How a Language Gender System Creeps into Perception

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The influence of a gender system in a language on perception was examined in a cross-cultural study. Participants were from two language groups, one with a gender system, Spanish, and the other with a limited gender system, English. In each language group, participants were from three age groups: 5-7 years old, 8-10 years old, and adult. In one experiment, participants were asked to put a typical male or female name to 20 objects. In another experiment, participants were asked to assign attributes to the objects. Language gender tags influenced the Spanish adults and the 8- to 10-year-olds in their choice of gender assignment, whereas perceived attributes influenced the younger Spanish children and English speakers (both adults and children). It appears that in a language with a grammatical gender system, such as Spanish, the gender system creeps into perception *after* the gender tags have been acquired.

HOW A LANGUAGE GENDER SYSTEM CREEPS INTO PERCEPTION

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The relationship between language and thought has been a major issue of concern in psychology since Sapir (1970) and Whorf and Carroll (1956) advanced their hypothesis that language determines, or at least influences, the way we look at our world. Although a range of studies has challenged the validity of both linguistic determinism and linguistic relativism on empirical and theoretical grounds (Au, 1983, 1992; Brown, 1976; Brown & Lenneberg, 1954), recent reconceptualizations of the language-thought relationship that emphasize sociocultural context of language and culture acquisition suggest an interactional relationship between them (Gumperz & Levinson, 1991; Hardin & Banaji, 1993; Hill & Mannheim, 1992; Hunt & Agnoli, 1991; Lucy, 1992).

Language shapes our higher-order cognitive processes. In some Indo-European languages (e.g., Spanish), personal pronouns are not obligatory, partly because the referents can be recovered from the verb inflections (Corbett, 1991). In languages such as Chinese and Japanese, pronouns can be omitted despite the absence of verb inflections and the grammatical rule of subject-verb agreement (Hinds, 1982; Li & Thompson, 1976).

In a similar vein, some languages, such as German, Italian, and French, have a gender system where the definite article (e.g., *le* or *la* in French) depends on the noun's grammatical gender. In a comparative study of speakers of Arabic and English by Clarke, Losoff, McCracken, and Still (1981), participants were asked to evaluate objects along a masculine-feminine scale; comparison of the responses of the two groups suggests that the gender of the nouns in Arabic affected the response of the Arabic speakers. Thus, nouns such as *necklace* and *perfume*, whose equivalents are masculine in Arabic, received a higher masculine rating from Arabic than from English speakers. Similar correlations of gender and abstract nouns in German were established by Zubin and Kopcke (1984) in an experiment using a semantic differential technique.

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In psycholinguistic models of speech production, it is assumed that lexical access (the retrieval of a word) occurs in two steps. In the first step, an abstract word representation (called "lemma" by Kempen & Huijbers, 1983) is retrieved, and this allows access to the word's syntactic properties. In the second step, the phonological form is accessed. Gender information (neutral, feminine, or masculine) is assumed to be retrieved in the first step. Activation of this gender node leads to the activation of agreement targets for that gender, including the definite article. Heij, Mak, Sander, and Willeboordse (1998) found that in a picture-word task in Dutch, gender information is activated upon presentation of a word, regardless of whether syntactic information is necessary. For example, the word *boek* is activated as neuter even when the noun is produced alone as opposed to a noun phrase such as "*het boek*," where the definite article depends on the noun's grammatical gender, and knowledge of the gender is necessary. Considering the fact that gender information is accessed almost automatically, prior to syntactic and phonological information, it would appear that its influence on conceptual representation is paramount in gender system languages.

When does a child acquire gender system information? From research on German (Maratsos & Chalkley, 1980), Spanish (Clark, 1986), and French (Tucker, Lambert, & Rigault, 1977), it seems that formal rules are learned before the natural gender rule. Karmiloff-Smith (1979) conducted detailed experiments with gender assignment in French nouns, using experimental situations in which there was a conflict between the natural gender of the referent (e.g., an obviously female Martian figure) and the invented name for this figure in terms of its phonetic ending (in this case *bicron*, where the ending *-on* is associated with masculine gender). She found that 4-year-old children closely followed the phonetic cue in their selection of the article, but they used the semantic principle in selecting the pronoun.

