the entities it refers to.

Multiple-choice question about grammatical gender arbitrariness. Participants selected one of the following options: the Italian grammatical gender is more natural (*logico*) than the German one, the German one is more natural, or both assignments are equally natural or unnatural. The Italian *logico* translates in English as 'natural, obvious' (not as 'logically sound'). The purpose was to ask explicitly whether grammatical gender systems are semantically motivated or not, and if they are, whether one of the two systems is more semantically motivated.

Questions about interest in and difficulty of grammatical gender assignments.

Participants rated on a seven-point scale their interest in understanding why words have different gender assignments in the two languages. L2 learners also rated their

difficulty in learning German assignments, and frequency of their gender assignment errors in German. Early bilinguals rated their difficulty in remembering gender assignments and frequency of gender assignment errors in both languages. The questionnaire closed with questions about biographical and linguistic backgrounds, and space for feedback.

Preliminary Analyses

Ratings on the gender appropriateness evaluation task were coded as ranging from -3 = 'Italian is odd' to +3 = 'German is odd', with 0 = 'both [languages] are fine'. The 25 items had high reliability, Cronbach's $\alpha = .74$. Participants' gender and age were not related to mean appropriateness ratings (gender: $t(57) = .08, p = .937$; age: $r = -.14, p = .298$). To ensure that in performing the gender assignments evaluation task participants were evaluating the match between a referent and the grammatical gender of its noun, a preliminary analysis looked at participants' ratings of tiger and snake, animals that are generally rated as masculine (Flaherty, 2001). Participants rated as odd both the Italian feminine gender for the tiger ($M = -0.20, SD = 1.07$) and the German feminine gender for the snake ($M = 0.33, SD = 1.17$), confirming that their ratings reflected semantic considerations.

Results

Quantitative Results

Grammatical gender assignments evaluation task.

For each participant, a mean rating was calculated from their ratings of the 25 entities on 7-point scales.

Effects of group. Across groups, the mean rating was above zero, in the direction of 'Italian is appropriate'. However, the rating was three times higher among monolinguals ($M = 0.58, SD = 0.42$) than among early bilinguals ($M = 0.19, SD = 0.15$), with the L2 learners in-between ($M = 0.26, SD = 0.32$). The three groups' ratings were different, Welch's $F(2, 32.15) = 7.64, p = .002, \omega^2 = .20$. Tamhane's T2 post-hoc tests revealed that monolinguals considered Italian assignments more appropriate than both early bilinguals ($p = .002$) and L2 learners ($p = .033$). There were no differences between early bilinguals and L2 learners ($p = .721$).

Effects of type of entity. The Italian grammatical gender was rated as more appropriate than the German one across types of entities. However, the difference was largest for animals, followed by abstract concepts and natural kinds, and artefacts were rated just above zero, except by monolinguals (Figure 1).

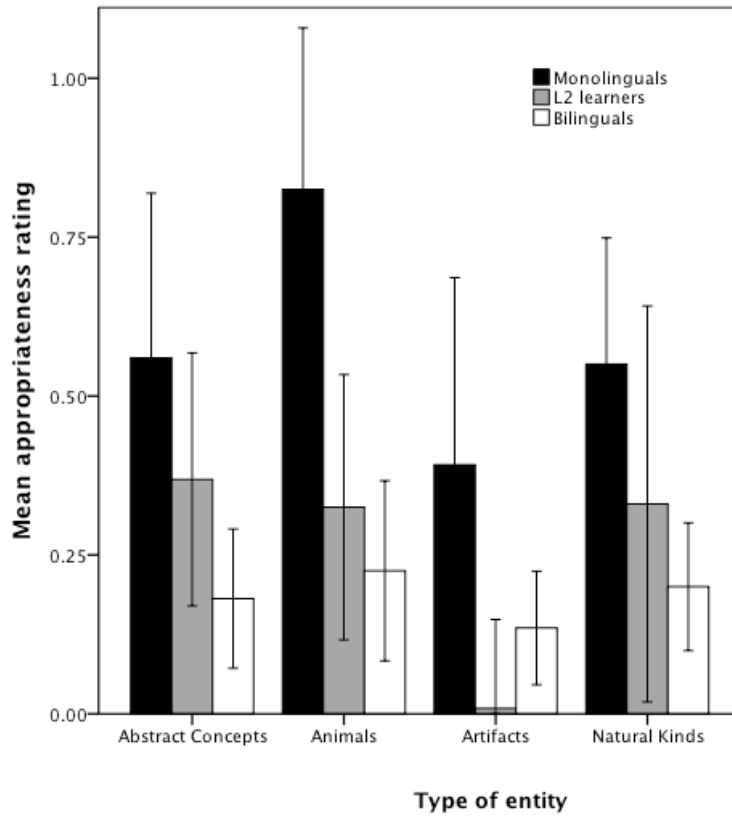


Figure 1
Mean appropriateness rating of Italian grammatical gender assignments, by language background and type of entity (-3 = German is appropriate, +3 = Italian is appropriate). Error bars represent standard errors.

Type of entity	Gender appropriateness <i>M (SD)</i>			ANOVA				Post-hoc tests		
	Monolinguals	L2 learners	Early bilinguals	dfs	<i>F</i>	<i>p</i>	ω^2	Monolinguals- Early bilinguals	Monolinguals- L2 learners	L2 learners- Early bilinguals
Abstract concepts	0.56 (0.58)	0.37 (0.45)	0.18 (0.25)	2, 33.51	4.21	.023*	.08	.037*	.578	.294
Animals	0.83 (0.57)	0.33 (0.47)	0.23 (0.32)	2, 35.75	8.41	.001**	.22	.001**	.013*	.818
Artefacts	0.39 (0.66)	0.01 (0.31)	0.14 (0.20)	2, 33.29	2.97	.065	.09	.293	.077	.357
Natural kinds	0.55 (0.44)	0.33 (0.70)	0.20 (0.23)	2, 32.03	4.91	.014*	.05	.012*	.565	.820

Table 2

Mean ratings (standard deviations in brackets) of the appropriateness of grammatical gender assignment, Welch's ANOVAs and Tamhane's T2 post-hoc comparisons, by group and type of entity

* $p < .05$

** $p < .005$

Welch's ANOVAs (Table 2) revealed group differences in ratings of animals (with a large effect size), and abstract concepts and natural kinds (both with medium effect sizes). Differences among groups in ratings of the grammatical gender of artefacts failed to reach significance. Tamhane's post-hoc tests (Table 2) revealed that the monolingual group rated Italian assignments as more appropriate compared with the early bilingual group for abstract concepts, animals and natural kinds. The L2 learners did not differ from either monolinguals or early bilinguals, apart from rating the German gender assignments for animals as more appropriate than the monolingual group.

