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The Effect of Grammatical Gender on Object Categorization

Roberto Cubelli and Daniela Paolieri
University of Trento

Lorella Lotto
University of Padova

Remo Job
University of Trento

In 3 experiments, we investigated the effect of grammatical gender on object categorization. Participants were asked to judge whether 2 objects, whose names did or did not share grammatical gender, belonged to the same semantic category by pressing a key. Monolingual speakers of English (Experiment 1), Italian (Experiments 1 and 2), and Spanish (Experiments 2 and 3) were tested in their native language. Italian and Spanish participants responded faster to pairs of stimuli sharing the same gender, whereas no difference was observed for English participants. In Experiment 2, the pictures were chosen in such a way that the grammatical gender of the names was opposite in Italian and Spanish. Therefore, the same pair of stimuli gave rise to different patterns depending on the gender congruency of the names in the languages. In Experiment 3, Spanish speakers performed the same task under an articulatory suppression condition, showing no grammatical gender effect. The locus where meaning and gender interact can be located at the level of the lexical representation that specifies syntactic information: Nouns sharing the same grammatical gender activate each other, thus facilitating their processing and speeding up responses, either to semantically related pairs or to semantically unrelated pairs.

Keywords: grammatical gender, object categorization, linguistic relativity, conceptual–semantic knowledge, lexical representation

Vygotsky (1962) illustrated the interdependence of the semantic and grammatical aspects of language by citing two examples in which changes in formal structure possibly entailed far-reaching changes in meaning:

> In translating the fable "The Grasshopper and the Ant," Krylov substituted a dragonfly for La Fontaine's grasshopper. In French, *grasshopper* is feminine and therefore well suited to symbolize a lighthearted, carefree attitude. The nuance would be lost in a literal translation, since in Russian *grasshopper* is masculine. When he settled for *dragonfly*, which is feminine in Russian, Krylov disregarded the literal meaning in favor of the grammatical form required to render La Fontaine's thought.
>
> Tiutchev did the same in his translation of Heine's poem about a fir and a palm. In German *fir* is masculine and *palm* feminine, and the poem suggests the love of a man for a woman. In Russian, both trees are feminine. To retain the implication, Tiutchev replaced the fir by a masculine cedar. Lermontov, in his more literal translation of the same poem, deprived it of these poetic overtones and gave it an essentially different meaning, more abstract and generalized. One grammatical detail may, on occasion, change the whole purport of what is said. (Vygotsky, 1962, pp. 221–222)

The grammatical aspect of language to which Vygotsky (1962) referred is grammatical gender, which is an inherent property of nouns and whose functions are mainly syntactic and morphological (Chomsky, 1965; Martinet, 1960). In many languages grammatical gender distinguishes nouns in two or more classes according to the morphological modifications they require in words syntactically associated with them. It has been described as a *nominal agreement class* (Corbett, 1991), and it is strictly related to inflectional paradigms (Aronoff, 1994). As a syntactic phenomenon, it is independent from meaning (Aronoff, 1994), but its relationship with semantic information is very intricate (see Wienold, 1967): To put it in a nutshell, "grammatical gender is neither completely arbitrary nor completely motivated" (Di Domenico, 1997).

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Roberto Cubelli, Daniela Paolieri, and Remo Job, Department of Cognitive Sciences and Education, University of Trento, Trento, Italy; Lorella Lotto, Department of Developmental Psychology and Socialization, University of Padova, Padova, Italy.

Daniela Paolieri is now at the Department of Experimental Psychology and Behavioural Physiology, University of Granada, Granada, Spain.

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Correspondence concerning this article should be addressed to Roberto Cubelli, Department of Cognitive Sciences and Education, Center for Mind/Brain Sciences, University of Trento, Corso Bettini, 31, I-38068 Rovereto (TN), Italy. E-mail: roberto.cubelli@unitn.it

In many gendered languages, the link between grammatical gender and word meaning appears to be completely unpredictable. Consider, for example, the term for *sun* that is masculine in Spanish (*sol*), feminine in German (*Sonne*), and neuter in Czech (*slunce*), or the term for *boat* that is feminine in Italian (*barca*), masculine in French (*bateau*), and neuter in German (*Boot*). Even if the words within each triplet are phonologically similar and refer to the same concept, in each language these nouns have different grammatical gender. Furthermore, within the same language, nouns of different gender may refer to the same object: Consider, for instance, the Italian noun pairs *sasso* (masculine) and *pietra* (feminine) for *stone*, *uscio* (masculine) and *porta* (feminine) for *door*, and *schiaffo* (masculine) and *sberla* (feminine) for *slap*.

Gender appears to be functionally independent from conceptual structure (Aronoff, 1994) and is assumed to be stored at a representational level that is different from that specifying semantic information (Caramazza, 1997; Levelt, Roelofs, & Meyer, 1999). Nevertheless, in several cases, gender classification systems seem to be based on relevant semantic properties of the nouns' referents, for example, biological sex or animacy (Corbett, 1991; Lakoff, 1987). The male–female distinction serves as the semantic basis of gender in Indo-European systems, while the animate–inanimate distinction is used in other languages, such as Ojibwa and other Algonquian languages. Moreover, semantic regularities correlated with gender have been observed. For example, in German, nouns denoting superordinate categories are usually neuter; nouns denoting apes, mammals, and birds tend to be masculine; and nouns denoting reptiles and insects tend to be feminine (Zubin & Köpcke, 1986). In Italian, most nouns denoting trees and names of rivers and seas are masculine, whereas most nouns denoting fruits and names of countries and cities are feminine (Dardano & Trifone, 1985; Serianni, 1988). Similarly, in Serbian, nouns referring to vegetables tend to be masculine, whereas nouns referring to fruits tend to be feminine (Mirkovič, MacDonald, & Seidenberg, 2005). In many languages, nouns that are semantically subordinate to a general term easily adopt the grammatical gender of the latter (Kurylowicz, 1964). In Italian and in Hebrew, the feminine suffixes are used to derive novel nouns, thus distinguishing related objects along precise semantic dimensions (the differential function of gender; Wienold, 1967). Consider, for instance, the Italian noun pairs *fosso* (*ditch*, masculine) and *fossa* (*hollow*, feminine), *tavolo* (*table*, masculine) and *tavola* (*table*, *bench*, *board*, feminine), and *cassetto* (*drawer*, masculine) and *cassetta* (*box*, feminine), where the opposite genders have distinctive values in the dimensions of size, specificity, and function similarity, respectively (Chini, 1995). Similar contrasting pairs are present in Hebrew (Ritter, 1993): Consider, for example, the nouns *magav* (*cloth*, masculine) and *magav-et* (*towel*, feminine), and *txun-a* (*feature*, masculine) and *txun-it* (*linguistic feature*, feminine), where feminine gender is used to refer to a more specific element.

Although grammatical gender appears to reflect semantic information, the reverse is also claimed to be true: Grammatical gender can influence meaning (Jakobson, 1959). In addition to the linguistic analysis offered by Vygotsky (1962), a large body of empirical evidence has been collected on this issue, admittedly with mixed results. There have been three types of approaches to the issue.