Mills (1986) investigated gender assignment to animals and objects by German and English children. The assigned gender correlated highly with grammatical gender in German and pronoun use in English. But what of those that did not fit, particularly in German neuters? The question remained as to whether participants, rather than accessing the gender system, perceived gender-related attributes in the objects. To establish this, a semantic differential test was used. Participants were asked to rank the objects on scales such as large-small, strong-weak, tense-relaxed, which were shown to correlate with masculine-feminine attributes. Mills (1986) concluded that grammatical gender was the dominant influence on the choice of sex. However, a close investigation of the results reveals that Mills based this conclusion on only one case, *clock/Uhr. Clock* was perceived as having female attributes, took a masculine pronoun, and was personified as male. Several more cases like these would have to be identified before convincing claims could be made. Indeed, when Hofstatter (1963) investigated the perception of gender among German and Italian speakers, using a semantic differential attribute scale, he found that the grammatical gender had little influence on how the objects were perceived; rather, the perception was determined primarily by the attributes of the objects themselves.

The purpose of the present study was twofold: first, to explore the influence of a language's gender system on gender identification in a cross-linguistic study; second, to investigate when this relationship between language and thought begins. Native Spanish speakers represented the gender system group, and native English speakers, the non-gender system. It was hypothesized that the grammatical gender marker in Spanish would override perceived attributes and be the primary influence in the way adults conceptualize different objects and that the strength of the influence of the gender marker would increase with age, thus being weakest in the 5- to 7-year-olds and strongest in the adults, as the conceptual strength of the

gender tags increases. In the case of the English speakers, the gender attributed to an object, it was hypothesized, would be influenced primarily by the perceived gender-related characteristics.

It must be noted that although English is not a gendered language per se, gender-marked pronouns remain in conversational English. Hopper and LeBaron (1998) use the term *lively style* to refer to the gendered pronouns used in colloquial English as opposed to the grammatically formulated rules. For example, "look at the tiger, he's huge" may be uttered without knowledge of the tiger's gender. *Lively style* will be used in this way in this article. Thus, prior to the examination of gender assignment in the two language groups, it was necessary to establish the colloquial use of pronouns referring to animates and inanimates in English. Experiment 1 was designed to deal with this issue.

EXPERIMENT 1

METHOD

Participants

Sixty-four native-English-speaking participants (32 males and 32 females) cooperated in the study. They ranged in age from 19 to 22 (mean age 20).

Materials

Twenty nouns were tested, 10 animate and 10 inanimate referents.[1] Twenty sentences were prepared, one for each noun, with a blank in the text constructed along the lines of a cloze test (e.g., The elephant is in the circus_____is huge.). The blank had to be filled with a pronoun. Care was taken to avoid, as far as possible, personality characteristics or actions that might be associated with one gender and another and so prejudice the choice of pronoun.

Procedure

The test was conducted in a group setting and completed in 3 minutes. Participants were instructed to fill in the blanks as quickly as possible without thinking about the sentences too much.

RESULTS

The results, outlined in Figure 1, were analyzed using a 2-way chi-square, with animacy of the referent and the pronoun used (animate or inanimate) as the factors. There was no significant effect of sex of the participants, and the results were therefore pooled.

It was used almost 100% with inanimate nouns. The most common non-*it* pronoun used for inanimate objects was *she* and for animate objects, *he*. In the animate group, the nouns *tiger*, *monkey*, *frog*, *elephant*, and *snake* had a majority of *he* references; *bird* had *she* references. This confirms Mills's (1986) findings and reflects the use of *she/he* for certain nouns in a lively style. The noun *car* had more *she* references than the other inanimate nouns, thus confirming an association with a particular affective context (Mathiot & Roberts, 1979).

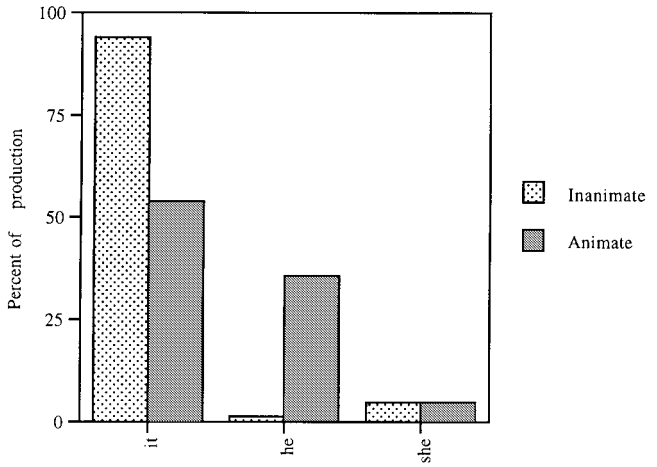

Figure 1: Use of Pronouns *It*, *He*, and *She* With Inanimate and Animate Referents in a Cloze Test of Sentence Completion
NOTE: The production of the pronouns is indicated as a percentage to compare the influence of animacy of the referent.

