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THE GRAMMATICAL AND CONCEPTUAL GENDER OF ANIMALS IN SECOND LANGUAGE USERS

Benedetta Bassetti

GRAMMATICAL GENDER AND MONOLINGUAL COGNITION

Languages that have a grammatical gender system assign all nouns to one of two or more classes called 'genders'. 'Grammatical gender' (GG) is reflected in 'agreement', i.e. the GG of a noun determines changes in the form of constituents that refer to the noun or accompany it (for an overview, see Corbett, 1991, 2006). In many Indo-European languages, grammatical gender (GG) has two or three categories: Italian has two, i.e. 'masculine' and 'feminine', German has three, i.e. the previous two plus 'neuter'. In both languages, gender agreement shows in determiners (e.g., articles *il/lo* and *la* in Italian; *der*, *die* and *das* in German), in adjectives, and in anaphoric pronouns. For instance, a German speaker asking for a knife, a spoon or a fork has to use a male, female or neuter pronoun (*Gib ihn/sie/es mir mal rüber*, 'pass (masculine/feminine/neuter) it to me'). An Italian speaker would use a masculine *lo* for 'knife' and 'spoon', and feminine *la* for 'fork' (*passame**lo*** vs. *passame**la***). The grammatical gender of a noun is determined by 'gender assignment', a system of semantic and/or formal rules for grammatical gender. In Italian and German assignment is partly semantic (male referents are mostly grammatically masculine and female referents are grammatically feminine) and partly formal (depending on the form of the noun rather than on the sex of the referent). In these languages therefore gender assignment partly reflects biological sex, being used for female and male beings (like 'natural', or 'semantic, gender'); however, gender is assigned not only to nouns of sexed beings, but also to nouns of artifacts, natural kinds, and abstract concepts. Thus, 'assignment rules' are semantically arbitrary (albeit largely formally justified). In both Italian and German there are phonological and morphological rules. In Italian, most masculine nouns end in *-o* (plural *-i*) and most feminine ones end in *-a* (plural *-e*), although there are nouns ending in *-e* as well as exceptions. In German, some endings regularly co-occur with masculine or feminine gender (e.g., 90% of nouns ending in schwa /ə/ are feminine; 65% of those ending in *-el*/*en*/*er* are masculine). While German gender assignment depends on declensional class, the system is complicated because nouns are also marked for number and case. The German gender system is therefore less transparent than the Italian one.

The issue of interest here is the relationship between the morphosyntactic feature of grammatical gender and the masculinity and femininity of nouns' referents. In GG languages, besides the semantic core of nouns that refer to male and female beings, all other nouns (the semantic residue) are also assigned a gender, which is semantically arbitrary. Referents of feminine nouns include not only female referents (e.g. Italian *moglie*, 'wife', and *gallina*, 'hen'), but also male referents (*guardia*, 'guard'), asexual referents (*finestra*, 'window'), and referents of either sex (*aquila*, 'eagle', used for both male and female eagles), as well as referents with feminine connotations (e.g., *gonna*, 'skirt'), and referents with masculine connotations (e.g., *cravatta*, 'tie'). The same applies to the masculine gender.

The semantic arbitrariness of most assignment rules in GG languages is evident from cross-linguistic comparisons: Although it is possible to identify some semantic rules for assignment

within a single language (e.g., in German, predators are masculine; see Zubin and Kopcke, 1986, for an overview), cross-linguistic comparisons reveal little agreement on gender assignment across languages and especially across language families (Foundalis, 2002). For instance, the following words are feminine in Italian and masculine in German: 'faith' (*la fede*, *der Glaube*); 'butterfly' (*la farfalla*, *der Schmetterling*); 'armchair' (*la poltrona*, *der Sessel*); the following words are masculine in Italian and feminine in German: 'sin' (*il peccato*, *die Sünde*), 'spider' (*il ragno*, *die Spinne*), 'mattress' (*il materasso*, *die Matrazze*).

Grammatical gender therefore creates categories of entities that have nothing in common in the real world, but whose nouns belong to the same morphosyntactic class. For this reason, it is a good test-bed for research on the effects of language on thought, since there is no reason why a fox should be considered similar to a woman and a cat to a man. It is therefore not surprising that researchers interested in the effects of language on thought have investigated the effects of grammatical gender.

Sapir ruled out the possibility that grammatical gender might affect mental representations of entities: "It goes without saying that a Frenchman has no clear sex notion in his mind when he speaks of *un arbre* ("a-masculine tree") or of *une pomme* ("a-feminine apple")" (1921/2007, p. 77). However, there is evidence that grammatical gender affects real-life behaviors: Anthropomorphized objects and animals in German child stories follow the grammatical gender of their referent (Mills, 1986); Spanish-speaking consumers prefer brand names with masculine or feminine endings depending on the gender connotations of the product (e.g., *Aizo* for a beer, which is perceived as a 'masculine' drink, and *Aiza* for a fruit cocktail, Yorkston & De Mello, 2005).

Experimental research then tried to establish whether GG affects the conceptualization of artifacts, animals, natural kinds, and abstract concepts. Effects were found in a variety of tasks, albeit not consistently. In some of these tasks, effects could be due to the strategic use of GG, but in other tasks this is not a possible explanation. GG affects performance in 'name attribution tasks' and 'voice attribution tasks', where participants choose a male or female voice or name for animals and objects, in French and Spanish adults and children (Sera et al., 2002) and in French, German and Spanish adults, but not in English or Japanese controls (Flaherty, 1999; Mills, 1986). When targets have opposite gender in two languages, speakers of these languages make the opposite choice of voice, and effects are stronger with natural kinds than artifacts (Sera et al., 2002). GG also affects performance in 'semantic similarity rating' tasks. In some studies, participants matched pictures of animals and objects with pictures of female or male humans, and GG effects were found with objects, animals and natural kinds in French and Spanish adults (Flaherty, 1999), and with objects in Spanish and German speakers (Phillips & Boroditsky, 2003). Guiora's (1983) study found no overall effects of GG, but one third of sortings of objects with no gender connotations was consistent with GG, and none was inconsistent. In these tasks GG could be used strategically. Other similarity rating tasks involve matching two animals or artifacts out of a triad (therefore hiding the link between the task and gender assignment), and predict that participants will match targets with the same grammatical gender. Results show that Spanish GG affects adult and child speakers of French, German, and Spanish, but not English or Japanese controls (Flaherty, 1999, Martinez & Shatz, 1996; Vigliocco, Vinson, Paganelli, & Dworzynski, 2005). In these studies, GG is not used strategically -- sortings are never entirely consistent with GG, and some items are sorted in the same way across languages (Flaherty 1999), showing that GG is only one of the factors affecting performance in these tasks.