In one set of studies, participants have been asked to either produce or rate masculine and feminine characteristics in response to stimuli varying on grammatical gender, either real or implied. In a seminal experimental article, Ervin (1962) asked Italian speakers to rate pairs of nonwords that differed only for the ending vowel (either the predominantly masculine gender marker *–o* or the predominantly feminine gender marker *–a*; e.g., *gico* and *gica*). Participants attributed masculine connotations (e.g., big and strong) to stimuli ending in *–o* and feminine connotations (e.g., good and weak) to stimuli ending in *–a*. Similar findings have been reported for Arabic speakers but not for participants speaking Finnish, which is a genderless language (Clarke, Losoff, McCracken, & Rood, 1984; Clarke, Losoff, McCracken, & Still, 1981). Konishi (1994) also used nonwords to study gender connotations. Instead of gender-transparent nominal endings, gender-specific definite articles were used. German speakers rated stimuli with the masculine article *der* higher in potency than stimuli with the feminine article *die*. Spanish speakers, however, did not rate nonwords with the masculine article *el* and nonwords with the feminine article *la* differently. A number of studies have used semantic differential scales to investigate gender connotations (Hofstätter, 1963; Mills, 1986; Zubin & Köpcke, 1986). Crucially, Konishi (1993) asked Spanish and German speakers to rate objects' names with the same meaning but opposite gender; for example, the word *clock* is masculine in Spanish (*reloj*) and feminine in German (*Uhr*), whereas the word *apple* is feminine in Spanish (*manzana*) and masculine in German (*Apfel*). In both languages, grammatically masculine nouns were rated higher in potency than feminine nouns. However, no effect of gender was found for other critical dimensions (e.g., evaluation). In general, the studies that used semantic differential scales have obtained inconclusive results.

In a second set of studies, participants have been asked to associate words and concepts to the categories of male and female. Using a task that made explicit reference to the male and female properties of nouns, Sera, Berge, and del Castillo Pintado (1994) asked Spanish and English speakers to associate a male or a female voice to words and pictured objects. Unlike English speakers, Spanish speakers tended to follow the Spanish gender system in their assignments of voice, for both words and pictures. In a subsequent study, Sera et al. (2002) obtained the same effect with French-speaking children, but not with German speakers. Unfortunately, these results could reflect the use of strategies induced by the task, because participants were explicitly asked to classify words according to male–female properties; thus, speakers could use grammatical gender in a conscious manner.

Boroditsky and Schmidt (2000) employed a paired-associates learning task. In the learning phase, German–English and Spanish–English speakers were presented with a list of word pairs, each constituted by an object name (i.e., *chair*) and a person name (i.e., *Mary*). The experiment was conducted in English, but all objects were chosen to have names of opposite grammatical genders in Spanish and German. In the test phase, participants were asked to remember the gender of the proper name that had been associated with each object name. Both German and Spanish participants were more accurate when the gender of the proper name was consistent with the grammatical gender of the object name in their native language than when it was inconsistent. For example, German speakers were better at remembering the stimulus *apple* (a masculine noun in German) when it was associated with the name *Patrick* than when it was associated with *Patricia*. The opposite pattern was shown by Spanish speakers (the Spanish word for

apple is feminine). This pattern of results reveals that gender of L1 (first language) does affect learning in L2 (second language) long-term memory. However, because the object names were associated with person names, it is possible that the grammatical gender of the object name acted as a cue implicitly induced in the learning phase by the sex of the referent of the associated proper name.

A third set of studies has used tasks that minimize the possibility that participants could use grammatical gender in a strategic manner. Martinez and Shatz (1996) employed a free-classification task and reported that Spanish-speaking children were more likely than English-speaking children to use grammatical gender as a basis for sorting pictures of inanimate objects. Using the same task, Vigliocco, Vinson, Paganelli, and Dworzynski (2005) presented Italian, German, and English speakers with triplets of words or pictures referring to animals or artifacts and asked them to judge which two of the three were most similar in meaning. An effect of grammatical gender was observed only with Italian speakers and only when using written names of animals as stimuli.

In a widespread review, Boroditsky, Schmidt, and Phillips (2003) referred to some unpublished data suggesting that grammatical gender may alter nonlinguistic representation and that objects do have a conceptual gender. For example, German and Spanish speakers who were presented with a series of object pictures were asked to write down the first three adjectives that came to mind to describe each object in the list. The object names had opposite gender in Spanish and German (half were masculine and half were feminine in each language), but the study was conducted entirely in English. Results showed that Spanish and German speakers generated adjectives that independent judges rated more masculine for items whose names were grammatically masculine (in their native language) than for items whose names were grammatically feminine. For example, the word for *key* is masculine in German and feminine in Spanish, whereas the word for *bridge* is feminine in German and masculine in Spanish. German speakers described keys as hard, heavy, and jagged, whereas Spanish speakers described them as little, lovely, and tiny. In contrast, German speakers described bridges as beautiful, elegant, and peaceful, whereas Spanish speakers said that they were big, strong, and towering. According to the authors, because the responses were given in English and were influenced by the grammatical gender of the native language, these findings point to the notion that conceptual information is shaped by gender, with some semantic features (i.e., the solidity in the case of referents of masculine nouns) becoming more salient or overrepresented.

Conflicting with this interpretation, in a recent study with native Spanish speakers, Degani (2007) found that pairs of nouns that matched in grammatical gender (e.g., *camisa* [*shirt*, feminine]–*mesa* [*table*, feminine]) did not elicit higher semantic similarity ratings compared with unmatched pairs. Furthermore, Kousta, Vinson, and Vigliocco (2008) argued that "Italian grammatical gender cannot logically have an effect on the nonlinguistic, conceptual representations of bilingual speakers" (p. 855). They used a continuous naming task, with pictures presented at a fast rate, and analyzed semantic substitution errors. They found that monolingual Italian speakers showed a significantly higher proportion of gender-preserving errors than did monolingual English speakers. Further, they showed that Italian–English bilingual speakers behaved like monolingual Italian speakers when the task was in Italian and like monolingual English speakers when the task was in English. According to the authors these results demonstrate that "grammatical gender increases semantic similarity between words that share the same gender in comparison to those that do not" (Kousta et al., 2008, p. 851).

All together, these studies confirm the linguistic notion that grammatical gender and meaning are intimately related. However, available empirical evidence is still weak, far from conclusive, and open to different interpretations. First, the studies quoted above focused on different aspects of meaning. Those of the first two groups examined the *connotative* meaning (which varies across individual speakers and can reflect personal experiences and feelings) and used tasks that may have induced participants to use, sometimes consciously, linguistic categories to describe concepts, or to associate linguistic properties to physical objects. In contrast, the studies of the third set investigated the *denotative* meaning (which is assumed to be shared by all speakers of a specific language), but the empirical data are contradictory.