The effects of type of entity were not related to word frequency. Word frequencies differed across entity types (abstract concepts: $Med = 31.33$; natural kinds: $Med = 24.27$; artefacts: $Med = 9.21$; animals: $Med = 3.38$, $H = 9.81$, $p = .02$), however the only significant post-hoc test revealed that words for abstract concepts are more frequent than words for animals ($U = 1.00$, $p = .001$; frequencies obtained from the Italian web corpus itWaC, Baroni, Bernardini, Ferraresi, & Zanchetta, 2009).

Ratings of individual items. Five entities had a median above zero across groups, which shows a perceived match between the entity and the Italian grammatical gender assignment for its noun: the Italian-masculine 'work' and 'toad' and the Italian-feminine 'spring', 'moon' and 'butterfly'. However, there were group differences. In the monolingual group almost half of the entities (44%) had a median above zero (work, spring, forgiveness, moon, apple, rain, toothbrush, snake, spider, toad and frog). Among the early bilinguals, only two entities had a median rating above zero ('butterfly' and 'spring'). The L2 learners group performed in between, with one third of medians above zero (work, spring, sun, moon, apple, toad, butterfly) and one median below zero (the Italian-masculine 'flower').

German gender assignment oddness rating by type of entity.

Participants' ratings of the oddness of German assignments for each of the four types of entities confirmed results from the grammatical gender assignments evaluation task. The German grammatical gender was rated as odd across types of entities. Groups differed in ratings of animals ($F(2, 55) = 4.44$, $p = .017$) and abstract concepts ($F(2, 57) = 4.29$, $p = .019$), with post-hoc tests showing a difference between monolinguals and early bilinguals (abstract concept: $p = .015$; animals: $p = .018$). There were no group differences in ratings of natural kinds ($F(2, 56) = 1.16$, $p = .323$) or artefacts ($F < 1$).

Multiple-choice question about grammatical gender arbitrariness.

For the multiple-choice question asking whether the grammatical gender system of the two languages are equally natural/unnatural, or one is more natural, one third of all participants selected 'Italian is more natural'. However, while most of monolinguals (65%) selected Italian, 70% of second language learners and 80% of early bilinguals answered that the two languages' grammatical gender systems are equally natural or unnatural (Figure 2). Only 10% of L2 users and 5% of early bilinguals considered German gender more natural, and no monolingual did. A Fisher's chi-square test revealed an association between language background and the perceived naturalness of Italian grammatical gender, $p = .003$. The odds of Italian speakers considering Italian grammatical gender assignment as more natural were ten times higher if they were monolinguals than early bilinguals, and 7 times higher if they were monolinguals than L2 learners.

Interest in, and difficulty of, grammatical gender. Groups varied in their levels of interest in understanding why words have different gender assignments in the two languages, Welch's $F(2, 36.32) = 5.32$, $p = .009$. Early bilinguals were not interested ($M = 4.00$, $SD = 1.34$), and therefore

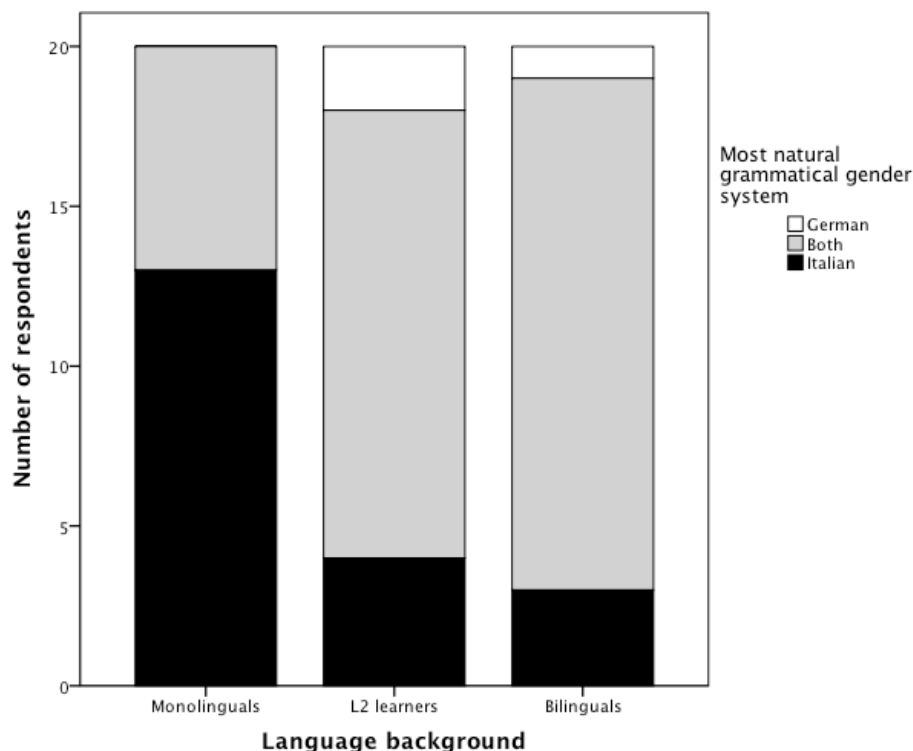


Figure 2
Number of respondents who considered Italian grammatical gender assignment more natural, both languages equally natural/unnatural, or German assignment more natural, by group.

differed from both monolinguals ($M = 5.15$, $SD = 1.50$, $p = .05$) and L2 learners ($M = 5.25$, $SD = 1.07$, $p = .01$), who were equally interested ($p = .993$). L2 learners found it slightly difficult to learn L2 gender assignments ($M = 5.20$, $SD = 0.30$) and reported sometimes making gender assignment errors in German ($M = 4.65$, $SD = 0.18$). Early bilinguals thought that remembering assignments is easy in both Italian ($M = 1.80$, $SD = 1.58$) and German ($M = 3.90$, $SD = 1.68$), however it was easier in Italian, $t(19) = -4.53$, $p < .001$. They also reported making very few assignment errors in Italian ($M = 1.47$, $SD = 0.61$) and few in German ($M = 3.47$, $SD = 1.65$), but again more in German, $t(18) = -5.13$, $p < .001$