The findings of Experiment 1 show that although English is not a gendered language per se, animacy is a significant factor in pronoun reference in colloquial lively style and must therefore be considered when analyzing the results of Experiment 2.

EXPERIMENT 2

In a paradigm similar to Mills (1986), Experiment 2 examines the influence of language on gender identification in children (5-7 years old and 8-10 years old) and adults, using cartoon depictions of nonhuman species and inanimate objects. The representation of an object rich in idiosyncratic attributes is important for the perceptual processing of participants between ages 5 and 7 (Vurpillot & Brault, 1959). Thus, cartoons, highlighting the specific aspects of the objects represented, were employed. In addition, they are the preferred presentation format for children starting at the age of 18 months to 2 years (Hapkiewicz, 1979) and are understood in different cultures (Thompson & Zerbinos, 1995).

METHOD

Participants

One hundred forty-four native-English-speaking and 144 native-Spanish-speaking adults and children participated in the experiment.

The English-speaking participants were 48 adults (males = 24, females = 24), aged between 19 and 22 years (mean age 20), 48 children (males = 24, females = 24) aged 8-10 (mean age 9), and 48 children (males = 24, females = 24) aged 5-7 (mean age 5). The adults were students of University College, Dublin. The children were attending Schoil Chatriona in Dublin and were considered to be of average intelligence by their teachers. All of the English-speaking participants (from now on referred to as English participants) were Irish.

The Spanish-speaking participants were 48 adults (males = 24, females = 24), aged between 19 and 28 years (mean age 24), 48 children (males = 24, females = 24) aged 8-10 (mean age 9), and 48 children (males = 24, females = 24) aged 5-7 (mean age 6). The adults were students of Pontificia Universidad Catolica del Ecuador. The children were attending La Salle Colegio in Quito and were considered to be of average intelligence by their teachers. All of the Spanish-speaking participants (from now on referred to as Spanish participants) were from Ecuador.

Materials

Cartoons of 35 different objects were prepared. Each cartoon was in black and white and measured approximately 6 × 6 cm. The cartoonist employed to illustrate the objects was highly experienced and was careful not to incorporate any traits that might be interpreted as gender stereotypes. Color was therefore also eliminated. In an attempt to ensure that the cartoons were uniform in their representation of the objects, a group of 50 university students (not part of the participant population) was asked to rate each cartoon on a 3-point scale, where 1 = *unrepresentative* and 3 = *clearly representative*. Only cartoons scoring 3 on more than 80% of replies were deemed reasonable to use in the context of the study. This reduced the list to 20.

Booklets of 20 cartoons, representing 10 animate and 10 inanimate referents, were prepared for each participant. The booklets for the English and Spanish participants were identical apart from the language of the instructions.

For Spanish, the nouns included 11 of masculine gender (*watch*, *bird*, *car*, *tiger*, *sun*, *monkey*, *airplane*, *tree*, *elephant*, *fish*, *banana*) and 9 of feminine gender (*snake*, *bed*, *cup*, *teapot*, *frog*, *house*, *candle*, *flower*, *moon*); 5 of the nouns referring to animate objects that the cartoons represented were feminine and 6 of the nouns referring to inanimate objects were masculine.

Procedure

Participants were tested in groups according to their age and language, all in classroom situations. They were each given a booklet with cartoons of 20 objects and asked to put a typical male or female name to each cartoon and to mark each one as being male or female by circling a cartoon of a boy or girl opposite the particular cartoon. All instructions were given verbally in the native language of the participant by a native speaker. They were asked to work as quickly as possible.