Second, the previous studies assumed different functional loci for the effect of grammatical gender on meaning. The studies of the first two groups investigated whether language can change the way the objects are perceived and categorized, thus leading to stable conceptual representations that incorporate grammatical gender and related stereotypes, whereas the studies of the third group aimed to ascertain whether the actual processing of semantic information associated with the objects' names is influenced by arbitrary lexical properties such as grammatical gender. Therefore, following Vigliocco et al. (2008), who distinguished between *conceptual* and *lexical–semantic* representations, the gender effect may be located either at the level of prelinguistic knowledge or at the lexical level that provides access to semantic and syntactic information.

Conceptual knowledge is usually described as being organized in a domain-specific manner and involved in object recognition and use (see Mahon & Caramazza, 2003, for a discussion). In contrast, linguistic semantics "involves how the vocabulary and grammar of different languages map onto the *same* level of conceptual structure, thereby creating different natural groupings of meanings for users of different languages" (Jackendoff, 2002, p. 292). According to this distinction, the effect of gender on meaning might arise in processing language-independent concepts, even when neither verbal stimuli nor verbal responses are involved (as assumed by Boroditsky et al., 2003); alternatively, it might occur within the language system at the level of lexical representation (as proposed by Kousta et al., 2008).

In order to try to overcome some of the methodological limitations affecting the studies in this area, we exploited the early and mandatory access to grammatical gender information in picture naming (Cubelli, Lotto, Paolieri, Girelli, & Job, 2005). Using the picture–word interference task, whereby participants are required to name a picture while ignoring a distracter word printed on it, Cubelli et al. (2005) found that bare noun production times were slower when target and distracter nouns shared the same grammatical gender than when they had different genders. Such an interference effect of grammatical gender suggests that grammatical gender information is selected whenever a noun has to be produced outside a sentential context. Cubelli et al. proposed that at the lexical level, meaning and syntactic properties of a given noun are specified within the same representation. This being the

case, the selection of any lexical entry implies that grammatical gender is always accessed and can affect how a given noun's meaning is processed.

In this study, we investigated the influence of grammatical gender on category membership judgments. At variance with previous studies, this more stringent task (to judge whether two objects belong or not to the same category) does not require either subjective ratings or reference to the male–female distinction. If gender influences meaning processing, then the gender of objects' nouns should affect object categorization. Such a result should be definitive evidence supporting the hypothesis that the interaction between meaning and grammatical gender that has been described at the linguistic level can lead to measurable effects in psycholinguistic investigation. Different predictions can be put forward depending on where the grammatical gender effect comes from.

If grammatical gender shapes conceptual, nonlinguistic representation, then when participants are asked to judge objects with names with the same grammatical gender, reaction times should be faster in responding "yes" to object pairs belonging to the same category but slower in responding "no" to object pairs belonging to different categories.

The increased semantic similarity due to the shared grammatical gender is expected to facilitate the "yes" responses but to slow down rejections. Indeed, concepts not belonging to the same category are assumed to be more similar when they share grammatical gender rather than when they have different grammatical gender. If, on the contrary, grammatical gender affects performance at the lexical level (i.e., the *lemma* level described by Levelt, 1989), then both "yes" and "no" responses should be faster in gender congruent conditions than in gender incongruent ones. Indeed, the more similar the lexical representations are, the more they activate each other, thus leading to faster processing and comparison, independently of the response type (see Cubelli et al., 2005).

Further, if the effect is conceptual in nature, it should persist even when lexical processing is prevented (for instance, when concurrent articulatory suppression is required); in contrast, if the effect originates at the lexical level, it should disappear under articulatory suppression. According to Brandimonte and Gerbino (1993), articulatory suppression suppresses not only subvocal articulation but also the generation of the name of a visually presented object. That articulatory suppression prevents naming is still disputed. However, as Logie (1995) argued, articulatory suppression may "discourage the use of object names when attempting to retain information about a visually presented stimulus"; that is, it may encourage participants to "adopt a strategy that is not based on naming" (p. 40).

Grammatical gender is expected to influence semantic judgments: In the former, the effect should be due to the structure of the conceptual representation that has incorporated grammatical gender as a distinctive property; in the latter, the effect should reflect the high level of activation of grammatical gender, which speeds up the processing of lexical–semantic information. The categorization judgment task therefore appears to be suitable to investigate the presumed effect of gender on meaning and to disentangle whether it is conceptual or linguistic in nature (for a discussion, see Kousta et al., 2008).

Experiment 1

To study the effect of grammatical gender on semantic processing we used a category decision task. If gender and meaning are related, judging whether two objects belong to the same category should be affected by the congruency of grammatical gender. Monolingual Italian speakers and English speakers participated in the experiment.

English is a language with no grammatical gender system: According to Namai (2000), gender is a semantic notion in English. Therefore, the effect of grammatical gender was expected only with Italian participants, with English speakers acting as the control group. Yet Harrison (2006) observed that, though lacking grammatical gender, English "does allow some gender agreement with nonbiologically-determined nouns" (p. 41): For example, some machines (e.g., *ship*) may take feminine agreement. Boroditsky and Schmidt (2000) found that English speakers' intuitions about the gender of animals corresponded well with the grammatical gender assigned to those animals by both Spanish and German speakers. According to the authors, the grammatical genders assigned to some objects are not entirely arbitrary but reflect people's perception of the particular items as having stereotypically masculine or feminine properties. If this claim is correct, a gender effect should also be present in English. This being the case, this result should be interpreted as reflecting intrinsic dimensions of the conceptual, preverbal representation of objects rather than as a genuine consequence of the grammatical properties of nouns, either conceptual or lexical.

Method

Participants. Thirty-two native Italian-speaking students at the University of Padova (12 men, 20 women; mean age = 26.03 years, range: 21–33 years) and 32 native English-speaking students at the University of Edinburgh (13 men, 19 women; mean age = 21.81 years, range: 18–38 years) voluntarily participated in the experiment; they all had normal or corrected-to-normal vision.

Materials. From Lotto, Dell'Acqua, and Job's (2001) picture set, a group of 16 pictures was chosen from eight semantic categories: mammals, birds, vegetables, buildings, furniture, clothing, instruments, and vehicles. Half of the pictures had an Italian name of feminine gender, and the other half had one of masculine gender. Each picture belonging to this set was paired with four stimuli: two pictures from the same semantic category (related conditions) and two pictures from different semantic categories (unrelated conditions). In each condition, half of the pair was congruent for gender and the other half was incongruent (see Appendix A for the list of stimuli). Participants were presented with a total of 64 experimental pairs and 64 filler pairs, which were composed via the same criteria as the experimental pairs. The degree of semantic relatedness and visual similarity within each pair was evaluated separately by 40 Italian participants, on two 7-point scales (1 = *semantically unrelated, visually dissimilar*; 7 = *semantically related, visually similar*). On the basis of these ratings, we selected semantically related and unrelated pairs (Ms = 5.39 vs. 1.61, respectively), $t(62) = 25.19$, $p < .001$, that did not differ on visual similarity (Ms = 2.05 vs. 1.72, in the related and unrelated conditions, respectively), $t(62) = 1.95$, *ns*. In the semantically related condition, the gender congruent and incongruent

pairs were equated for semantic relatedness (*M*s = 5.47 vs. 5.31), $t(30) = 0.63$, *ns*, and visual similarity (*M*s = 2.05 vs. 2.05), $t(30) = 0.012$, *ns*; in the semantically unrelated condition semantic similarity (*M*s = 1.56 vs. 1.65), $t(30) = 0.53$, *ns*, and visual similarity (*M*s = 1.73 vs. 1.70), $t(30) = 0.18$, *ns*, were also equated.