Qualitative Results

Participants' answers to open questions confirmed the quantitative findings, and revealed qualitative differences among the groups. Across groups, most participants considered grammatical gender as semantically motivated, and mostly explained grammatical gender assignments in terms of feminine or masculine connotations of referents. However, group differences also emerged. Monolinguals mostly considered grammatical gender as semantically motivated, supported Italian gender assignments, and did not engage in discussing alternative ones. Second language learners accepted German gender assignments much more often than monolinguals, and mostly explained grammatical gender in terms of culture. Early bilinguals were divided between those who believed that grammatical gender is a quirk or language (mostly phonology, occasionally grammar), and those who believed that it is semantically motivated. They were open to accepting assignments from both languages. Finally, across groups gender assignments were considered semantically motivated for animals but not for artefacts.

The semantic motivation of grammatical gender.

When asked directly whether grammatical gender is a grammatical issue or reflects characteristics of the word's referent, almost half of respondents across groups wrote that grammatical gender is semantically motivated (45%; n = 23 out of 51 valid answers). Eight respondents in each group (seven among early bilinguals) wrote that grammatical gender reflects characteristics of its referent: 'I think that words are assigned gender because gender evokes the image of what one said. For instance, the word "summer" expresses an idea of femininity, and I could not imagine it with the masculine gender' (L01, translations by the author). Among L2 learners, the most frequent answer (58%) was that gender reflects culture, such as history, traditions or symbols: 'Each object, animal or entity has a history, which then was used to "create" the article. It surely is not just a matter of grammar, except perhaps some rare cases.' (L16). Only four monolinguals, and none of the early bilingual, gave culture-related answers. Among early bilinguals, 42% explained gender in terms of formal criteria, thinking that it is only a matter of sound and/or grammar or of the speaker's experience with the two languages: 'Gender is a grammatical/phonetic characteristic, concepts themselves have no gender.' (B22). None of the monolinguals and L2 learners mentioned formal criteria.

Motivations for grammatical gender assignments.

In a series of four open questions, participants explained which (if any) of the gender assignments within each type of entity appeared odd and why. Across groups, most participants motivated their choice of grammatical gender assignments based on perceived masculine or feminine connotations of the referent. Feminine gender preferences were explained in relation to beauty, grace, elegance and delicacy (e.g., butterfly, flower), or other perceived female characteristics, such as warmth (armchair), colourfulness (butterfly) or smallness (armchair versus sofa):

I think the butterfly is feminine because ... it is colourful, mobile, small and gracious, it really suits the female grammatical gender. (L18)

I think that the word 'armchair' is very odd in German, because I always thought that the armchair is something that welcomes you, where you can take refuge. I would associate a female and maternal figure to the figure of the armchair. (L24)

The masculine gender was preferred for entities that were considered strong (e.g., sun) or aggressive (tiger), big (toad versus frog) or ugly (spider):

Snake, spider and toad are more related to the masculine because they are aesthetically ugly and aggressive. (L14)

If I think about sun and moon, I imagine a man and a woman; sun and light make me think of strength, while night and the pale moonlight make me think of delicacy, silence and balance, so

I think that the Italian gender assignments are more appropriate. (L15)

A few (7%) referred to masculine or feminine activities, for instance considering 'work' or 'ball' masculine because men work and play ball games.

After connotations, the second most common motivation for grammatical gender preferences was culture. This included mythology (the apple as symbol of female temptation), iconography (spring as a woman) and children tales (the toad as a prince):

Apple is fine with the feminine gender because I imagine it as the fruit of passion. (L14)

The toad: I think it should be masculine, also because it reminds me of the fairy tale of the toad that becomes a prince. (M10)

For instance, the frog was considered feminine because it is delicate, colourful, or smaller than the toad, or because the toad is ugly or because in Italian child tales it becomes a prince (in Germany it is the frog). Three participants believed that frog and toad are female and male specimens of the same species.

Finally, 10% of participants relied on semantic analogy. They relied on the Italian grammatical gender of other words in the same semantic fields, for instance considering 'newspaper' feminine

because it is made of ‘paper’ or because it contains ‘news’, both of which are feminine words in Italian.

Differences between types of entities

Overall, participants rejected German grammatical gender assignments for animals. Among the 44 who commented on animals, 64% rejected the German masculine gender for butterfly, and 68% the German masculine gender for ‘frog’ or the feminine for ‘toad’ or both. The only German gender assignment for animals to be widely accepted (23%) was the masculine for ‘tiger’, because of its strength, potency or aggressiveness, although half as many (11%) preferred the Italian feminine gender assignment because the tiger is fascinating or moves in a feminine way. There were group differences in gender preferences for spider and snake. Monolinguals rejected the German feminine gender for both (47% and 27%), because these animals are ugly, disgusting, or aggressive. L2 learners were almost equally divided on the gender of spider and snake (the spider can be feminine because it weaves, the snake because it is seductive). Among early bilinguals, very few rejected these German gender assignments ($n = 4$ for spider and 3 for snake), but this was due to purely linguistic reasons (sound or own language experience) rather than semantic reasons.

German assignments for abstract concepts were also rejected. Across groups, 43% of the 44 respondents rejected the German masculine gender for the spring season, because of its links with birth and rebirth, flowers, colours, or because of iconography or mythology. Respondents also rejected the German feminine for ‘work’ (27%) and the masculine for ‘faith’ (23%). Unlike animals, a few German gender assignments for concepts were considered appropriate: 20% of respondents preferred the feminine for love (three thirds of whom were L2 learners), and 23% preferred the masculine for death because of its relation with darkness and violence.

While animals and abstract concepts received many comments (two thirds of participants each), only one third of participants commented on natural kinds, and almost exclusively on sun, moon or apple. Across groups, the majority preferred the Italian assignments: feminine for moon and apple (both 91%), and masculine for sun, because of its associations with strength, energy and fire (78%, although another 9% considered it feminine because it is warm and it gives life). There was only one group difference: more than one third of L2 learners preferred the German feminine gender for flower because of its beauty, delicacy or scent.