RESULTS AND DISCUSSION

Within each language group, the results were analyzed using a three-way chi-square statistic for each age group. The null hypothesis was that there would be an equal division between the choice of male gender and female gender. A comparison was made between the gender of the noun and the gender selected for the cartoon. In Spanish, the grammatical gender is clearly defined; in English, the gender of the noun was defined according to the use of gender-marked pronouns as taken from use in lively style. The sex of the participant was also a variable in the analysis.

There was a strong statistical significance between the grammatical gender and the choice of gender in the Spanish 8- to 10-year-old and adult groups (8-year-olds: $\chi^2 = 19.37$, $p <$

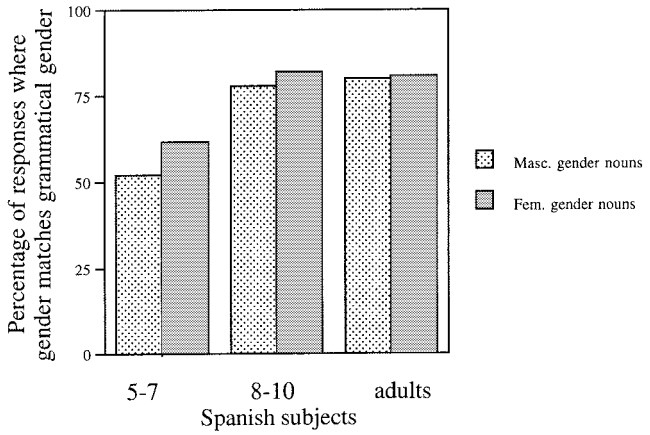

Figure 2: Assignment of Gender to Cartoons by Spanish Participants and Grammatical Gender of the Referents

NOTE: The results are presented here in terms of the percentage of gender assignments that matched the grammatical gender of the noun.

.0001; adults: $\chi^2 = 7.5$, $p < .01$), but not in the 5- to 7-year-old group ($\chi^2 = 2.304$, *ns*). This effect is represented graphically in Figure 2, from which it can be seen that the association between gender assignment and grammatical gender increases with age.

In English, the participants marked the gender of the six cartoons that were given a gender in Experiment 1 according to the lively style (5-year-olds: $\chi^2 = 14.75$, $p < .0001$; 8-year-olds: $\chi^2 = 57.28$, $p < .0001$; adults: $\chi^2 = 105.05$, $p < .0001$).[2]

The sex of the participants was a clear influence in the younger Spanish participants. In the young Spanish children, the boys made a significantly higher choice of male gender for the masculine nouns, and the girls made a significantly higher choice of female gender for the feminine nouns (5-year-olds: $\chi^2 = 29.32$, $p < .0001$; 8- to 10-year-olds: $\chi^2 = 255.2128$, $p < .0001$). However, the adult Spanish males and females made similar gender choices, regardless of their own sex ($\chi^2 = .8606$, *ns*).

The 5- to 7-year-old English boys made more choices of male gender for masculine nouns (as assigned in the lively style in Experiment 1), and girls made significantly more choices of female gender for feminine nouns ($\chi^2 = 4.26$, $p < .05$). For the 8- to 10-year-olds and adults, the sex of the participants made no difference to the choices of male or female gender for the nouns (8- to 10-year-olds: $\chi^2 = 3.10$, *ns*; adults: $\chi^2 = 2.88$, *ns*).

The interaction between age, sex, and cartoon gender assignment in both languages is illustrated in Figure 3. The younger children in both Spanish and English groups assigned roles according to their own sex more than the older children and adults.

The use of pronouns in English was established by examining actual language use, as generated from Experiment 1, rather than by applying generally formulated rules. According to such rules, the pronoun *it* should have been used in all cases, with the exception of *she* for the item *car.* This was not the case. The participants were of course forced to choose a gender in Experiment 2; they could not assign "it" to the nouns as in Experiment 1. On this basis, it is possible that the pronoun use is related to attributes of the referent, rather than the lively style usage. If this is the case, the gender assignment and the pronoun use may be only indirectly linked to each other through the common factor of the attributes of the referent.