Various factors modulate the effects of grammatical gender: Age of participants, language of testing, and stimuli (whether materials are linguistic or not; whether referents are animate or not). First, GG effects only appear in children above the age of 8, at least in those languages where this variable has been tested (Flaherty, 2001; Mills, 1986; Nicoladis & Foursha-Stevenson, under review; Sera et al., 2002) -- this could be due to linguistic development, cognitive development or both. Second, effects are consistently found with speakers of Spanish and French (e.g., Sera et al., 2002), but not with speakers of German (e.g., Flaherty, 1999, and Imai, Saalbach, and Shalk, 2009, found effects, but Vigliocco et al., 2005, did not). It has been proposed that German grammatical gender has weaker effects because animate nouns are sometimes neuter, thus weakening the link between GG and biological sex (Vigliocco et al., 2005); a more likely explanation is that German has a more complex GG system than Spanish, both in terms of actual number of GG markers and of the regularity of the relation between a noun's GG and its ending. Third, effects are stronger with pictures accompanied by a linguistic label than with unlabelled pictures (Sera et al., 2002), or only show up with words but not with pictures (Vigliocco et al., 2005). This could be evidence of linguistic rather than conceptual effects. Also, while some researchers found GG effects with artifacts (Martinez & Shatz, 1996; Nicoladis & Foursha-Stevenson, under review), others found effects with animals but not with artifacts (Vigliocco et al., 2005). This shows that GG interacts with characteristics of concepts -- animals are attributed gender characteristics or connotations more than inanimate objects. Since objects and abstract concepts do not have biological sex, perhaps these entities are attributed feminine or masculine connotations, so that speakers of one language can consider 'love' a feminine emotion while speakers of another language consider it masculine.

In conclusion, research found effects of grammatical gender on monolinguals' performance in a variety of tasks, although these findings are not consistent and are affected by other factors. Different explanations have been proposed for these effects. One possibility is that GG affects conceptual representations of entitites, which are then perceived as being more or less masculine or feminine, or having masculine or feminine connotations. Alternative explanations include: The strategic use of GG, 'thinking for speaking', and category learning. One explanation is that GG is used as a strategy. Some tasks used to study the effects of GG on concepts in fact rely on gender attribution (e.g., voice attribution, name attribution, object-human similarity judgment), and participants might use GG as a strategy (but see Bassetti, 2007, for evidence that child participants do not report strategic use of GG). A second explanation is purely linguistic. GG language speakers are likely to make choices that allow them to talk about the referent without a conflict between the referent's GG and its name or voice. It is better to call an apple *Patricia* rather than *Patrick* because in speaking it will be necessary to refer to the apple as *she*, and this would be awkward if the apple was called *Patrick*. A third explanation is that GG effects are effects of category learning. Having found GG effects on object-human similarity ratings with a connectionist simulation, Eberhard, Scheutz and Heilman (2005) argue that categorization tasks only show that objects belong to the same category as human males or human females, not that objects are perceived as masculine or feminine. However, just because computers perform a learning task that leads to the same learning outcomes as in humans, it does not follow that humans learn in the same way. In conclusion, since the results reported above can be explained in different ways, in order to test whether GG affects perception of masculinity and femininity, it is necessary to use tasks that measure masculinity/femininity connotations -- such as the semantic differential task.

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GRAMMATICAL GENDER AND MONOLINGUALS' PERFORMANCE IN SEMANTIC DIFFERENTIAL TASKS

The 'semantic differential' emerged in the 1950s as a technique for measuring the connotative meaning of concepts (Osgood, Suci, & Tannenbaum, 1957). Concepts are presented as words (or phrases) or pictures. Participants rate each concept on a series of scales between bipolar adjective pairs, such as 'big-small' or 'cold-hot'. Ratings on adjectival scales provide a measure of three factors: 'Evaluation' (e.g., 'good-bad'), 'potency' (e.g., 'weak-strong'), and 'activity' (e.g., 'active-passive'). Participants' scores then create a representation of meaning in a geometric space that represents the direction of the rating (positive or negative) and its intensity (distance from the middle of the scale).

The semantic differential task (SDT) has been repeatedly used to test the effects of grammatical gender on the perceived masculinity and femininity of entities. Some studies used a straightforward masculinity-femininity scale. Two early studies that used nouns of objects as targets found effects of GG in Arabic speakers (Clarke, Losoff, Dickenson, McCracken, & Still, 1981), but not in Hebrew speakers (Guiora & Acton, 1979; Guiora & Sagi, 1978); in a more recent study (Sera et al., 2002), GG affected the ratings of artifacts and natural kinds in Spanish speakers but not in English controls. Since rating on a masculine-feminine scale is an explicit task, this type of research was criticized for testing participants' responses to words rather than to referents, and for measuring differences in strategies rather than in perception of reality (Herold, 1982). However, if GG was used strategically, participants should always give GG-consistent answers, and should rate targets at the ends of the scales, i.e. as masculine or feminine, rather than somewhere along the scale, i.e. as more or less masculine/feminine. Since this is not the case, either GG is not used as a strategy, or at least it is not the only one.

Other studies used various scales associated with masculinity and femininity, rather than a straightforward masculinity-femininity scale. A study of Chinese speakers (Tong, Chiu, & Fu, 2001) found that pseudo-words that contained the semantic radical for 'woman' were rated lower on potency and activity, compared with pseudo-words with the radical 'human being'. This study reveals a relationship between grammatical and conceptual gender as measured in SDTs, since the mere presence of a feminine gender marker in a linguistic label leads to higher femininity rating of its unknown referent. In Konishi (1993), German and Spanish monolinguals rated nouns of objects that have opposite GG in their languages (e.g. masculine *Apfel* and feminine *manzana*, 'apple'). The two groups gave opposite ratings to the same referent, with masculine nouns of artifacts rated higher in scales measuring potency (but not evaluation or activity). Mills (1986) compared German- and English-speaking adults and children who rated animals and artifacts on 15 semantic differential scales. For German speakers the ratings of grammatically feminine referents ('cat', 'mouse' and 'clock') correlated with the rating of 'woman' and the ratings of grammatically masculine and neuter referents correlated with 'man'. The English controls showed the same pattern of results, which reflected English speakers' choice of pronouns for referring to these entities in a cloze test, again showing the relationship between language and semantic differential ratings. In a study that looked at abstract concepts (Zubin & Kopcke, 1984), German speakers rated affect nouns such as 'sadness' and 'courage'. Grammatically feminine affect nouns were rated higher on introversion (a feminine characteristic), and grammatically masculine ones were

higher on extroversion, although results are marred by the absence of a control group with a different language background. Finally, Hofstätter (1963) compared German and Italian monolinguals' concepts of 'sun' and 'moon' using 24 scales and found no differences. Concepts of sun and moon are affected by culture (e.g., in Italian visual arts the sun is represented as male and the moon as female, and vice versa in German arts), so the absence of effects in this study shows that GG effects do not consistently show in SDTs.

While all the studies reported above used words as targets, other studies used pictures. Flaherty (1999) found GG effects on French and Spanish adults' ratings of pictures of objects and animals on various 2-point scales; no effects were found in English and Japanese controls. Flaherty (2001) replicated the study with English and Spanish children, and found GG effects only above age 10, i.e. later than in gender assignment tasks such as name attribution, where effects are established at age 8 (see above).

In conclusion, grammatical gender seems to affect semantic differential ratings, although some studies found no effects. GG effects appear mostly on scales measuring potency (Konishi, 1993; Tong, Chiu, & Fu, 2001), are weaker compared with tasks such as voice attribution tasks (Flaherty, 1999), and appear at a later age (Flaherty, 2001).

The results of SDT studies cannot be ruled out as a consequence of the strategic use of GG, or as linguistic effects or categorization effects. It appears that GG affects perceptions of entities, that are perceived as masculine or feminine. For animate entities, one possibility is that they are assigned their grammatical gender as default gender -- for instance, an Italian speaker would consider a fox as female by default, unless there is reason to believe that it is a male fox, and a mouse as male, unless there is reason to believe that it is a female mouse. An alternative explanation is that entities are perceived as having masculine or feminine connotations -- Germans might think that a mouse is a feminine animal, and Italians might consider it a masculine animal. This explanation has the advantage of accounting for ratings of inanimate entities, such as 'love' -- love cannot be attributed a gender, but it can be considered a masculine or feminine emotion. Since the SDT is supposed to measure connotations, this is probably the correct explanation.