The Italian names of the experimental pairs were matched for a number of variables, that is, length, frequency, familiarity, typicality, name agreement, age of acquisition (Lotto et al., 2001), and phonological overlap between the pairs. Further, all stimuli had phonologically transparent inflection, with feminine nouns ending with the vowel *–a* and masculine nouns ending with *–o*.

Procedure. The participants were tested individually, and they were asked to judge whether the two pictures belonged to the same semantic category or to different semantic categories by pressing the "yes" key or the "no" key, respectively. Participants were informed of the stimulus categories in the instructions. Hand–response mappings were counterbalanced across participants. The experiment started with a series of eight practice items. The stimuli were presented in four blocks. Four different lists were created from the combination of the four blocks, as in a Latin square design. In each block, semantically related and unrelated pairs, as well as gender congruent and incongruent pairs, were evenly distributed. Items were presented in a pseudorandomized order subjected to the following constraints: (a) The first three trials were fillers; (b) either congruent or incongruent pairs and related or unrelated pairs could appear in no more than three consecutive trials; and (c) items belonging to the same semantic category could not appear in consecutive trials. The stimuli were presented side by side in black on a white background using E-Prime 1.1 (Psychology Software Tools, Pittsburgh, PA). When projected on the screen, pictures could be included in an ideal square of about 5 × 5 cm. A trial consisted of the following events: a fixation cross at the center of the screen for 500 ms; the two pictures until the response, or for a maximum of 4,000 ms; and a blank interval for 500 ms. Response speed and accuracy were both emphasized. Each testing session consisted of 128 trials and lasted approximately 20 min.

Results

Two types of responses were excluded from the analyses: (a) categorization errors and (b) correct responses produced after 2,500 ms. The effects of very long or very short latencies were reduced by establishing a cutoff point equal to ±2.0 *SD* from a participant's mean and replacing outlying data with those values. For the Italian participants, 9.2% of the overall responses were excluded from the analysis (8.7% categorization errors); 4.7% of the data were outlying values replaced with the cutoff. For the English participants, 11.3% of the overall responses were excluded from the analysis (10.7% categorization errors); 3.4% of the data were outlying values replaced with the cutoff. Average reaction times were submitted to analyses of variance (ANOVAs).

An analysis with language as a between-subjects factor and semantic relatedness and gender congruity as within-subject factors was performed. The results showed a significant effect of semantic relatedness, $F_1(1, 62) = 72.02$, $p = .0001$; $F_2(1, 30) = 9.61$, $p = .004$, with semantically related pairs being faster than semantically unrelated pairs (809 vs. 900 ms). The interaction between gender congruity and language reached significance in the analysis by subjects, $F_1(1, 62) = 6.68$, $p = .01$; $F_2(1, 30) = 0.22$, $p = .64$. Planned comparisons revealed that the gender congruity effect was found with Italian speakers, $F_1(1, 62) = 8.78$, $p = .004$; $F_2(1, 30) = 1.84$, $p = .18$, but not with English speakers, $F_1(1, 62) = 0.48$, $p = .50$; $F_2(1, 30) = 0.47$, $p = .49$.

Two separate ANOVAs were also performed for each language. Results are reported in Table 1.

Italian. The analysis showed a significant main effect of semantic relatedness, $F_1(1, 31) = 39.04$, $p = .0001$; $F_2(1, 15) = 6.39$, $p = .023$, reflecting that responses to semantically related pairs (793 ms) were faster than those to unrelated pairs (898 ms). In addition, the main effect of gender congruity reached significance in the analysis by subjects, $F_1(1, 31) = 8.34$, $p = .006$; $F_2(1, 15) = 1.92$, $p = .185$, indicating that responses to gender congruent pairs (833 ms) were faster than those to incongruent pairs (858 ms). The interaction was not significant (*F*s < 1).

A further statistical analysis was performed excluding the pairs composing the stimulus *gallina* (*hen*), because it is a derived noun with the feminine derivational suffix *–ina*. The pattern of results did not vary: The main effects of semantic relatedness, $F_1(1, 31) = 36.56$, $p = .0001$; $F_2(1, 14) = 4.94$, $p = .043$, and gender congruity in the analysis by subjects, $F_1(1, 31) = 5.40$, $p = .027$; $F_2(1, 14) = 1.16$, $p = .30$, were significant, but not their interaction (*F*s < 1).

The error analyses showed the effect of semantic relatedness in the analysis by subjects, $F_1(1, 31) = 6.20$, $p = .003$; $F_2(1, 15) = 2.12$, $p = .16$. Neither the main effect of gender congruity, $F_1(1, 31) = 2.02$, $p = .16$; $F_2(1, 15) = 0.18$, $p = .68$, nor the interaction was significant (*F*s < 1).

English. Only a significant effect of semantic relatedness was found, $F_1(1, 31) = 32.99$, $p = .0001$; $F_2(1, 1) = 3.72$, $p = .072$, with responses to semantically related pairs (809 ms) being faster than those to unrelated pairs (899 ms). Neither gender congruity, $F_1(1, 31) = 0.47$, $p = .495$; $F_2(1, 15) = 0.25$, $p = .62$, nor the interaction, $F_1(1, 31) = 1.62$, $p = .214$; $F_2(1, 15) = 0.15$, $p = .70$, was significant. Results are reported in Table 3. The error analyses showed no significant effects (all *F*s < 1).

Discussion

In a category decision task with pictures, Italian speakers showed both a semantic effect and an effect of grammatical

Table 1
Experiment 1: Mean (SD) Categorization Latencies (in Milliseconds) for Italian and English Speakers

Variable	Gender		Difference
	Congruent	Incongruent	
Italian speakers			
Semantically related	781 (136)	805 (168)	−26
Semantically unrelated	885 (160)	910 (171)	−25
Difference	−104	−105	
English speakers			
Semantically related	813 (142)	806 (130)	+7
Semantically unrelated	891 (173)	908 (171)	−17
Difference	−78	−102	

gender. Even when irrelevant to the task and not explicitly mentioned in the instructions, the congruity of the grammatical gender of the names of the pictures speeded up responses to both semantically related pairs ("yes" responses) and semantically unrelated pairs ("no" responses). On the contrary, with English-speaking participants only a semantic effect was found, and no influence of the grammatical gender of Italian names was observed on judgment times. These findings strongly suggest that grammatical gender also does affect semantic processing in tasks requiring categorical judgments of pictures (Vigliocco et al., 2005; see also Bowers, Vigliocco, Stadthagen-Gonzalez, & Vinson, 1999). Further, they are consistent with the lexical hypothesis, according to which grammatical gender does not modify the conceptual representation of the objects but facilitates the processing of the meaning of the gender congruent noun pairs (Kousta et al., 2008).