With regards to artefacts, one third of participants considered grammatical gender assignments as arbitrary (35%), a much higher percentage compared with abstract concepts (18%), animals (17%) and natural kinds (13%). There was also no clear pattern in responses, with the exception of armchair, which 25% of respondents considered feminine, because it is welcoming, or smaller than the (Italian-masculine) sofa.

Summary of findings

Quantitative and qualitative results confirmed the predictions.

1. Native speakers of a grammatical gender language consider grammatical gender semantically motivated;
2. They generally believe that first language grammatical gender assignments for entities are appropriate in terms of perceived masculine or feminine connotations of referents or other factors such as culture;
3. Those who know another language with different grammatical gender assignments perceive L1 grammatical gender as more arbitrary than monolinguals;
4. The effects of knowing two languages are not limited to early bilinguals, but also appear in L2 learners who started learning such a language as a school subject later in life;
5. Grammatical gender is considered more semantically motivated for animals than for artefacts. However, qualitative analyses also revealed an unexpected perceived semantic motivation for abstract concepts and natural kinds.

Discussion

Grammatical Gender is Considered Semantically Motivated

Contrary to common assumptions (e.g., Sapir, 1921), native speakers of a grammatical gender language state that grammatical gender is semantically motivated, and they mostly justify grammatical gender assignments of animals and asexual referents (artefacts, abstract concepts and natural kinds) with reference to gender connotations of the referent. These results are in line with, and contribute to explaining, previous findings that L1 grammatical gender affects performance in gender attribution tasks such as attributing male or female voices or names (Boroditsky and Schmidt, 2000; Flaherty, 1999; Sera et al., 2002) and semantic differential tasks (Bassetti, 2011; Konishi, 1993; Lambelet, 2012; Zubin & Köpcke, 1984).

The present discussion assumes that grammatical gender is semantically arbitrary. However, it should be noticed that this view is not uncontroversial. Early in the 19th century, scholars argued that gender assignments in Indo-European languages reflect gender-related characteristics of the referent (see Corbett, 1991). More recently, researchers found similarities in performance on gender attribution tasks between Spanish speakers and speakers of (gender-less) English, and argued that assignments in Romance languages may reflect universal perceptions of entities as masculine or feminine (Forbes et al., 2008; Sera et al., 1994). The present study investigated speakers' views, and therefore results cannot contribute to the debate on the semantic motivation of grammatical gender, however it is worth bearing in mind that the semantic arbitrariness of grammatical gender is not an established fact.

Grammatical gender is motivated in terms of connotations and cultural representations

In justifying the masculinity or femininity of nouns, participants mostly spontaneously referred to perceived masculine and feminine connotations of entities. This is in line with previous anecdotal evidence that adults find a posteriori semantic motivations for L1 grammatical gender assignments (e.g., Clarke, Losoff, & Rood, 1982), and with evidence that children attribute feminine characteristics to animals with grammatically feminine nouns and masculine ones to grammatically masculine animals (e.g. Chini, 1995; Saalbach et al., 2012). The most frequently mentioned dimension was beauty (beautiful = female, ugly = male), or related dimensions such as elegance, grace and delicacy. The second most common set of connotations related to strength or aggressiveness (strong = masculine) as well as goodness (good = female); other dimensions included size (small = female), warmth (sometimes masculine sometimes feminine) and colour and scent (both feminine). It appears that, in the absence of instructions on how to answer these questions, participants spontaneously related grammatical gender to gender connotations, and in particular to dimensions similar to those used to measure masculinity and femininity in semantic differential task (SDT) studies. Various SDT studies of grammatical gender have used beauty (Bassetti, 2012; Ervin, 1962; Konishi, 1993; Mills, 1986; Zubin & Köpcke, 1984), and strength/aggressiveness (Bassetti, 2012; Ervin, 1962; Konishi, 1993; Mills, 1986; Zubin & Köpcke, 1984), as well as goodness (Bassetti, 2012; Ervin, 1962; Konishi, 1993) and softness (Bassetti, 2012; Mills, 1986; Zubin & Köpcke, 1984). However, the present study's results differed from results from SDT studies. In SDT studies, grammatical gender mostly affected ratings on scales of potency (Bassetti, 2011; Konishi, 1993; Lambelet, 2012), while participants in this study referred more often to beauty or other measures of evaluation, than to strength or other measures of potency. Participants' preferred connotations then were similar to the scales used in SDT studies, but not to SDT studies results.

After connotations, the second most frequent motivation for grammatical gender assignments was cultural references. These included traditions, myths, artistic representations, child tales, and even publicity, as in references to the use of female names for brands of apples. These findings are in line with previous evidence of a relationship between grammatical gender and artistic personifications

(Segel & Boroditsky, 2011). Future research should then take culture into account, especially when making claims about linguistic factors that could in fact be cultural. For instance, both participants in this study and English speakers in a previous study (Flaherty, 2001) rated the snake as masculine, however Japanese speakers rated it as neuter (Saalbach et al., 2012), possibly revealing a common European cultural representation of snake. Future research could investigate this possibility by proposing the same questionnaire to respondents from other cultures. However, culture is only a small part of the explanation, as grammatical gender affected perceived connotations of entities for which there is no artistic personification such as armchairs (in line with Segel & Boroditsky, 2011). Another issue is that culture and language may be difficult to disentangle, as the two often coincide. This study addressed this issue by comparing young adults raised and living in the same cultural environment, who only differed in level of knowledge of a rival grammatical gender language. The differences found among the three groups can then be attributed to linguistic rather than cultural factors. Indeed, studying immersion school students and second language learners is a useful approach for disentangling effects of language and culture on cognition (Bassetti 2007, 2012).

Semantic motivation is stronger for animate and personifiable entities.

Italian gender assignments were considered far more semantically motivated for animals, followed by abstract concepts and natural kinds, whereas gender assignments of artefacts were mostly considered arbitrary. In the grammatical gender evaluation task monolinguals rated Italian grammatical gender as more appropriate for animals, but not for artefacts, and the ratings of monolinguals and non-monolinguals differed for animals but not for artefacts. In open-ended questions, animals elicited far more comments than artefacts, German assignments for animals were mostly rejected, and participants often thought that gender is arbitrary for artefacts.