The question is then how could a feature of grammar affect mental representations of entities in the real world. Researchers have suggested that when children learn language, the categorizations reflected in language could affect the categorization of entities in the real world. For instance, Bowerman wrote: "children are prepared from the beginning to accept linguistic guidance as to which distinctions – from among the set of distinctions that are salient to them – they should rely on in organizing particular domains of meaning" (Bowerman, 1985, p. 1285). There is indeed some evidence that children think that there is a link between the grammatical gender of a noun and the gender of its referent. Chini (1995) reports the case of a 3-year-old Italian girl who refused to accept that *vestito* ('dress') is masculine, because the dress belonged to her doll, and *vestito* "is for men" (i.e. *vestito* belongs to men because it is grammatically masculine). With older children, the association between GG and referents' gender could even be reinforced by explicit teaching. French parents correct children's GG errors by referring to the nouns' referents as *garçon* and *fille* ('boy' and 'girl', Nicoladis & Foursha-Stevenson, under review). What is presumably a trick to make grammar understandable to children could in fact reinforce children's intuition that GG is related to gender. There is evidence that German children associate grammatical gender with semantic rules before they learn formal GG rules, and when the two conflict

children choose the former, for instance using the female pronoun *sie* for *Rotkappchen* (Little Red Riding Hood) rather than the correct neuter pronoun, because *Rotkappchen* is a girl (Wegener, 2000). Finally, adults might look for logical explanations of the gender assignment of their mother tongue. For instance, Clarke, Losoff, and Rood (1982) report cases of Arabic speakers who explain that 'beard', a typical male attribute, is grammatically feminine because it is soft and pliable. The conflict between properties of the word (feminine GG) and properties of the referent (male connotation) is rationalized by concluding that there is something feminine about beards. It appears that there are many ways grammatical gender can creep into people's perception of entities. The next question is then what happens to those who speak two languages that assign opposite gender to the same entity.

GRAMMATICAL GENDER AND BILINGUAL COGNITION

Anecdotal and observational evidence show conceptual effects of learning or knowing more than one GG language. Adult speakers of two GG languages sometimes show a preference for the gender assignment of one or the other language for a specific entity. For instance, the German poet Rainer Maria Rilke preferred to talk about a masculine sun and a feminine moon, choosing the gender assignment of L2 French over L1 German (Hofstätter, 1963). In the other direction, the Italian-German bilingual daughters of Traute Taeschner forcefully insisted that the sun is a 'girl', in line with their L2 gender assignment, rather than a 'boy' as in their L1 Italian (Taeschner, 1983). Child L2 learners might try to rationalize why some entities are masculine or feminine in the L2, as in the case of a 7-year-old speaker of a grammatical gender-less language who rejected L2 French gender assignments when these contrasted with the masculine or feminine connotations of objects such as ribbons and stains (Kenyeres, 1938).

Experimental research on the effects of grammatical gender on bilinguals' cognition began with a pioneering study by Ervin (1962; this volume). Ervin asked Italian-English bilinguals to rate Italian pseudowords with masculine or feminine endings on four scales. Italian-dominant bilinguals rated grammatically feminine pseudowords as more feminine than grammatically masculine ones. However, English-dominant bilinguals, who had acquired English before age 6, were not affected by Italian gender markers. This study shows that a second language learnt early in life can eliminate L1 GG effects, even if the L2 is grammatical gender-less. However, this study used pseudowords as stimuli, so it shows that speakers of grammatical gender languages relate GG to gender, not that GG affects conceptual gender. In a recent study that used linguistic stimuli and a linguistic task, L2 learners and users assigned a masculine or feminine gender to L1 neuter words (Andonova, Gosheva, Schaffai, & Janyan, 2007). Users and learners of a grammatical gender L2 mostly followed the L2 assignment, whereas users and learners of a semantic gender L2 (English) performed randomly. The meaning of these results is unclear, as L2 learners and users might have used L2 GG strategically to perform this unusual task.

Other studies used non-linguistic stimuli. Two studies looked at bilinguals with a grammatical gender L1 and a semantic gender L2, tested in the L2 (English). Boroditsky and Schmidt (2000) used a paired associate learning task performed in English, and found that participants learnt proper names for objects and animals better when the English name was

consistent with the object's L1 GG. In a second experiment, participants described entities using three adjectives in L2 English; they produced more stereotypically feminine adjectives for referents whose nouns was feminine in their L1, and vice versa. Testing participants in L2 English reduced the possibility that effects are due to thinking-for-speaking, so results support the hypothesis of conceptual effects. Furthermore, since all items had opposite GG in the two languages, these are language effects rather than effects of referents' characteristics. L1 GG effects therefore appear in bilinguals whose L2 is grammatical gender-less. Unfortunately no information is provided about the L2 age of acquisition or proficiency of participants. Nicoladis and Foursha-Stevenson (under review) also found that L1 grammatical gender affects French-English bilingual children when tested in English. The children, who were bilinguals from birth, had to decide whether a toy (an animal or an artifact) was a boy or a girl. The bilingual children aged 8 to 10 were affected by L1 French GG, while English controls and younger bilinguals were not. These two studies of bilinguals tested in a semantic gender language show that GG effects are not artifacts of the language of testing, and are not reduced by knowledge of a semantic gender L2. On the other hand, one study looked at the effects of learning a grammatical gender L2 on native speakers of a semantic gender L1 (Kurinski & Sera, to appear). English-speaking learners of L2 Spanish performed a voice attribution task with objects as targets. Results show that voice attribution is affected by the grammatical gender of the objects in L2 Spanish, and this is linked to L2 proficiency. It appears that learning a grammatical gender second language might negatively affect cognition, leading to a misrepresentation of reality that does not exist in monolingual speakers of a semantic gender first language.

While bilinguals with a grammatical gender L1 and a semantic gender L2 are influenced by L1 grammatical gender, bilinguals whose L2 is also a GG language appear to differ from monolingual speakers of their L1. Phillips and Boroditsky (2003) tested bilinguals' concepts of entities that have opposite gender in their two languages. A group of Spanish-German and German-Spanish bilinguals performed a picture similarity task in L3 English. The L1 grammatical gender effect was negatively correlated with self-rated fluency, showing that higher proficiency in a language that assigns opposite gender to the same entity reduces the conceptual effects of L1 grammatical gender. Bassetti (2007) compared Italian monolingual and Italian-German bilingual children using a voice attribution task with pictures of artifacts that had opposite gender in Italian and German. Italian monolingual children preferred female voices for grammatically feminine objects; Italian-German bilinguals were not affected by Italian GG. The bilingual children did not prefer female voices for grammatically feminine referents even though they were being tested in Italian, a language in which referring to these referents as masculine would be awkward. This shows that the effects of GG on voice attribution tasks cannot be dismissed as 'thinking for speaking'. It appears that knowledge of two GG languages reduces the effects of L1 grammatical gender.

Finally, two studies tested the effects of learning an artificial language. In Boroditsky, Schmidt, and Phillips (2003), English-speaking adults learnt a series of object nouns in an artificial language. Nouns belonged to one of two categories, one comprising objects and male humans, and one comprising objects and female humans. After learning the objects' nouns, participants rated the similarity of the objects with female or male humans. Their similarity judgments were influenced by the two-gender system they had learnt. Adult speakers of a semantic gender language who learn the grammatical gender system of an artificial language show effects in their similarity judgment tasks in line with the effects found in native speakers of GG languages, at least in tests immediately following the learning

task. A connectionist network trained with words in two languages, English and either Spanish or German, also produced similarity ratings that were affected by GG (Dilkina, McClelland, & Boroditsky, 2007).