However, it is possible that the results of Experiment 1 reflected either uncontrolled biases in the material selection or idiosyncratic preferences for some objects in the Italian-speaking group. Thus, to obtain clear evidence of the effect of grammatical gender on picture categorization, we explored the possibility of a differential effect of grammatical gender in two gendered languages. The second study aimed to investigate whether the same pictures elicit opposite effects of gender in Italian and Spanish, using picture pairs chosen in such a way that the grammatical gender of the names was opposite in the two languages.

Experiment 2

In this experiment we tried to replicate the effect of grammatical gender on object categorization by presenting a new set of pictures to Italian and Spanish monolingual speakers. The objects' names were selected to constitute stimulus pairs that were congruent for gender in one language (e.g., Italian) but incongruent in the other (e.g., Spanish) and vice versa. A grammatical gender congruity effect was expected in both languages, but this effect should vary depending on the gender of the names in each language, even if participants are presented with the same pictures.

Method

Participants. Thirty-two native Italian-speaking students at the University of Padova (10 men, 22 women; mean age = 25.75 years, range: 20–34 years) and 32 native Spanish-speaking students at the University of Jaen (six men, 26 women; mean age = 25.55 years, range: 18–38 years) voluntarily participated in the experiment; they all had normal or corrected-to-normal vision.

Materials. We selected 70 pictures from the Lotto et al. (2001) and Snodgrass and Vanderwart (1980) sets, half with names of feminine gender and half with names of masculine gender. For a group of 56 pictures the grammatical gender was the same in Italian and in Spanish. For example, in both languages *eye* is masculine (*occhio* in Italian and *ojo* in Spanish) and *mouth* is feminine (*bocca* in Italian and *boca* in Spanish). The other group of 14 pictures (selected from seven semantic categories: furniture, mammals, kitchen utensils, clothing, body parts, containers, and tools) was chosen in such a way that the grammatical gender of the names was opposite in the two languages. For example, *nose* is masculine in Italian (*naso*) and feminine in Spanish (*nariz*). Each picture belonging to this latter set was paired with a picture that came from the first group of pictures. In this way, we obtained pairs of stimuli that were gender congruent in one language and gender incongruent in the other (e.g., the picture pair *nose–eye* is gender congruent in Italian [*naso–occhio*] and gender incongruent in Spanish [*nariz–ojo*]). Half of the 56 pairs so constructed contained pictures belonging to the same semantic category, and the other half of the pictures belonged to different categories. Each condition comprised 14 pairs of pictures; half of the picture names were congruent for gender and the other half were incongruent. The resulting design is shown in Figure 1. The complete list of stimuli is reported in Appendix B.

In addition to the 56 experimental pairs, participants were presented with 56 filler pairs composed via the same criteria used for the experimental pairs.

Procedure. The procedure was the same as in Experiment 1. Again, participants were asked to judge whether the two stimuli belonged to the same semantic category or to different semantic categories by pressing that "yes" key or the "no" key, respectively. They were informed of the stimulus categories in the instructions. Each testing session consisted of 112 trials. Given that the selection of the material was very strict, we could not control stringently for name agreement. Therefore, to assure that each picture elicited the expected name (and the expected grammatical gender), each participant was asked to name the entire set of stimuli at the end of the experimental session. The session lasted for approximately 25 min. The experiment started with a series of eight practice items.

Results and Discussion

The data were treated in the same way as in Experiment 1. In addition, the trials for which there was a mismatch between the expected name and the name provided at the end of the experi-

Picture 1		Picture 2			
		Related Congruent Italian Incongruent Spanish	Related Incongruent Italian Congruent Spanish	Unrelated Congruent Italian Incongruent Spanish	Unrelated Incongruent Italian Congruent Spanish
					
Italian	*NASO (masc.)*	*OCCHIO (masc.)*	*BOCCA (fem.)*	*SEDANO (masc.)*	*PANNOCCHIA (fem.)*
Spanish	*NARIZ (fem.)*	*OJO (masc.)*	*BOCA (fem.)*	*APIO (masc.)*	*MAZORCA (fem.)*

Figure 1. Examples of the experimental items used in Experiment 2. Masc. = masculine grammatical gender; fem. = feminine grammatical gender.

mental session were discarded. For the Italian participants, 25.3% of the overall responses were excluded from the analysis (8.7% categorization errors; 16.6% production of wrong names in the control naming task); 4.7% of the data were outlying values replaced with the cutoff. For the Spanish participants, 18.9% of the overall responses were excluded from the analysis (5.5% categorization errors; 13.4% production of wrong names); 3.9% of the data were outlying values replaced with the cutoff. The high number of wrong responses in both languages involved stimuli with low name agreement.

An analysis with language as a between-subjects factor and semantic relatedness and gender congruity as within-subject factors was performed. It is important to note that the gender congruent pairs in Italian were incongruent in Spanish and vice versa. The results showed a significant effect of semantic relatedness, $F_1(1, 62) = 78.55$, $p = .00001$; $F_2(1, 26) = 17.77$, $p = .0003$, with semantically related pairs being faster than semantically unrelated pairs (826 vs. 918 ms). More important, the interaction between gender congruity and language was significant, $F_1(1, 62) = 38.715$, $p = .0001$; $F_2(1, 26) = 3.91$, $p = .05$. The planned comparison analyses revealed that the congruent condition was faster than the incongruent condition in both languages: Italian, $F_1(1, 62) = 31.06$, $p = .0001$; $F_2(1, 26) = 3.49$, $p = .073$; Spanish, $F_1(1, 62) = 9.99$, $p = .002$; $F_2(1, 26) = 0.86$, $p = .36$.

Although participants were presented with the same pictures, participants' responses depended on the congruency of the pictures' names, which was opposite in the two languages.

Two separate analyses of variance (ANOVAs) were also performed for each language. Results are reported in Table 2.

Italian. The analysis showed a significant main effect of semantic relatedness, $F_1(1, 31) = 40.20$, $p = .0001$; $F_2(1, 13) = 8.02$, $p = .01$, indicating that responses to semantically related pairs (812 ms) were faster than those to unrelated pairs (941 ms). Also, the main effect of gender congruity was significant in the analysis by subjects, $F_1(1, 31) = 35.55$, $p = .0001$; $F_2(1, 13) = 1.41$, $p = .25$, indicating that responses to gender congruent pairs (855 ms) were faster than those to incongruent pairs (898 ms). The interaction was not significant, $F_1(1, 31) = 2.62$, $p = .11$; $F_2(1, 13) = 0.13$, $p = .72$. The error analyses showed no significant effects (all Fs < 1).

Spanish. The main effect of semantic relatedness was significant, $F_1(1, 31) = 38.797$, $p = .0001$; $F_2(1, 13) = 9.97$, $p = .007$, with responses to semantically related pairs (793 ms) faster than those to unrelated pairs (898 ms). The main effect of gender congruity was also significant in the analysis by subjects, $F_1(1, 31) = 8.88$, $p = .005$; $F_2(1, 13) = 2.51$, $p = .14$, with responses to gender congruent pairs (833 ms) faster than those to incongruent pairs (858 ms). The interaction was not significant (Fs < 1). The error analyses showed no significant effects (all Fs < 1).