The difference between animals and artefacts is in line with some previous findings that grammatical gender affects performance in behavioural tasks with animal targets but has weaker or no effects with artefacts (Forbes et al., 2008; Sera et al., 2002; Vigliocco, Vinson, Paganelli, & Dworzynski, 2005). However, grammatical gender also affected perceptions of abstract concepts and natural kinds, often but not exclusively those that are personified in the arts and literature such as sun, moon and spring. Finally, there was no support for previous findings of a universal preference for femininity for natural entities and masculinity for artefacts (Mullen, 1990; Sera et al., 1994). It is possible that grammatical gender overrides this preference.

Results support the view that native speakers of grammatical gender languages follow the classification of grammatical gender in making sense of the world (Boroditsky et al., 2003; Vigliocco et al., 2005). This would explain why as many as one participant out of twenty believed that the frog was the female of the toad. It would also explain why the German grammatical gender was rejected to such extent with animal referents. If children rely on grammatical gender to classify entities as males or females, this is most likely to happen with living entities, which can have a biological sex, than with inanimate ones. However, one should not forget that there are also effects of cultural representations, and that these mostly coincide with grammatical gender. Cultural representations may strengthen the association between grammatical gender and masculinity or femininity in the mind of children, for instance representing the prince as a toad in Italian traditions and as a frog in German traditions.

Knowledge of Another Grammatical Gender Language Increases Awareness of Grammatical Gender's Arbitrariness

As predicted, knowledge of more than one grammatical gender language resulted in increased awareness of grammatical gender arbitrariness and lower levels of perceived semantic motivation for native language gender assignments. Monolinguals were more likely to state that Italian grammatical gender is more natural than the German one, and to reject German grammatical gender assignments. Early bilinguals, having been exposed from early childhood to two languages that

assign opposite gender to the same entity, overwhelmingly considered the two grammatical gender systems as equally natural, and their mean ratings in the assignment evaluation task were one third of the size of Italian monolinguals', with median ratings for most entities being zero. Second language learners, who had been studying German for a relatively short time after puberty in an instructed environment, also differed from monolinguals.

Evidence that knowledge of more than one grammatical gender language increases awareness of grammatical gender arbitrariness is in line with previous findings that bilingualism increases awareness of the arbitrariness of language. Just like knowing two words in two languages for the same referent reveals the arbitrariness of the word-referent relationship (Bialystok, 1987), so knowing two gender assignments for the same referent may reveal the arbitrariness of the grammatical gender-referent relationship.

Evidence of weaker effects of grammatical gender on the evaluation task is in line with previous findings that bilingualism mitigates grammatical gender effects on behavioural tasks such as voice and name assignment (Bassetti, 2007; Forbes et al., 2008; Kurinski & Sera, 2011; Nicoladis & Foursha-Stevenson, 2012) and in semantic differential tasks (Bassetti, 2011; Lambelet, 2012). Non-monolinguals consider the grammatical gender assignments of their L1 as less appropriate, compared with monolingual peers. However, all groups mostly considered Italian grammatical gender assignments more appropriate than German ones, so the difference appears to be not so much in the direction of ratings but in their intensity, confirming previous findings from SDT studies (Bassetti, 2011; Lambelet, 2012).

However, this increased awareness appears to be a consequence of knowledge of specific languages, rather than a consequence of bilingualism per se. The monolinguals group in this study had been studying L2 English for up to ten years, but they were still more affected by L1 grammatical gender than the L2 learners group, many of whom had been studying German for just eight months. This confirms findings that knowing a genderless L2 does not reduce L1 grammatical gender effects (Boroditsky et al., 2003; Ervin, 1962). Since bilingualism per se does not modulate the effects of grammatical gender, it is possible that only knowledge of more than one assignment for the same entity may help people realise that the gender assignments of their first language are arbitrary. As an anonymous reviewer pointed out, however, an alternative explanation is that knowing a different gender assignment may weaken the association between grammatical gender and noun in the L1 (see Arnon & Ramscar, 2012). If this is the case, then bilinguals should differ from monolinguals only on items that have opposite gender in the two languages. Future research could compare monolinguals and bilinguals with two grammatical gender languages performing the tasks used in this study with items that have the same gender in both languages, to see whether knowledge of more than one gender language reveals the arbitrariness of grammatical gender in general, or only affects those entities that have opposite assignments in the two languages.

Differences among groups were revealing. Second language learners were more open to discussing which of the two assignments works best, compared with monolinguals. This is in line with anecdotal evidence that child L2 learners discuss the appropriateness of gender assignments in their languages, or choose the one they prefer (Kenyeres, 1938; Taeschner, 1983). L2 learners also often explained their choices in terms of cultural differences, whereas the other two groups did not. This is in line with previous findings that L2 learners refer to cultural factors but monolinguals do not (Kurinski and Sera, 2011). Monolinguals may have been less aware of differences in representations across cultures, or of the effects of culture on their concepts of entities. As Corbett puts it, 'the personification may seem fully natural to the native speaker, who is not aware of the grammatical gender' (Corbett, 1991, p. 93). It is possible that those who only encounter one grammatical gender system see something natural in it, those who encounter two grammatical gender systems at an early age realise straight away that grammatical gender is a matter of language or of their own language experience, and those who learn a second language at a later age may try to make sense of its grammatical gender system in a more explicit way.

It should be noted that differences among groups could also be due to other factors, for instance issues of identity and attitudes. Monolinguals' rejection of German grammatical gender may reflect positive attitudes towards their mother tongue, while L2 learners who accepted German grammatical gender might have been performing their identity as educated multilinguals. However, monolinguals reported being as interested as L2 learners in understanding why gender assignments differ in the two languages. Issues of attitudes and identity should be further investigated.

A crucial finding was that knowledge of more than one language affects both bilinguals from birth and those who learnt an L2 around puberty. Although grammatical gender effects on behavioural tasks are established by age eight (Flaherty, 2001; Sera et al., 2002), learning an L2 after that age can still modulate perceptions of the semantic motivation of L1 grammatical gender.