The above two studies on bilinguals with two GG-languages (Phillips & Boroditsky, 2003; Bassetti, 2007) show that grammatical gender effects on cognition differ between monolinguals and bilinguals whose two languages assign opposite genders to the same entities. The main limitation of the above studies is that grammatical gender could have been used as a strategy to perform the tasks (object-human similarity ratings and voice attribution). The present study aims at testing the conceptual effects of knowing two GG languages through a task that measures connotative meaning.

GRAMMATICAL AND CONCEPTUAL GENDER OF ANIMALS IN MONOLINGUALS AND BILINGUALS

Aims and Hypotheses

This study aimed at comparing the effects of grammatical gender on the perceived masculinity and femininity of animals in monolinguals and bilinguals using a semantic differential task. Italian monolinguals, German monolinguals, and Italian users of German as a Second Language (GSL) rated a series of animals on various semantic differential scales. Animals were used as targets because GG effects appear more consistently with animals than artifacts (Sera et al., 2002), and were presented as drawings without linguistic labels to avoid the potential confound of grammatical gender marking. All animals had opposite grammatical gender in the two languages. It was predicted that GG would affect performance on the SDT, but it would not determine it, i.e. answers would not be entirely due to GG. It was predicted that the Italian and German monolinguals would give opposite ratings, as all targets had opposite gender in the two languages. Italians who know L2 German were expected to differ from Italian monolinguals, because of their knowledge of two languages that assign opposite grammatical gender to the same referent.

This is the first study to look at the effects of grammatical gender in users of two grammatical gender languages using a semantic differential task (SDT). Previous research that tested grammatical gender effects on the representation of entities in bilinguals used voice attribution (Bassetti, 2007), object-human similarity rating (Phillips & Boroditsky, 2003) or other gender attribution tasks (Andonova et al., 2007; Nicoladis & Foursha-Stevenson, under review). Since the SDT is intended to measure connotative meaning, differences between bilinguals and monolinguals on this task might be better evidence of a conceptual effect of bilingualism. In the only previous study of GG effects in bilinguals that used the SDT (Ervin, 1962), targets were pseudowords, and the bilinguals' L2 did not have grammatical gender. This study instead compared bilinguals with two GG languages who were rating concepts of real-world entities.

Participants

There were 48 participants: 16 German monolinguals, 16 Italian monolinguals and 16 Italian users of German as a Second Language (GSL). The groups were similar in age (Italians: M = 30, range: 22-64; Germans: M = 29, range 20-62; Italian GSL users: M = 31, range 21-41) but

differed in gender composition (number of males: Germans 7, Italians 10, Italian GSL users 4).

The Italian GSL users were native speakers of Italian who had started learning German mostly between age 10 and 15 (M = 13, SD = 5, with one age of onset of acquisition of 6 and one of 26) and had been L2 users of German for 19 years on average (SD = 6). They rated their own knowledge of German as 'intermediate' or 'advanced' on a 5-point scale (88 and 12 percent respectively).

Most participants in all groups spoke English and reported an intermediate or advanced proficiency level (88 percent of Germans, 81% of Italians, 69% of Italian GSL users). Knowledge of English was not expected to influence the results of this study because bilinguals with L2 English are affected by L1 grammatical gender (Boroditsky et al., 2003), unless they are English-dominant immigrants with an early age of arrival (Ervin, 1962). While none of the Italian monolinguals had been exposed to any Germanic languages, all the German participants had learnt a Romance language (mostly French), since age 12-14, but mostly rated themselves as beginners (69%), with a few intermediates (31%).

Procedure

Participants filled in an online questionnaire. Each animal was evaluated using a 7-point semantic differential scale consisting of 7 adjective pairs measuring evaluation and potency. Items were always presented in the same order. Participants made their rating by clicking on a scroll-down list. They were instructed to rate the animal rather than the drawing (e.g. they had to rate the beauty of 'mice' rather than the beauty of the mouse picture on the questionnaire). The SDT was followed by a questionnaire. Participation was voluntary and unpaid.

Materials

The web questionnaire contained: Instructions; 14 items, each consisting of the drawing of an animal followed by seven 7-point semantic differential scales; a questionnaire about biographical and linguistic background; and space for providing feedback. There were two versions, one written in German and one in Italian. Both had been translated from English by qualified and experienced translators. Participants only saw the questionnaire in their first language (i.e., bilinguals saw the Italian questionnaire).

The 14 animals were presented using line drawings (which are displayed in Appendix 16.A). Pictures were used rather than words to avoid effects of gender marking. Drawings were black-and-white in order to avoid the gender connotations of colors (Flaherty, 2001), and were selected from royalty-free collections published in the UK to avoid cultural effects on the visual representation of animals. All animals had opposite grammatical gender in Italian and German. The seven 'masculine animals' had a noun that is masculine in Italian and feminine in German, and the seven 'feminine animals' were feminine in Italian and masculine in German. The Italian nouns had the appropriate phonological ending for their grammatical gender (/a/ for feminine nouns, /o/ for masculine nouns), except for two male and two female animals that ended in /e/ ('pigeon' (M), 'snake' (M), 'tiger' (F), and 'fox'

(F)). The grammatical gender of nouns in German was established using a dictionary, and confirmed with a pilot study in which five German native speakers wrote down a (gender-marked) definite article and a noun for each of the drawings. Only items that elicited 100% consistent responses were selected.

Below each animal drawing there were seven 7-point semantic differential scales. Five scales used the following adjective pairs: 'good-bad'; 'weak-strong'; 'clean-dirty'; 'beautiful-ugly'; 'soft-rough'. Due to difficulties in finding antonyms, and therefore difficulties in ensuring linearity between two polar opposites, two scales were presented as 7-point Likert-type scales evaluating one adjective ('disgusting' and 'dangerous'). The scales had sufficient reliability, Chronbach's $\alpha = .69$. The adjectives were not obviously related to masculinity and femininity, so that the purpose of the study was masked. The scales also met the criterion of relevance to the concept being measured, as most of them had been used to measure, or had been shown to correlate with, masculinity-femininity in previous SDT studies ('Beautiful': Ervin, 1962; Konishi, 1993; Mills, 1986; Osgood et al., 1957; Zubin & Kopcke, 1984. 'Good': Ervin, 1962; Konishi, 1993; Osgood et al., 1957. 'Clean': Osgood et al., 1957. 'Soft': Mills, 1986; Zubin & Kopcke, 1984. 'Weak': Ervin, 1962; Konishi, 1993; Mills, 1986; Zubin & Kopcke, 1984). The scales measured evaluation (ugly, bad, dirty and disgusting) and potency (strong, rough and dangerous). In order to facilitate the task, each scale was presented as a scroll-down list, and cells were labelled with the format 'very x', 'x', 'rather x', 'neither x nor y', 'rather y', 'y', 'very y'. The scales varied in polarity direction: In two scales the masculine end was at the top of the list and in three at the bottom.

Results

Ratings were scored from -3 to +3, with 0 being the midpoint and -3 denoting 'masculine', so that higher scores indicate higher levels of femininity. For each participant, mean scores were calculated for each animal on each scale. Table 16.1 and Figure 16.1 show the mean ratings of grammatically masculine and grammatically feminine animals on each scale by group.