Table 2
Experiment 2: Mean (SD) Categorization Latencies (in Milliseconds) for Italian and Spanish Speakers

Variable	Gender		Difference
	Congruent	Incongruent	
Italian speakers			
Semantically related	780 (141)	844 (150)	−64
Semantically unrelated	930 (206)	953 (215)	−23
Difference	−150	−109	
Spanish speakers			
Semantically related	781 (136)	805 (168)	−24
Semantically unrelated	885 (160)	910 (171)	−25
Difference	−104	−105	

To strengthen our results, we performed an ANOVA by items, considering both experiments, thus providing us with a larger number of data points. In the combined analysis for Experiments 1 and 2 we included the data from the Italian participants of Experiments 1 and 2 and the Spanish participants of Experiment 2. The data of the English participants of Experiment 1 were not included, because no gender congruency effect in English was predicted.

The results showed a significant effect of semantic relatedness, $F_2(1, 43) = 25.63$, $p = .0001$, and a significant effect of gender congruity, $F_2(1, 43) = 4.81$, $p = .033$. Naming latencies to semantically related pairs (820 ms) were faster than those to unrelated pairs (913 ms), and responses to gender congruent pairs (849 ms) were faster than those to incongruent pairs (883 ms).

The results of Experiment 2 confirm the role of grammatical gender in object categorization. Previous evidence has shown that pictures may activate the phonological forms of their names automatically (see e.g., Morsella & Miozzo, 2002). For the first time the present findings suggest that grammatical gender is also automatically activated. Even if the retrieval of the name is not required to accomplish the task, grammatical information of the objects' names appeared to be consulted or, at least, available. However, it is possible that in a categorical judgment task lexical access is not obligatory. Indeed, speakers in "tip of the tongue" states do not have any trouble in accessing word meaning (Caramazza & Miozzo, 1997). To test directly whether the effect of grammatical gender in normal circumstances reflects the access to lexical information, in the next experiment we asked participants to perform a secondary task that prevented articulation. If the categorization task may be accomplished without access to lexical information, under articulatory suppression the gender effect should disappear.

Experiment 3

In this experiment, we examined the involvement of the lexical system in the category decision task. Participants performed a secondary task preventing articulation (an articulatory suppression task). If the effect is mediated by lexical retrieval, although activation of lexical–semantic representations is not required, the gender effect should persist, but no difference between gender congruent and incongruent conditions should be observed.

Method

Participants. Sixteen native Spanish-speaking students at the University of Granada (four men, 12 women; mean age = 21.5 years, range: 20–27 years) voluntarily participated in the experiment; they all had normal or corrected-to-normal vision.

Materials and procedure. The same materials, procedure, and analyses as in Experiment 2 were used. Participants were instructed to judge whether two pictures belonged to the same semantic category or to different semantic categories by pressing

the "yes" key or the "no" key, respectively. They were also asked to continuously repeat "bla, bla, bla" while performing the task.

Results and Discussion

The data were treated in the same way as in the previous experiments: 20.5% of the overall responses were excluded from the analysis (9.4% categorization errors; 11.13% production of wrong names); 4.1% of the data were outlying values replaced with the cutoff.

An analysis with semantic relatedness and gender congruity as within-subject factors was performed. The results showed a significant effect of semantic relatedness in the analysis by subjects, $F_1(1, 15) = 9.71$, $p = .007$; $F_2(1, 13) = 2.49$, $p = .138$, with semantically related pairs being faster than semantically unrelated pairs (803 vs. 900 ms). Neither gender congruity nor the interaction was significant (Fs < 1). Results are reported in Table 3. The error analyses showed no significant effects (all Fs < 1).

Consistent with our prediction, the grammatical gender effect, but not the semantic effect, disappeared in the articulatory suppression condition. It follows that grammatical gender does not alter conceptual representation; rather the grammatical gender effect in categorization judgments reflects that semantic and syntactic lexical representation are accessed spontaneously in accomplishing the task.

General Discussion

The present study showed that the categorization time of pictures is modulated by grammatical gender: When the two objects to be classified as belonging or not to the same category had names that shared a grammatical gender, responses were faster than when the grammatical genders of the two names were different.[1] The effect is consistent, and it is language specific: It has been shown by speakers of languages that do possess grammatical gender (namely, by Italian speakers, in two experiments with different materials, and by Spanish speakers). The absence of the effect in English, coupled with the modulation of the effect in Italian and Spanish as a function of the gender of individual items, rules out the possibility that uncontrolled semantic properties are responsible for the present results.

Two possible loci for the influence of grammatical gender on picture categorization can be posited: the conceptual level or the linguistic level. According to the first hypothesis, the results show systematic, fast, and unconscious effects of an arbitrary linguistic feature on conceptual processing, and so they are relevant for the hypothesis of *linguistic relativity* (Sapir, 1921; Whorf, 1956; see Gentner & Goldin-Meadow, 2003). The claim for a role of language in thinking is controversial (see Gennari, Sloman, Malt, & Fitch, 2002; Papafragou, Massey, & Gleitman, 2002; Pinker, 1994; Rosch, 1973; Slobin, 1996), but it is assumed to be valuable (see Hunt & Agnoli, 1991, for a discussion), and it is supported by evidence in several domains, including colors (Roberson, 2005), spatial relations (Bowerman & Choi, 2001; Levinson, 1996), and time (Boroditsky, 2001; but see January & Kako, 2007).

Within this framework, Konishi (1993) and Tasmowski-De Ryck and Verluyten (1982) proposed that arbitrary syntactic features such as the grammatical gender of words become part of the conceptual representation of the objects they refer to during the course of language learning, thus influencing the way the objects are thought of (see Sera et al., 2002, for a discussion). It follows that the conceptual representation of objects is different in speakers of different languages. Two objects belonging to the same category and having names with the same grammatical gender should be conceptually more similar than two objects belonging to the same category but having names with different grammatical gender. When required to judge whether two objects belong to the same category, as required in the categorization judgment task, the greatest amount of shared information leads to an advantage for gender congruent pairs. This is what we found in the present study. However, if our results reflect differences at the level of conceptual representation, an interference effect of grammatical gender should have been observed in the case of semantically unrelated pairs. Indeed, by the same principle, to press "no" in response to objects belonging to different categories should be faster in the case of gender incongruent pairs compared with gender congruent pairs, as stimuli with different gender are conceptually more dissimilar than objects sharing the same grammatical gender. Therefore, according to this perspective, we should have found an interaction between category and gender congruency, with an advantage of the congruent pairs in the semantically related condition and an advantage of the incongruent pairs in the semantically unrelated condition. In contrast with this prediction, we found a main effect of gender congruency, with responses to gender congruent pairs always being faster than those to gender incongruent pairs, even in the semantically unrelated condition.