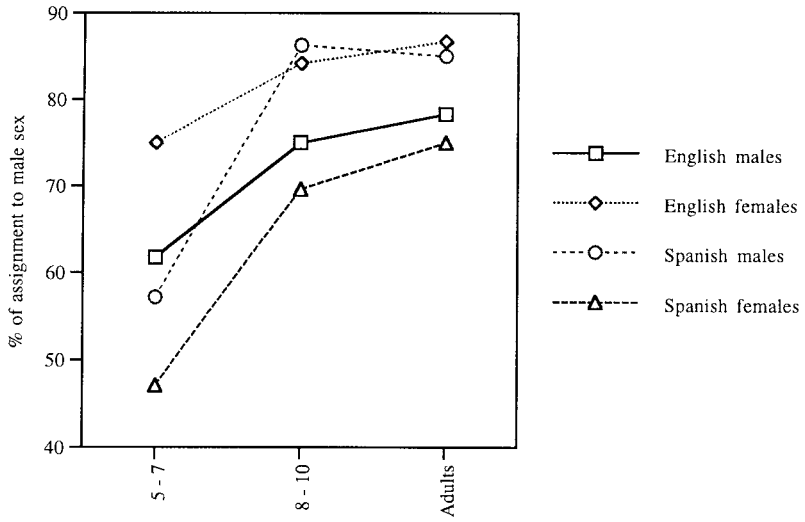

Figure 3: Assignment of Male Gender to Cartoon by Spanish and English Participants
NOTE: The assignment of male sex to the cartoon is represented here as a percentage to compare the two language groups and to show the influence of the participants' own sex and age.

In Spanish, there is no option such as "it" as a referent, where it is a viable option in English. This point in itself is one that already discriminates gender assignment in English from Spanish. For Spanish speakers, assigned gender is related to the grammatical gender of the referring noun. Other factors must be relevant, however, because no cartoon generated 100% agreement on the choice of gender. If grammatical gender alone determined the assigned gender, it would be expected that the masculine gender noun would have close to 100% selection of male gender and feminine gender noun 100% selection of female gender. It is likely that attributes of the referents were influential. The question then remains whether the attributes of the referents correspond to their grammatical gender. If this is so, the relationship found above could be explained on the basis of attributes, not grammatical gender. This was explored in Experiment 3.

EXPERIMENT 3

Experiment 3 was designed to investigate the relative influence of attributes on determining assignment of gender to objects in Spanish and English adults and children. Because many 5- to 7-year-olds are unable to read, this group would not have been able to complete the semantic differential test, and it was eliminated from Experiment 3. It was hypothesized that the gender attributed to the object would be influenced primarily by the perceived gender-related characteristics in the case of the English participants. Thus, the choices of gender made in Experiment 2 would match those of Experiment 3. However, with the Spanish participants the gender assignment would be influenced not by the perceived attributes but more by the language gender tags.

METHOD

Participants

Eighty English-speaking and 80 Spanish-speaking adults and children participated in the experiment.

The English-speaking participants were 40 adults (males = 20, females = 20), aged between 19 and 29 years (mean age 22) and 40 children (males = 20, females = 20) aged 8-10 (mean age 9). The adults were students of University College, Dublin. The children were attending Schoil Chatriona in Dublin and were considered to be of average intelligence by their teachers. All the English-speaking participants (from now on referred to as English participants) were Irish.

The Spanish-speaking participants were 40 adults (males = 20, females = 20), aged between 19 and 27 years (mean age 25) and 40 children (males = 20, females = 20), aged 8-10 (mean age 9). The adults were students of Pontificia Universidad Catolica del Ecuador. The children were attending La Salle Colegio in Quito and were considered to be of average intelligence by their teachers. All the Spanish-speaking participants (from now on referred to as Spanish participants) were from Ecuador.

Materials

A semantic differential scale, normed previously by Osgood, Suci, and Tannenbaum (1957) and shown to correlate with female-male traits (Mills, 1981), was used. Mills's (1981) 5-point scale was simplified to a 2-point scale of low-high, hot-cold, small-big, beautiful-ugly, and sad-happy, associated with feminine and masculine attributes, respectively, thus making the results of this attribute scale more comparable to the results of Experiment 1.

Booklets of cartoons of 20 different objects were prepared for each participant. The booklets for the English and Spanish participants were identical apart from the language of the instructions. The cartoons were the same as those used in Experiment 1. The five attributes were low/high, hot/cold, small/big, beautiful/ugly, and sad/happy and were listed beside each illustration.

Procedure

Participants were tested in groups according to their age and language, all in classroom situations. They were each given a booklet with cartoons of 20 objects and asked to mark each item on the following scales: low-high, hot-cold, small-big, beautiful-ugly, and sad-happy. They marked only one of the words on the 2-point scale. All instructions were given verbally in the native language of the participant by a native speaker. They were asked to work as quickly as possible.