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Scale	Germans			Italian GSL users			Italians		
	F	M	Diff.	F	M	Diff.	F	M	Diff.
Ugly *Brutto* *Häßlich*	1.30	0.07	1.23	1.25	-0.24	1.49	1.84	-0.19	2.03
Dirty *Sporco* *Schmutzig*	1.05	0.48	0.57	1.13	0.21	0.92	0.91	-0.19	1.10
Bad *Cattivo* *Schlecht*	1.33	0.72	0.61	0.28	-0.03	0.31	0.78	0.44	0.34
Disgusting *Disgustoso* *Eklig*	2.65	1.28	1.37	2.24	0.51	1.73	2.15	0.30	1.85
Strong *Forte* *Stark*	-0.36	0.24	-0.60	-0.39	0.07	-0.46	-0.12	0.27	-0.39
Rough *Ruvido* *Hart*	0.02	0.21	-0.19	0.29	-0.14	0.43	0.72	-0.12	0.84
Dangerous *Pericoloso* *Gefährlich*	1.49	1.30	0.19	1.32	0.74	0.58	1.08	0.57	0.51

Table 16.1. Mean rating of grammatically masculine and feminine animals by scale and group.

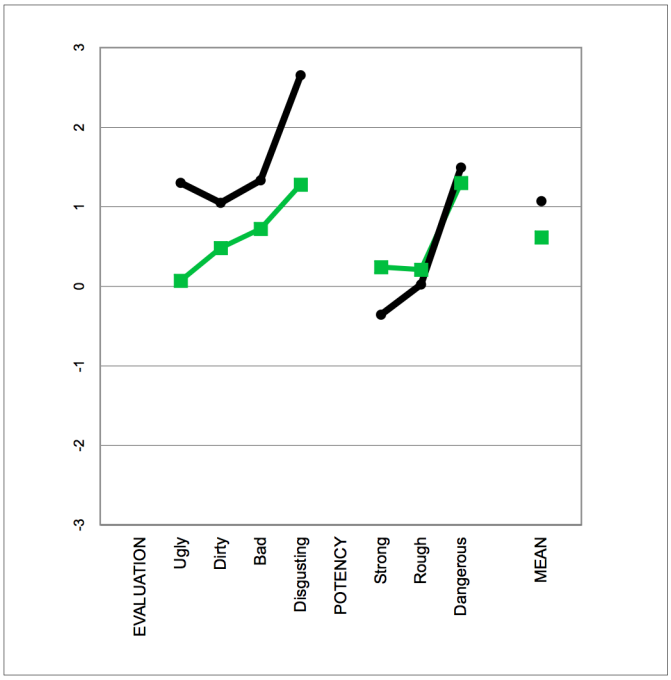

Figure 16.1a: German monolinguals

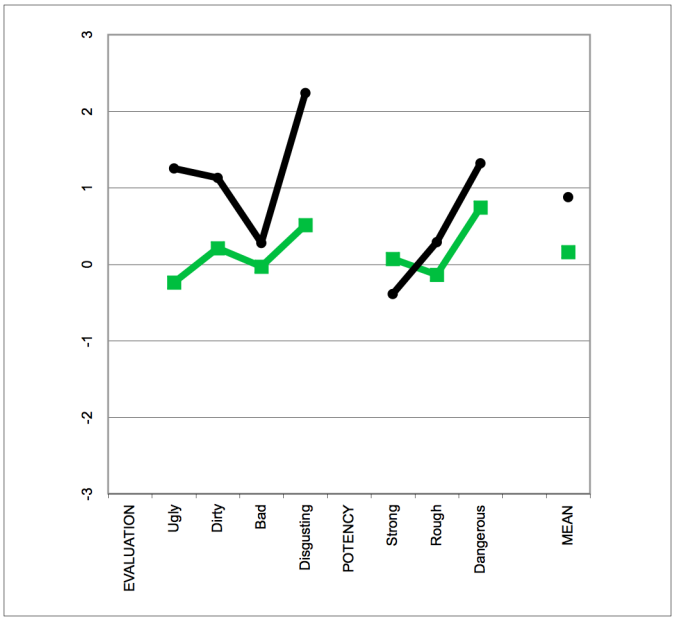

Figure 16.1b: Italian users of German as a Second Language

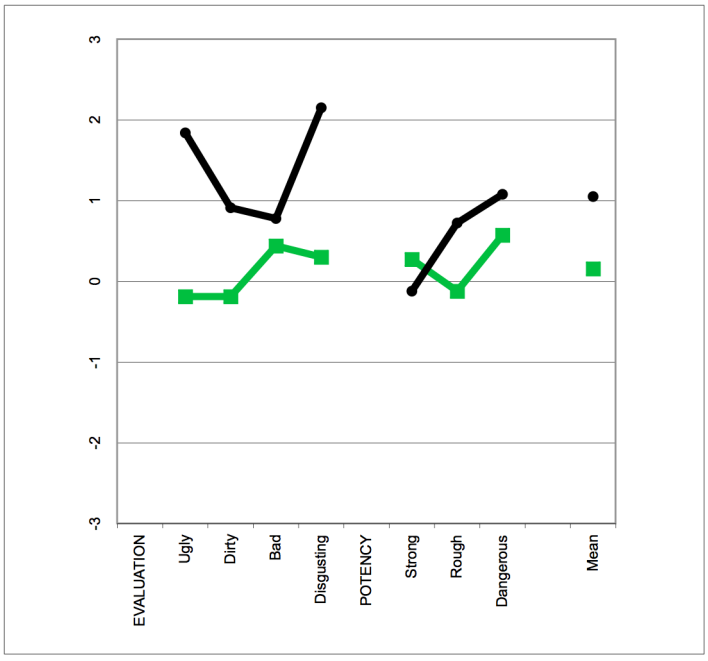

Figure 16.1c: Italian monolinguals

Figure 16.1. Profiles of masculine (grey line) and feminine (black line) animals on the 7 scales, and mean across all scales, by group.

With regards to grammatically feminine animals, in scales measuring evaluation they were rated by all groups as being on the feminine half of all scales (above 0, on the right-hand-side in the profiles), and overall as more feminine than grammatically masculine animals. On potency scales, Germans rated grammatically feminine animals as more masculine than Italians, and overall as more masculine than masculine animals. Italians and Italian GSL users rated feminine animals as more feminine on two scales and as more masculine on the strong-weak scale, possibly reflecting characteristics of the animals (feminine animals included 'eagle', 'tiger', and 'fox', whereas the only strong masculine animal was 'snake'). The difference between feminine and masculine animals was larger in the Italian monolingual group than in the Italian GSL users group.

With regards to masculine animals, the German monolingual group rated them on the feminine half of all the scales, probably because these animals are feminine in their language. The Italian and Italian-German bilingual groups rated masculine animals around the midpoint of all scales, slightly more masculine on some scales and slightly more feminine on others. The ratings of Italian and Italian-German participants could reflect the fact that the female gender is marked in Italian, and therefore leads Italian speakers to categorize grammatically feminine referents as more feminine, whereas masculine gender is unmarked and its referents are not considered either masculine or feminine. This is in line with findings by Bassetti (2007) that Italian children attribute a female voice to grammatically feminine referents but do not choose a male voice for masculine referents.