Limitations of the Study

This study compared three entire classrooms from three different schools, which may have differed beyond levels of knowledge of German. Due to differences in the schools' catchment areas, socio-economic status may have been lower among the monolinguals. However, group differences in intellectual abilities are unlikely, as both monolinguals and L2 learners were enrolled in a classical high-school, which is considered the most intellectually demanding high-school, with compulsory subjects including five years of Latin, Classical Greek, history and mathematics, as well as three years of philosophy and science among others. The German immersion school follows a similar curriculum.

L2 learners may not be representative of average instructed L2 learners, as they had voluntarily enrolled in a course of study that included German on top of the national curriculum. The L2 learners may have been influenced by explanations of grammatical gender provided by their teachers or textbooks. Half of the L2 learners and all the early bilinguals knew at least some L2 French, and although gender assignments in Romance languages are mostly similar (Foundalis, 2002), one quarter of the target entities had opposite gender in French and Italian. Finally, the study investigated young adults because they were old enough and had sufficient knowledge of linguistics to perform what are fundamentally metalinguistic awareness tasks, however future research should investigate other age groups, as well as individual differences such as intelligence.

Conclusion and Implications

This was to the author's best knowledge the first study to investigate perceptions of the arbitrariness of grammatical gender in native speakers of a grammatical gender language.

The first conclusion is then that *awareness of grammatical gender arbitrariness* is a useful concept, which deserves further investigation. Furthermore, while research on the effects of bilingualism on awareness of the arbitrariness of language has looked at word awareness in children, grammatical gender awareness can be affected by languages learnt later in life. Research on this topic can therefore investigate effects of knowing more than one language on language awareness beyond childhood.

The second conclusion is that knowing two languages with different grammatical gender assignments may increase awareness of the arbitrariness of language, thus reducing language-induced biases in mental representations of the world. Although other explanations are possible, these results may support the views of Benjamin Lee Whorf, arguably the father of linguistic relativity, who believed that the solution to biases in our worldview created by our language was to learn more than one language (Whorf, [1941] 1956).

These results can be relevant to language teachers and learners, showing that language learning can act as a mind-opener even when an additional language is learnt later in life and in an instructed environment. Such findings will also be of interest to language reform supporters who aim at changing people's perceptions of women by changing language, especially at a time when Spanish

academics and public are discussing eliminating grammatical gender in order to facilitate gender equality (Bosque, 2012).

References

- Adesope, O. O., Lavin, T., Thompson, T., & Ungerleider, C. (2010). A systematic review and meta-analysis of the cognitive correlates of bilingualism. *Review of Educational Research*, 80, 207-245. doi: 10.3102/0034654310368803
- Andonova, E., Gosheva, A., Schaffai, J. S., & Janyan, A. (2007). Second language gender system affects first language gender classification. In I. Kecskes & L. Albertazzi (Eds.), *Cognitive aspects of bilingualism* (pp. 271-300). London: Springer. doi: 10.1007/978-1-4020-5935-3_9
- Arnon, X., & Ramscar, X. (2012) Granularity and the acquisition of grammatical gender: How order-of-acquisition affects what gets learned. *Cognition*, 122, 292-305. doi: 10.1016/j.cognition.2011.10.009
- Baroni, M., Bernardini, S., Ferraresi, A., & Zanchetta, E. (2009). The WaCky Wide Web: A collection of very large linguistically processed web-crawled corpora. *Language Resources and Evaluation Journal*, 43(2), 209-226. doi: 10.1007/s10579-009-9081-4 Retrieved from: <http://corpus.leeds.ac.uk>
- Bassetti, B. (2007). Bilingualism and thought: Grammatical gender and concepts of objects in Italian-German bilingual children. *International Journal of Bilingualism*, 11, 251-273. doi: 10.1177/13670069070110030101
- Bassetti, B. (2011). The grammatical and conceptual gender of animals in second language users. In V. J. Cook & B. Bassetti (Eds.), *Language and bilingual cognition* (pp. 357-384). Oxford: Psychology Press.
- Ben-Zeev, S. (1977). The influence of bilingualism on cognitive strategy and cognitive development. *Child Development*, 48, 1009-1018.
- Berretta, M. (2005). Morfologia. In A. A. Sobrero (Ed.), *Introduzione all'italiano contemporaneo. Le strutture* (pp. 193-245). Roma: Laterza.
- Bialystok, E. (1987). Words as things: Development of word concept by bilingual children. *Studies in Second Language Acquisition*, 9, 133-140. doi: 10.1017/S0272263100000437
- Bialystok, E. (1988). Levels of bilingualism and levels of linguistic awareness. *Child Development*, 57, 498-510.
- Boroditsky, L., & Schmidt, L. A. (2000). Sex, syntax, and semantics. In L. R. Gleitman & A. K. Joshi (Eds.), *Proceedings of the Twenty-Second Conference of the Cognitive Science Society* (pp. 42-47). Mahwah, NJ: Lawrence Erlbaum Associates.
- Boroditsky, L., Schmidt, L. A., & Phillips, W. (2003). Sex, syntax and semantics. In D. Gentner & S. Goldin-Meadow (Eds.), *Language in mind: Advances in the study of language and thought* (pp. 61-78). Cambridge, MA: The MIT Press.
- Bosque, I. (2012). Sexismo lingüístico y visibilidad de la mujer, *El País*. Retrieved from http://cultura.elpais.com/cultura/2012/03/02/actualidad/1330717685_771121.html
- Chini, M. (1995). *Genere grammaticale e acquisizione. Aspetti della morfologia nominale in italiano L2*. Milano: Franco Angeli.
- Clarke, M. A., Losoff, A., & Rood, D. S. (1982). Untangling referent and reference in linguistic relativity studies: A response from Clarke et al. *Language Learning*, 32, 209-217. doi: 10.1111/j.1467-1770.1982.tb00529.x
- Corbett, G. G. (1991). *Gender*. Cambridge, UK: Cambridge University Press.
- Corbett, G. G. (2006). Grammatical gender. In K. Brown (Ed.), *The encyclopaedia of language and linguistics* (Second ed., pp. 749-756). Oxford: Elsevier.