According to us, the present findings can be accounted for by assuming that the gender effect is located at the lexical level and that to accomplish the task the lexical representations associated with the stimulus objects are accessed. In other words, after the objects have been recognized and identified, their names become immediately available and are used to accomplish the task. Thus, when asked to categorize objects, we assume that participants name the stimuli, even if subvocally. In a categorization task, nouns sharing the same grammatical gender activate each other, thus facilitating their processing and speeding up manual re-

Table 3
Experiment 3: Mean (SD) Categorization Latencies (in Milliseconds) for Spanish Speakers While Performing the Articulatory Suppression Task

	Gender		
Variable	Congruent	Incongruent	Difference
Spanish speakers			
Semantically related	812 (136)	794 (129)	18
Semantically unrelated	906 (188)	894 (180)	12
Difference	−94	−100	

[1] One could claim that the gender effect in our study was due to the fact that same-gender items had the same gender marker endings. However, it is worth noting that in Italian the grammatical gender effect has been found in naming tasks independently from the transparency of the ending vowels of the target nouns, both in the picture–word paradigm (Paolieri, Cubelli, et al., 2010) and in L2 naming and word translation (Paolieri, Lotto, et al., 2010).

sponses either to semantically related or semantically unrelated pairs. In sum, our findings seem to indicate that object categorization is a language-mediated task and that the effect of grammatical gender on categorization is indirect: It occurs not because gender is an intrinsic part of conceptual representation, thus increasing the semantic similarity of the objects with congruent names, but because object categorization requires the processing of lexical representation and depends on the level of activation of the objects' names. It follows that the more information names share, the more activated they are, and the more rapidly they are processed. According to this view, we are not obliged to postulate that language shapes the conceptual representations of objects. Rather, it is that language intervenes while the task is being performed (see also Presson & Sera, 2006). This interpretation can account for what we found in Experiment 1, whereby the results showed facilitative effects of gender on semantic processing in Italian speakers, but no inhibitory effects relative to the English speakers, and in Experiment 3, whereby the gender effect but not the semantic effect disappeared under articulatory suppression.

The functional relation between gender and semantics could be located at the abstract lemma level, as proposed by the double selection (DS) model (Cubelli et al., 2005). Following Levelt (1989), the DS model posits that at the phonology-independent lemma level, each word representation comprises two separate components specifying independent semantic and syntactic information. To produce a given noun, both meaning and grammatical properties have to be selected. In other words, access to the phonological form is achieved only when the selection at both components of the lemma level has been completed. Moreover, in all tasks requiring access to the lexical system, both semantic and gender information are always activated, even when no oral production is needed. If these two assumptions hold, the effects of grammatical gender observed in the present study can be ascribed to the lemma level, where both the meaning and the gender of a given noun are represented. Specifically, in the picture categorization task we used, when the stimulus pairs shared the same grammatical gender, the lemma representations of the names of the two objects activated each other, speeding up their processing—the more similar the lexical representations are at the syntactic level, the more the semantic processing is facilitated. Therefore, to accomplish the categorization of objects, the lexical representation of their names is exploited at least to the lemma level. The present findings represent further evidence that grammatical gender is automatically activated, irrespective of the task at hand, even if no overt speech is required.

Our results seem to be inconsistent with other models of language processing that postulate distinct levels of representation for semantic information and syntactic properties. The model WEAVER++ (Levelt et al., 1999) assumes that information associated with a given word is represented in three main layers. The top layer, which describes meaning by means of a network of conceptual connections, activates the intermediate layer (lemma), which is connected to nodes representing the word's syntactic properties, such as grammatical gender. The lemma, in turn, activates the third layer, which specifies the phonological form of the target word. An alternative model, proposed by Caramazza (1997) and Caramazza and Miozzo (1997) and called the independent network (IN) model, also distinguishes three separated networks representing lexical–semantic, syntactic, and phonological information. Yet, in this model, semantic representations can activate word forms directly, whereas syntactic features are preactivated by semantic information, but they are accessed only after the selection of the corresponding modality-specific lexical node.

Even if they differ for relevant assumptions, both the WEAVER++ and IN models postulate unidirectional connections between nouns and their syntactic properties, with one single node for each grammatical gender, and assume that grammatical gender is selected only when noun phrases have to be computed. Therefore, no gender effect is predicted when lexical information is selected and processed in isolation. Further, because both models include no feedback from syntactic properties to meaning representation, object categorization is assumed not to be influenced by grammatical gender. Our results showing a gender facilitation effect in category judgment tasks are problematic for both models. To account for this effect, they have to assume the existence of bidirectional connections between nouns and gender nodes, and between gender nodes and semantic representations, that allow lexical representation to feed back to meaning representation.

In conclusion, with the three experiments described in the present study we were able to demonstrate unquestionably that grammatical gender affects semantic processing. From a methodological point of view, the category decision task we used allowed us to rule out any possible confounding factors due to the procedure or the instructions: Responses did not require subjective judgments, and the purpose of the study remained covert throughout the experimental session. Our results also suggest that in tasks that seem not to involve the language system explicitly (see Boroditsky et al., 2003), a strong relationship between grammatical gender and meaning emerges. In our opinion, this provides evidence that semantic processing is influenced by the lexical–grammatical properties of each particular language. Cognitive processes are differently loaded when speakers of different languages are processing utterances (see, for instance, how the different cues on parsing in different languages imply a different involvement of working memory, as discussed by Hunt & Agnoli, 1991). Our findings also show that the speed of processing is differently modulated when speakers of different languages are engaged in categorization tasks.

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Appendix A

Experiment 1: Stimulus Material

Target 1		Target 2			
		Semantically related		Semantically unrelated	
Stimulus word	Stimulus gender	Gender congruent	Gender incongruent	Gender congruent	Gender incongruent
Letto (*bed*)	Masculine	*Sgabello* (*stool*)	*Lampada* (*lamp*)	*Binocolo* (*binoculars*)	*Zattera* (*raft*)
Carciofo (*artichoke*)	Masculine	*Sedano* (*celery*)	*Pannocchia* (*ear of corn*)	*Pennello* (*brush*)	*Caramella* (*candy*)
Canguro (*kangaroo*)	Masculine	*Orso* (*bear*)	*Zebra* (*zebra*)	*Rubinetto* (*faucet*)	*Pistola* (*gun*)
Castello (*castle*)	Masculine	*Faro* (*lighthouse*)	*Cupola* (*cupola*)	*Secchio* (*pail*)	*Tanica* (*jerry can*)
Guanto (*glove*)	Masculine	*Cappello* (*hat*)	*Cravatta* (*tie*)	*Rasoio* (*razor*)	*Tazza* (*cup*)
Pinguino (*penguin*)	Masculine	*Struzzo* (*ostrich*)	*Anatra* (*duck*)	*Mestolo* (*ladle*)	*Castagna* (*chestnut*)
Tamburo (*drum*)	Masculine	*Flauto* (*flute*)	*Arpa* (*harp*)	*Cucchiaio* (*spoon*)	*Amaca* (*hammock*)
Triciclo (*tricycle*)	Masculine	*Aereo* (*airplane*)	*Slitta* (*sledge*)	*Gallo* (*cock*)	*Ciliegia* (*cherry*)
Sedia (*chair*)	Feminine	*Scrivania* (*desk*)	*Cassetto* (*drawer*)	*Scatola* (*box*)	*Camino* (*chimney*)
Carota (*carrot*)	Feminine	*Zucca* (*pumpkin*)	*Fungo* (*mushroom*)	*Frusta* (*whip*)	*Birillo* (*bowling pin*)
Giraffa (*giraffe*)	Feminine	*Pecora* (*sheep*)	*Topo* (*mouse*)	*Bottiglia* (*bottle*)	*Arco* (*arch*)
Chiesa (*church*)	Feminine	*Scalinata* (*steps*)	*Pozzo* (*well*)	*Cicogna* (*stork*)	*Cigno* (*swan*)
Camicia (*shirt*)	Feminine	*Scarpa* (*shoe*)	*Calzino* (*sock*)	*Tenda* (*tent*)	*Sassofono* (*saxophone*)
Gallina (*hen*)	Feminine	*Aquila* (*eagle*)	*Pappagallo* (*parrot*)	*Fionda* (*sling*)	*Elicottero* (*helicopter*)
Tromba (*trumpet*)	Feminine	*Batteria* (*drums*)	*Organo* (*organ*)	*Bicicletta* (*bicycle*)	*Cancello* (*gate*)
Carrozza (*carriage*)	Feminine	*Gondola* (*gondola*)	*Treno* (*train*)	*Anguria* (*watermelon*)	*Coniglio* (*rabbit*)