Table 16. 2 shows the mean ratings for feminine and masculine animals by group. For each participant, the mean difference in rating between feminine and masculine animals was calculated by subtracting the mean rating for grammatically masculine animals from the mean rating for grammatically feminine animals. While all groups rated grammatically feminine animals as more feminine than masculine ones, the mean difference between the perceived femininity of feminine and masculine animals was largest among Italian monolinguals and smallest among German monolinguals, with the Italian-German bilinguals in between.

Language background	Feminine Animals	Masculine Animals	Difference
Germans	1.07 (0.42)	0.62 (0.43)	0.45 (0.33)
Italian GSL users	0.87 (0.27)	0.16 (0.36)	0.71 (0.36)
Italians	1.06 (0.22)	0.16 (0.37)	0.90 (0.38)

Table 16.2. Mean femininity rating of grammatically feminine and masculine animals and mean difference between the two ratings, by group.

A mixed 3 x (2) ANOVA was performed with language background (German monolingual; Italian GSL user; Italian monolingual) as a between-group factor, and grammatical gender (grammatically masculine; grammatically feminine) as a within-group factor. There was a main effect of grammatical gender, $F_{1, 45} = 179.23$, $p < .001$, $r = .89$, showing that grammatically feminine animals were rated as more feminine across groups. The effect of language background, $F_{2, 45} = 4.87$, $p = .012$ $r = .31$ was qualified by the interaction, $F_{2, 45} = 6.26$, $p = .004$, $r = .35$. Bonferroni t-tests revealed that the difference in rating between feminine and masculine animals was larger in the Italian monolingual group than in the German monolingual group ($p = .003$), whereas the Italian-German bilinguals did not differ from either the Italian or German monolinguals ($p = .458$ and .134 respectively).

Mean evaluation and potency were then computed for masculine and feminine animals for each participant. Evaluation was a composite of 'ugly', 'bad', 'dirty', and 'disgusting'; potency was a composite of 'strong', 'rough', and 'dangerous'. Figure 16.2 shows the mean difference between ratings of feminine and masculine animals on potency and evaluation scales by groups. On both potency and evaluation scales, feminine animals were rated as more feminine than masculine ones across groups, but the Italians had the largest difference, the Germans had the smallest difference, and the Italian GSL users were in-between. Italian and German monolinguals gave opposite ratings on potency scales, as Italians rated feminine animals as more feminine than masculine ones (above 0), while Germans rated them as more masculine than masculine ones (below 0).

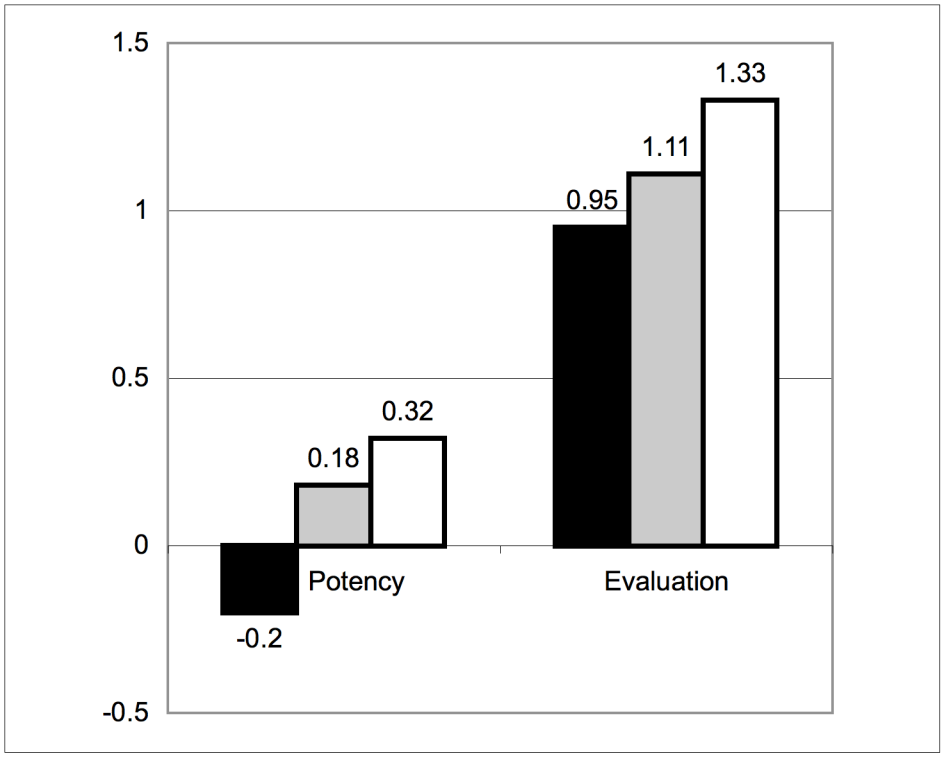

Figure 16.2. Mean differences between the ratings of grammatically feminine and masculine animals on potency and evaluation scales by group (black = Germans, grey = Italian GSL users, white = Italians).

Two mixed 3 x (2) ANOVAs were performed on potency and evaluation. For potency there were no main effects of grammatical gender ($F_{1, 45} = 2.62$, $p = .112$) or language background ($F_{2, 45} = 2.54$, $p = .090$), but the interaction was significant, $F_{2, 45} = 6.33$, $p = .004$, $r = .35$. Bonferroni post-hoc tests revealed that the difference in potency between feminine and masculine animals was smaller in the German group than in the Italian group ($p = .004$) and in the Italian GSL users group ($p = .047$), but the Italian monolinguals and Italian GSL users did not differ ($p = 1.000$). For evaluation, there were main effects of grammatical gender ($F_{1, 45} = 270.70$, $p < .001$, $r = .93$) and language background ($F_{2, 45} = 3.61$, $p = .035$, $r = .27$), but no interaction ($F_{2, 45} = 2.61$, $p = .085$).

An item analysis was performed to test whether specific animals were rated differently across groups. For each participant, the mean rating across all animals was subtracted from the rating for each animal. Results are shown in Table 16.3 (a negative figure indicates that the animal was rated as more masculine than the mean rating for participants in that group, and vice versa). A series of ANOVAs was then performed to compare the three groups' differences in rating from the mean for each of the animals. Animals whose ratings differed across groups were: Mouse, toad, snake, fox, starfish, butterfly, and stork. Germans differed from Italians because they rated mouse, toad, and snake as more feminine, and butterfly and stork as more masculine, in line with the German grammatical gender of these animals. There were no differences between Germans and Italian GSL users. Italian GSL users differed from Italians because they rated starfish and butterfly as more masculine, in line with the German GG. Fox was rated as more masculine by Germans than either of the Italian groups, but the post-hoc tests did not reach significance ($p = .06$ for Italian GSL users and .073 for Italians).

Animal	**German monolinguals**	**Italian GSL users**	**Italian monolinguals**	**Sig.**	**Post-hoc sig.**
Spider	-.95	-.89	-.83	.956	
Mouse	.34	-.22	-.10	.011*	De-It = .011
Crab	-.58	-.26	-.60	.108	
Pigeon	-.06	.33	.27	.118	
Toad	-.24	-.65	-.78	.034*	De-It = .034
Owl	.06	-.17	-.28	.982	
Snake	-.33	-.70	-1.08	.001**	De-It < .001
Frog	.10	-.05	-.36	.115	
Tiger	.15	.31	.13	.275	
Eagle	-.16	.20	.00	.300	
Fox	-.19	.33	.36	.031*	
Starfish	.21	.01	.64	.025*	It-GSL = .027
Butterfly	.87	.94	1.58	.013*	De-It = .018
Stork	.19	.35	.68	.002*	De-It = .002 It-GSL = .046

Table 16.3. Distance from the mean by item by group (a positive figure indicates that the animal was rated as more feminine than the group's mean for all animals), ANOVA significance and Bonferroni post-hoc significance (De = German monolinguals, It = Italian monolinguals, GSL = Italian GSL users).