- Edwards, D., & Christophersen, H. (1988). Bilingualism, literacy and meta-linguistic awareness in preschool children. *British Journal of Developmental Psychology*, 6, 235-244. doi: 10.1111/j.2044-835X.1988.tb01097.x
- Ervin, S. M. (1962). The connotations of gender. *Word*, 18, 249-261.
- Feldman, C., & Shen, M. (1971). Some language-related cognitive advantages of bilingual five-year-olds. *Journal of Genetic Psychology*, 118, 235-244.
- Flaherty, M. (1999). The influence of a language gender system on perception. *Tohoku Psychologica Folia*, 58, 1-10.
- Flaherty, M. (2001). How a language gender system creeps into perception. *Journal of Cross-Cultural Psychology*, 32(1), 18-31. doi: 10.1177/0022022101032001005
- Forbes, J. N., Poulin-Dubois, D., Rivero, M. R., & Sera, M. D. (2008). Grammatical gender affects bilinguals' conceptual gender: Implications for linguistic relativity and decision making. *The Open Applied Linguistics Journal*, 1, 68-76.
- Foundalis, H. (2002). Evolution of gender in Indo-European languages. In W. D. Gray & C. D. Schunn (Eds.), *Proceedings of the twenty-fourth annual meeting of the Cognitive Science Society* (pp. 304-309). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hofstätter, P. R. (1963). Über sprachliche Bestimmungsleistungen: Das Problem des grammatikalischen Geschlechts von Sonne und Mond [How a seven-year-old Hungarian girl learns French]. *Zeitschrift für experimentelle und angewandte Psychologie*, 10, 91-108.
- Kenyeres, A. (1938). Comment une petite Hongroise de sept ans apprend le Français. *Archives de Psychologie*, 26(104), 321-366.
- Konishi, T. (1993). The semantics of grammatical gender: A cross-cultural study. *Journal of Psycholinguistic Research*, 22, 519-534. doi: 10.1007/BF01068252
- Kurinski, E., & Sera, M. (2011). Does learning Spanish grammatical gender change English-speaking adults' categorization of inanimate objects? *Bilingualism: Language and Cognition*, 14(2), 203-220. doi: 10.1017/S1366728910000179
- Lambelet, A. (2012). *L'apprentissage du genre grammatical en langue étrangère: A la croisée des approches linguistiques et cognitives*. Fribourg, Switzerland: Université de Fribourg.
- Martinez, I., & Shatz, M. (1996). Linguistic influences on categorization in preschool children: a crosslinguistic study. *Journal of Child Language*, 23, 529-545. doi: 10.1017/S030500090000893X
- Mills, A. E. (1986). *The acquisition of gender: A study of English and German*. Berlin: Springer-Verlag.
- Mullen, M. K. (1990). Children's classification of nature and artifact pictures into female and male categories. *Sex Roles*, 23, 577-587. doi: 10.1007/BF00289769
- Nicoladis, E., & Foursha-Stevenson, C. (2012). Language and culture effects on gender classification of objects. *Journal of Cross-Cultural Psychology*, 43(7), 1095-1109. doi: 10.1177/0022022111420144
- Phillips, W., & Boroditsky, L. (2003). Can quirks of grammar affect the way you think? Grammatical gender and object concepts. In R. Alterman & D. Kirsh (Eds.), *Proceedings of the twenty-fifth annual meeting of the Cognitive Science Society* (pp. 928-933). Boston: Cognitive Science Society.
- Ramos, S., & Roberson, D. (2010). What constrains grammatical gender effects on semantic judgements? Evidence from Portuguese. *Journal of Cognitive Psychology*, 23(1), 102-117. doi: 10.1080/20445911.2011.466795
- Ricciardelli, L. A. (1992). Bilingualism and cognitive development in relation to threshold theory. *Journal of Psycholinguistic Research*, 21(4), 301-316. doi: 10.1007/BF01067515
- Saalbach, H., Imai, M., & Schalk, L. (2012). Grammatical gender and inferences about biological properties in German-speaking children. *Cognitive Science*, 36, 1251-1267. doi: 10.1111/j.1551-6709.2012.01251.x

- Sapir, E. (1921). *Language: An introduction to the study of speech*. New York: Harcourt Brace Jovanovich. Retrieved from <http://www.bartleby.com/186/5.html>
- Segel, E., & Boroditsky, L. (2011). Grammar in art. *Frontiers in Psychology*, 1(1), 244. doi: 10.3389/fpsyg.2010.00244
- Sera, M., Elieff, C., Forbes, J. N., Burch, M. C., Rodríguez, W., & Dubois, D. P. (2002). When language affects cognition and when it does not: An analysis of grammatical gender and classification. *Journal of Experimental Psychology: General*, 131(3), 377-397. doi: 10.1037/0096-3445.131.3.377
- Sera, M. D., Berge, C. A. H., & del Castillo Pintado, J. (1994). Grammatical and conceptual forces in the attribution of gender by English and Spanish speakers. *Cognitive Development*, 9(3), 261-292. doi: 10.1016/0885-2014(94)90007-8
- Taeschner, T. (1983). *The sun is feminine. A study of language acquisition in bilingual children*. Berlin: Springer.
- Vigliocco, G., Vinson, D., Paganelli, F., & Dworzynski, K. (2005). Grammatical effects of gender on cognition: Implications for language learning and language use. *Journal of Experimental Psychology*, 134, 501-520. doi: 10.1037/0096-3445.134.4.501
- Whorf, B. L. ([1941] 1956). Languages and logic. In J. B. Carroll (Ed.), *Language, thought and reality: Selected writings of Benjamin Lee Whorf* (pp. 233-245). Cambridge, Massachusetts: The MIT Press.
- Yelland, G. W., Pollard, J., & Mercuri, A. (1993). The metalinguistic benefits of limited contact with a second language. *Applied Psycholinguistics*, 14, 423-444. doi: 10.1017/S0142716400010687
- Yorkston, E., & De Mello, G. E. (2005). Linguistic gender marking and categorization. *Journal of Consumer Research*, 32, 224-234. doi: 10.1086/432232
- Zubin, D. A., & Köpcke, K. M. (1984). Affect classification in the German gender system. *Lingua*, 63, 41-96.
- Zubin, D. A., & Köpcke, K. M. (1986). Gender and folk taxonomy: The indexical relation between grammatical and lexical categorization. In C. G. Craig (Ed.), *Noun classes and categorization: Proceedings of a symposium on categorization and noun classification* (pp. 139-180). Amsterdam: Benjamins.