(*Appendices continue*)

Appendix B

Experiment 2: Stimulus Material

			Target 2			
Target 1			Semantically related		Semantically unrelated	
Language	Stimulus word	Stimulus gender	Gender congruent	Gender incongruent	Gender congruent	Gender incongruent
Italian	*Letto* (*bed*)	Masculine	*Sgabello* (*stool*)	*Lampada* (*lamp*)	*Binocolo* (*binoculars*)	*Zattera* (*raft*)
Spanish	*Cama* (*bed*)	Feminine	*Lampara* (*lamp*)	*Taburete* (*stool*)	*Balsa* (*raft*)	*Prismatico* (*binoculars*)
Italian	*Coperchio* (*cover*)	Masculine	*Mestolo* (*ladle*)	*Padella* (*pan*)	*Faro* (*lighthouse*)	*Cupola* (*cupola*)
Spanish	*Tapadera* (*cover*)	Feminine	*Sarten* (*pan*)	*Cazo* (*ladle*)	*Cupula* (*cupola*)	*Faro* (*lighthouse*)
Italian	*Naso* (*nose*)	Masculine	*Occhio* (*eye*)	*Bocca* (*mouth*)	*Sedano* (*celery*)	*Pannocchia* (*ear of corn*)
Spanish	*Nariz* (*nose*)	Feminine	*Boca* (*mouth*)	*Ojo* (*eye*)	*Mazorca* (*ear of corn*)	*Apio* (*celery*)
Italian	*Scoiattolo* (*squirrel*)	Masculine	*Orso* (*bear*)	*Zebra* (*zebra*)	*Rubinetto* (*faucet*)	*Pistola* (*gun*)
Spanish	*Ardilla* (*squirrel*)	Feminine	*Zebra* (*zebra*)	*Oso* (*bear*)	*Pistola* (*gun*)	*Grifo* (*faucet*)
Italian	*Sandalo* (*sandal*)	Masculine	*Cappello* (*hat*)	*Cravatta* (*tie*)	*Treno* (*train*)	*Giraffa* (*giraffe*)
Spanish	*Sandalia* (*sandal*)	Feminine	*Corbata* (*tie*)	*Sombrero* (*hat*)	*Jirafa* (*giraffe*)	*Tren* (*train*)
Italian	*Bullone* (*bolt*)	Masculine	*Trapano* (*drill*)	*Pinza* (*pliers*)	*Pomodoro* (*tomato*)	*Carota* (*carrot*)
Spanish	*Tuerca* (*bolt*)	Feminine	*Pinza* (*pliers*)	*Taladro* (*drill*)	*Zanahoria* (*carrot*)	*Tomate* (*tomato*)
Italian	*Barattolo* (*tin*)	Masculine	*Bicchiere* (*glass*)	*Bottiglia* (*bottle*)	*Cigno* (*swan*)	*Scalinata* (*steps*)
Spanish	*Lata* (*tin*)	Feminine	*Botella* (*bottle*)	*Vaso* (*glass*)	*Escalera* (*steps*)	*Cisne* (*swan*)
Italian	*Scrivania* (*desk*)	Feminine	*Sedia* (*chair*)	*Cassetto* (*drawer*)	*Scatola* (*box*)	*Pennello* (*brush*)
Spanish	*Escritorio* (*desk*)	Masculine	*Cajon* (*drawer*)	*Silla* (*chair*)	*Cepillo* (*brush*)	*Caja* (*box*)
Italian	*Forchetta* (*fork*)	Feminine	*Pentola* (*pot*)	*Coltello* (*knife*)	*Tanica* (*jerry can*)	*Canguro* (*kangaroo*)
Spanish	*Tenedor* (*fork*)	Masculine	*Cuchillo* (*knife*)	*Olla* (*pot*)	*Canguro* (*kangaroo*)	*Garrafa* (*jerry can*)
Italian	*Spalla* (*shoulder*)	Feminine	*Gamba* (*leg*)	*Braccio* (*arm*)	*Cicogna* (*stork*)	*Gallo* (*cock*)
Spanish	*Hombro* (*shoulder*)	Masculine	*Brazo* (*arm*)	*Pierna* (*leg*)	*Gallo* (*cock*)	*Ciguena* (*stork*)
Italian	*Tigre* (*tiger*)	Feminine	*Pecora* (*sheep*)	*Coniglio* (*rabbit*)	*Anguria* (*watermelon*)	*Arco* (*arch*)
Spanish	*Tigre* (*tiger*)	Masculine	*Conejo* (*rabbit*)	*Obeja* (*sheep*)	*Arco* (*arch*)	*Sandia* (*watermelon*)
Italian	*Scarpa* (*shoe*)	Feminine	*Camicia* (*shirt*)	*Calzino* (*sock*)	*Tenda* (*tent*)	*Sassofono* (*saxophone*)
Spanish	*Zapato* (*shoe*)	Masculine	*Calzetin* (*sock*)	*Camisa* (*shirt*)	*Saxofon* (*saxophone*)	*Tienda* (*tent*)
Italian	*Vite* (*screw*)	Feminine	*Sega* (*saw*)	*Martello* (*hammer*)	*Chiesa* (*church*)	*Birillo* (*bowling pin*)
Spanish	*Tornillo* (*screw*)	Masculine	*Martillo* (*hammer*)	*Sierra* (*saw*)	*Bolo* (*bowling pin*)	*Iglesia* (*church*)
Italian	*Botte* (*barrel*)	Feminine	*Tazza* (*cup*)	*Secchio* (*pail*)	*Zucca* (*pumpkin*)	*Castello* (*castle*)
Spanish	*Barril* (*barrel*)	Masculine	*Cubo* (*pail*)	*Taza* (*cup*)	*Castello* (*castle*)	*Calabaza* (*pumpkin*)

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