DISCUSSION AND CONCLUSIONS

A semantic differential task was used to measure the effects of grammatical gender on the perceived masculinity-femininity of animals in German monolinguals, Italian monolinguals, and Italian native speakers with knowledge of German as a Second Language. Although participants were expected to rate animals on the basis of non-linguistic considerations, language effects were expected. It was predicted that the two monolingual groups would give opposite ratings, and that the Italian GSL users would differ from Italian monolinguals. Results show effects of grammatical gender on conceptual gender in all groups, but differences are mostly evident in the intensity rather than the directionality of ratings. As predicted, effects are weaker in those who know a grammatical gender second language, compared with monolingual speakers of their first language.

Effects of Grammatical Gender on Monolinguals

Overall, results reveal effects of grammatical gender on conceptual gender, although as expected GG was not the only or indeed the main factor affecting ratings. Italian monolinguals appear to be strongly affected by Italian grammatical gender. They rated feminine animals about one point above the midpoint, with an average difference of almost one point in femininity rating between grammatically feminine and masculine animals. Italians rated masculine animals at the midpoint rather than in the male half of the scale. This contradicts predictions, but it is in line with previous findings. Bassetti (2007) found that Italian children prefer female voices for grammatically feminine referents and show no preference for male or female voices for grammatically masculine referents. The researcher argued the feminine gender is marked in Italian and could therefore be associated with femininity more than the masculine gender is associated with masculinity. Since fewer nouns have feminine than masculine gender, it follows that a higher proportion of referents of feminine nouns are female, compared with the proportion of referents of masculine nouns that are male. Since the masculine gender is unmarked, and it covers many nouns that were neuter in Latin, it is a less reliable clue to the gender of the referent compared with the feminine gender, and therefore GG effects do not appear in either voice attribution or semantic differential rating tasks.

The results also show GG effects in German speakers. While previous research often found GG effects in speakers of Romance languages, evidence from German speakers is inconsistent (e.g. Imai et al., 2009; Vigliocco et al., 2005). While the present study provides more evidence of GG effects in German speakers, these are evident from comparisons with Italian monolinguals, rather than on their own, and are evident more in the intensity than in the directionality of ratings. There is a difference between Germans and Italians in the directionality of rating of masculine animals, which Germans rated on average in the feminine half of the scale, arguably because these animals are feminine in German. However, German speakers rated grammatically feminine animals on average one point above the midpoint, like Italian monolinguals. Since these animals were masculine in German, they should have been rated around the midpoint or in the masculine half of the scale. With regards to the difference between femininity of feminine and masculine animals, Germans rated animals that were grammatically feminine as more feminine. However, the difference was about half a point in the German group, compared with almost 1 point in the Italian group, i.e. it was exactly half the size (.45 vs. .90). Thus, the direction of rating in both

monolingual groups is consistent with Italian grammatical gender, as both groups rated grammatically feminine animals closer to the feminine end of scales than grammatically masculine animals. The effects of German GG are then evident not in the directionality, but in the intensity of rating. It appears that effects of GG show in German speakers, but are weak. Effects are only apparent in comparison with Italian speakers, and then only in intensity and not in directionality.

The weak effects of German GG could have a linguistic explanation, for instance because German has three rather than two gender classes (Vigliocco et al., 2005), or because it has a more complex GG system, with a larger number of endings that provide less reliable clues to GG, compared with Italian or Spanish. While it is possible that GG affects German speakers less than speakers of Romance languages for linguistic reasons, a non-linguistic explanation is also possible. Italian GG assignment might reflect universals of perception of masculinity-femininity. Overall, all participants regardless of L1 rated those animals that were grammatically feminine in Italian on the feminine half of the scale, and as more feminine than grammatically masculine animals. The feminine rating of feminine animals across groups, both in absolute terms and in comparison with masculine animals, might reflect a general agreement between the Italian gender assignment and universally perceived characteristics of its referents. Sera et al. (2002) argued that the Spanish gender assignment is more universal than the German one. Since Italian and Spanish gender assignments are very similar (Foundalis, 2002), it is possible that animals that are feminine in Italian but masculine in German are generally perceived as more feminine. If this is indeed the case, then part of the GG effects in Romance speakers would be in fact due to universals of masculinity-femininity perception, and vice versa the effects of German GG would be weaker with targets that have opposite gender in Romance languages and in German. German GG would then appear stronger in those items that have the same grammatical gender as in Romance languages, as the latter effects would not be reduced by universals of femininity-masculinity perception. This would then not be a linguistic explanation, linked to characteristics of the gender systems of different languages, but a cognitive explanation, linked to universals of perception of masculinity-femininity. Future research could investigate this possibility by comparing items that have opposite gender in the two languages with items that have the same gender. Future research should also test participants from other cultural backgrounds. Although previous researchers used English speakers as controls (e.g., Martinez & Shatz, 1996; Mills, 1986), these controls still share similar cultural backgrounds with speakers of Romance and Germanic languages. In order to rule out possible effects of European culture, more research should look at participants with non-European cultural backgrounds (as done by Flaherty, 1999). Finally, many German participants in this study had learnt a Romance language, and this might have reduced the effects of German GG in their ratings. Future research might look at Germans with no knowledge of Romance languages.

The prediction that Germans and Italians would give opposite ratings to the same referents was not confirmed by overall ratings, but it was confirmed by ratings on potency scales. On evaluation scales both groups gave higher ratings to feminine than masculine animals, and the difference was only in intensity. On the other hand, on potency scales the difference between feminine and masculine animals was positive in the Italian group and negative in the German group. This shows that Germans rated grammatically feminine animals as more masculine than masculine ones on potency scales. Ratings on these scales then reveal effects of GG, as the same items received opposite ratings by the two monolingual groups, in line with the GG of referents in their languages. It is not surprising that the predicted differences

should only show in potency scales. Previous research had consistently found effects of GG on potency scales (Konishi, 1993; Tong et al., 2001; the latter found no effects on evaluation scales). Furthermore, masculinity-femininity was associated with potency in Osgood et al. (1957). Future research that compares GG effects across groups of speakers of different languages could concentrate on potency ratings.

The item analysis reveals that Italians' and Germans' ratings differed significantly on just over one third of animals. Germans rated mouse, toad, and snake as more masculine than Italians, and stork and butterfly as less feminine. All these differences are in line with predictions based on participants' L1 gender assignment, confirming that these are probably language effects.

Finally, results confirm that the semantic differential task is a suitable tool for measuring the effects of grammatical gender on conceptual gender. First of all, grammatical gender was not used strategically to perform the task: The task was not obviously related to gender, participants did not rate animals at the ends of scales as would happen if they were relying on GG, GG affected but did not determine ratings, and Italian and German monolinguals did not give opposite ratings. Furthermore, ratings were affected by the animal's characteristics more than by gender. For instance, all participants rated snakes as masculine, although 'snake' is feminine in German (*Die Schlange*). All participants also considered frogs more feminine than toads, although in German 'frog' is masculine (*Der Frosch*) and 'toad' is feminine (*Die Kröte*). This means that participants were performing the task in a meaningful way, rating animals on the basis of their characteristics and connotations.