Appendix. English Translation of the Questionnaire

GRAMMATICAL GENDER IN ITALIAN AND GERMAN

The Italian and German languages both assign a grammatical gender to all nouns. German nouns can be masculine, feminine or neuter, Italian nouns can be masculine or feminine. Many nouns take the same gender in both languages; for instance, ‘mother’, ‘science’ and ‘duck’ are feminine in both languages, whereas ‘father’, ‘instinct’ and ‘parrot’ are masculine. But gender assignment often diverges, so that the same noun has a different gender in German and in Italian. For instance, ‘dance’ is masculine in German (‘der Tanz’) and feminine in Italian (‘la danza’).

The table on the next page lists some nouns that have opposite gender in the two languages. Please read each word carefully, and decide what you think about it: is it more appropriate for it to be masculine or feminine, or does it make no difference? Does one of the two languages assign gender more appropriately to this word, or are both fine? Circle the answer you prefer. For instance, if you think that dance is neither particularly masculine nor feminine, you will answer like this:

der Tanz (M)	la danza (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
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If you think that the appropriate gender for dance is feminine, and that using masculine as in German is slightly odd, you can answer like this:

der Tanz (M)	la danza (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
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If you think that using the feminine gender for dance, as in Italian, is very odd, you can answer like this:

der Tanz (M)	la danza (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
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And so on. Please evaluate the following nouns:

	Italian	German	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
1	il lavoro (M)	die Arbeit (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
2	il matrimonio (M)	die Ehe (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
3	il perdono (M)	die Vergebung (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
4	l'amore (M)	die Liebe (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
5	il peccato (M)	die Sünde (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
6	la primavera (F)	der Frühling (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
7	la morte (F)	der Tod (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
8	la fede (F)	der Glaube (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
9	il fiore (M)	die Blume (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
10	il sole (M)	die Sonne (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
12	la luna (F)	der Mond (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
13	la mela	der Apfel	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd

	Italian	German							
	(F)	(M)	are fine						
14	la pioggia (F)	der Regen (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
15	lo spazzolino da denti (M)	die Zahnbürste (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
16	l'orologio (M)	die Uhr (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
17	il giornale (M)	die Zeitung (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
18	la chiave (F)	der Schlüssel (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
19	la palla (F)	der Ball (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
20	la poltrona (F)	der Sessel (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
21	il serpente (M)	die Schlange (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
22	il ragno (M)	die Spinne (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
23	il rospo (M)	die Kröte (F)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
24	la tigre (F)	der Tiger (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
25	la farfalla (F)	der Schmetterling (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd
26	la rana (F)	der Frosch (M)	Italian is very odd	Italian is odd	Italian is slightly odd	Both languages are fine	German is slightly odd	German is odd	German is very odd

- 1) Please look at your answers to words 1 to 8 (work, marriage, forgiveness, love, sin, spring, death and faith). If some words seemed particularly odd to you with the German grammatical gender, or if some words seemed particularly odd to you with the Italian grammatical gender, please explain why. If no word seemed odd to you, please explain why you think that grammatical gender makes no difference for this type of words.
- 2) Now please look at your answers to words 9-14 (flower, sun, moon, apple, rain)². If some words seemed particularly odd to you with the German grammatical gender, or if some words seemed particularly odd to you with the Italian grammatical gender, please explain why. If no word seemed odd to you, please explain why you think that grammatical gender makes no difference for this type of words.
- 3) Moving on to object nouns (15-20: toothbrush, clock, newspaper, key, ball, armchair), if some words seemed particularly odd to you with the German or Italian grammatical gender, please explain why. If no word seemed odd to you, please explain why you think that grammatical gender makes no difference for this type of words.
- 4) Finally, moving on to animal nouns (21-26: snake, spider, toad, tiger, butterfly, frog), if some names stroke you as particularly odd with the German or Italian grammatical gender, please explain why. If no name seemed odd to you, please explain why you think that grammatical

² Item 11 was eliminated from analysis because of an incorrect translation.

gender makes no difference for this type of words.

5) If there are words whose grammatical gender seemed odd to you, which types of words were particularly striking:

Abstract entities (work, love, death, marriage, forgiveness, faith, sin, spring)	Very odd	Odd	Rather Odd	No opinion	Rather normal	Normal	Absolutely normal
Natural entities (sun, moon, flower, apple, rain)	Very odd	Odd	Rather Odd	No opinion	Rather normal	Normal	Absolutely normal
Objects (clock, key, toothbrush, ball, newspaper, armchair)	Very odd	Odd	Rather Odd	No opinion	Rather normal	Normal	Absolutely normal
Animals (snake, spider, toad, tiger, butterfly, frog)	Very odd	Odd	Rather Odd	No opinion	Rather normal	Normal	Absolutely normal

6) What do you make of these differences? Do you think that gender is just a matter of grammar, or that it reflects some characteristics of the objects, animals and concepts it applies to?

7) Considering all the nouns in the list, do you think that grammatical gender assignments are more natural in one of the two languages? Tick one of these four sentences:

- the German grammatical gender is more natural
- the Italian grammatical gender is more natural
- the German and Italian grammatical genders are equally natural
- the German and Italian grammatical genders are equally unnatural

8) [early bilinguals version]

Remembering the Italian gender assignment of words is difficult for me	Absolutely agree	Agree	Maybe agree	Neither agree nor disagree	Maybe disagree	Disagree	Absolutely disagree
Remembering the German gender assignment of words is difficult for me	Absolutely agree	Agree	Maybe agree	Neither agree nor disagree	Maybe disagree	Disagree	Absolutely disagree
When I speak Italian, I make errors by using German assignments instead of Italian ones	Absolutely agree	Agree	Maybe agree	Neither agree nor disagree	Maybe disagree	Disagree	Absolutely disagree
When I speak German, I make errors by using Italian assignments instead of German ones	Absolutely agree	Agree	Maybe agree	Neither agree nor disagree	Maybe disagree	Disagree	Absolutely disagree
I am interested in knowing which words have a different grammatical gender in the two languages	Absolutely agree	Agree	Maybe agree	Neither agree nor disagree	Maybe disagree	Disagree	Absolutely disagree
I try to understand why these words have different gender in the two languages	Absolutely agree	Agree	Maybe agree	Neither agree nor disagree	Maybe disagree	Disagree	Absolutely disagree