The use of the semantic differential task also helps shed light on the nature of GG effects. Results from this task cannot be explained in terms of category learning. While nouns and voices can be associated with animals that belong to the same category 'masculine' or 'feminine', the category learning hypothesis could not explain why some animals are rated as more feminine than others. Also, these effects cannot be due to thinking-for-speaking. When speaking Italian, it is necessary to refer to foxes as females and mice as males, which makes it sensible to choose a female voice or name for a fox and a male one for a mouse. However, thinking-for-speaking cannot explain differences in femininity ratings. The SDT therefore seems a suitable task to test the effects of grammatical gender on conceptual gender, because it measures the perceived masculine and feminine connotations of entities, especially if researchers focus on potency measures.

Grammatical Gender and Bilingualism

As predicted, the Italian native speakers who knew German as a Second Language differed from Italian monolinguals. As is the case with Germans, the difference was not in the direction of rating, but in the intensity. Like Italian monolinguals, Italian GSL users rated feminine animals in the feminine half of the scale, masculine animals around the midpoint, and feminine animals as more feminine than masculine ones. However, the Italian GSL group was in between the two monolingual groups: (1) the difference in overall femininity rating between feminine and masculine animals in the bilingual group was in-between the two monolinguals' groups, and there was no statistically significant difference with either group; (2) the difference in potency rating between feminine and masculine animals in the bilingual group was about half of the Italian group's difference, although it differed significantly from the Germans' difference (which was negative); (3) the difference in evaluation rating was

about halfway between the two monolingual groups' differences, and no statistical differences were found with either group. Overall, on all measures the difference between grammatically feminine and masculine animals was largest among Italians and smallest among Germans, with the Italian GSL group's ratings in between.

All the differences between Italian GSL users and the two monolingual groups were in the direction predicted by their language combination. GSL users considered animals that are grammatically feminine in Italian and masculine in German as more masculine than the Italian group and more feminine than the German group. Across all measures, the difference between Italian GSL users and the two monolingual groups was in intensity of rating. With potency ratings, animals that are feminine in Italian and masculine in German were rated as less potent by Italians and more potent by Germans. On these scales, the two monolingual groups have a difference in directionality, whereas the Italian monolingual and Italian GSL users groups differ in intensity. This is the only measure on which Italian GSL users differ from German monolinguals in directionality. Finally, the item analysis reveals that Italian GSL users differ from Italian monolinguals on only two animals, compared with the five animals that were rated differently by the two monolingual groups. However, both differences were in line with predictions (both animals were feminine in Italian and masculine in German, and were rated as more masculine by Italian GSL users than Italian monolinguals), and there were no differences between Italian GSL users and German monolinguals, again confirming that Italian GSL users differ from Italian monolinguals.

Results confirm the hypothesis that speakers of a GG L1 who learn a GG L2 with different gender assignment differ in their performance on semantic differential tasks from Italian monolinguals. It is argued that learning a GG L2 affects conceptual gender as reflected in STD ratings that are likely to be measures of masculine and feminine connotations. This could be an overall effect of learning a GG second language, as learning a new GG assignment system might reveal the semantic arbitrariness of L1 grammatical gender assignments; alternatively, effects might be limited to those entities that have opposite grammatical gender in the bilinguals' two languages. Future research could compare ratings of entities that have opposite gender in the two languages and entities that have the same gender. This would clarify whether learning a grammatical gender L2 has a general effect of reducing the effects of L1 grammatical gender, or simply affects the perception of masculinity-femininity for the individual referents that have opposite GG in the two languages.

An interesting aspect of this study is that all (but one) bilinguals had learnt L2 German after age 8, which is the age when L1 grammatical gender effects appear in monolingual children (Flaherty, 2001; Mills, 1986; Nicoladis & Foursha-Stevenson, under review; Sera et al., 2002). This might mean that conceptual gender can be affected by experiences in later life. Future research could compare bilinguals from birth with bilinguals with ages of onset of acquisition above 8 years, to see whether those who learnt a GG L2 during the period of concept formation are more affected than late learners. Furthermore, future research could try to link L2 GG effects to proficiency (as in Phillips and Boroditsky, 2003), frequency of use, or other variables that have been found to correlate with effects of second languages on bilingual cognition (see Bassetti and Cook, this volume).

Finally, these findings might have implications for second language learning research. In general, learning L2 grammatical gender assignment is not easy (Holmes and Dejean de la

Bâtie, 1999; Rogers, 1987). Tight (2006) demonstrated that with unknown L2 words, learners assign gender based on their perception of the gender connotations of the word's referent. If therefore the referent is perceived as masculine or feminine due to the influence of L1 GG assignment, this could interfere with gender assignment in the second language. Indeed, White, Valenzuela, Kozlowska-MacGregor, and Leung (2004) report in an aside of their results section that French learners of Spanish make more gender errors when the referent has opposite gender in their first language (Dewaele and Véronique, 2000, found no L1 GG effects, but the L1 gender system of their participants does not have a masculine and feminine class). Future research could then look at the specific effects of L1 on L2 grammatical gender acquisition by focusing on specific items that have opposite grammatical gender in learners' L1 and L2, rather than on generic effects of knowing a gender L1 on L2 GG acquisition.

In conclusion, it is argued that bilingualism can affect concepts, at least when the bilingual's two languages represent the same entity or event differently. When the bilingual's two grammatical gender systems are in conflict, grammatical gender ceases to constitute a reliable clue, either overall or at least for those entities that have opposite gender in the two languages. Bilingualism therefore might eliminate a language-induced bias in the perception of entities. This means that the more languages people learn, the closer they get to an understanding of reality that is not affected by the biases induced by their first language.

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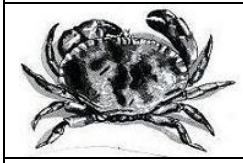
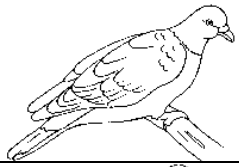
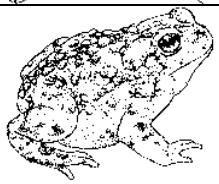
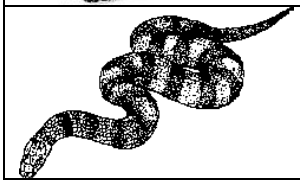
APPENDIX 16.A

List of items used in the semantic differential task

Masculine animals (masculine in Italian and feminine in German)			
Picture	**Italian noun**	**German noun**	**English translation**
	Il ragno	Die Spinne	Spider
	Il topo	Die Maus	Mouse
	Il granchio	Die Krabbe	Crab
	Il piccione	Die Taube	Pigeon
	Il rospo	Die Kröte	Toad
	Il gufo	Die Eule	Owl
	Il serpente	Die Schlange	Snake

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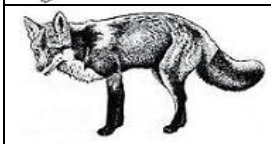
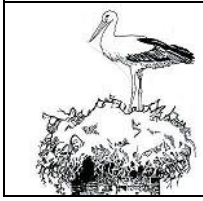
Feminine animals (feminine in Italian and masculine in German)			
Picture	**Italian noun**	**German noun**	**English translation**
	La rana	Der Frosch	Frog
	La tigre	Der Tiger	Tiger
	L'aquila	Der Adler	Eagle
	La volpe	Der Fuchs	Fox
	La stella marina	Der Seestern	Starfish
	La farfalla	Der Schmetterlings	Butterfly
	La cicogna	Die Storch	Stork