RESULTS

For ease of presenting analyses, the ratings at high, cold, big, ugly, and happy were scored as masculine, those at low, hot, small, beautiful, and sad as feminine (based on Gill, 1967; Hofstatter, 1963; Mills, 1981). A participant was deemed to score an item as masculine or feminine if he or she scored three or more of the five-item scale as masculine or feminine, respectively. The results for the Spanish participants are shown in Table 1, and the English

TABLE 1
Assignment of Male Attributes to Cartoons by Spanish Participants

		Ages 8-10		*Adults*	
Cartoon	*Gender of Noun*	*M* (n = *20*)	*F* (n = *20*)	*M* (n = *20*)	*F* (n = *20*)
Watch	Masculine	3	3	4	5
Bird	Masculine	5	9	0	4
Car	Masculine	11	12	9	14
Tiger	Masculine	15	9	10	17
Sun	Masculine	15	12	15	18
Monkey	Masculine	12	10	6	4
Airplane	Masculine	12	14	9	17
Tree	Masculine	14	12	17	19
Elephant	Masculine	11	10	17	19
Fish	Masculine	8	4	8	8
Banana	Masculine	7	6	8	7
Snake	Feminine	9	15	17	16
Bed	Feminine	12	9	9	8
Cup	Feminine	5	0	8	7
Teapot	Feminine	8	6	8	9
Frog	Feminine	9	3	2	8
House	Feminine	14	16	14	14
Candle	Feminine	6	12	2	6
Flower	Feminine	7	2	2	3
Moon	Feminine	17	14	20	19

NOTE: Spanish children and adults (40 in each age group) were asked to score cartoons on a five-item scale. A participant was deemed to score an item as male or female if he or she scored three or more of the five-item scale as male or female, respectively. The results are presented in terms of the number of assignments to male sex.

participants, Table 2. The tables show the number of respondents who assigned male gender to the cartoons. By implication, the remaining number indicates the number of respondents who selected female gender. The cartoons are grouped in Table 1 according to the grammatical gender of the Spanish noun referring to the cartoon; the same order is kept in Table 2.

Within each language group, the results were analyzed using a three-way chi-square statistic for each age group. The null hypothesis was that there would be an equal division between the choice of masculine and feminine attributes. A comparison was made between the gender of the noun and the gender attributes selected for the cartoon.

With the English speakers, there was a significant relationship between the attributes assigned to the cartoons and the assigned gender as generated under forced-choice conditions in Experiment 2, for both the 8- to 10-year-olds ($\chi^2 = 5.96$, $p < .05$) and the adults ($\chi^2 = 5.46$, $p < .05$). Examination of the six nouns that were gendered in the lively style in Experiment 1 revealed that participants relied on perceived attributes to generate those genders (8- to 10-year-olds: $\chi^2 = 24.36$, $p < .0001$; adults: $\chi^2 = 38.70$, $p < .0001$).

In the case of Spanish, there was a strong relationship between the grammatical gender and assigned gender in both the 8- to 10-year-olds ($\chi^2 = 42.98$, $p < .0001$) and adults ($\chi^2 = 39.86$, $p < .0001$). The relationship between gender assignment and the attribute assignment for the 8- to 10-year-olds ($\chi = 3.007$, *ns*) was not significant, and for the adults ($\chi^2 = 5.446$, $p < .05$), it was a weaker association than that found between the grammatical gender and the gender assignment found in Experiment 2 ($\chi^2 = 7.5$, $p < .01$).

TABLE 2
Assignment of Male Attributes to Cartoons by English Participants

		Ages 8-10		*Adults*	
Cartoon	*Gender of Noun (lively style)*	*M* (n = *20*)	*F* (n = *20*)	*M* (n = *20*)	*F* (n = *20*)
Watch	Neuter	4	10	4	3
Bird	Feminine	10	2	4	3
Car	Neuter	20	14	16	20
Tiger	Masculine	20	14	18	20
Sun	Neuter	20	20	20	15
Monkey	Masculine	12	11	4	9
Airplane	Neuter	20	20	18	20
Tree	Neuter	20	20	14	20
Elephant	Masculine	16	19	18	20
Fish	Neuter	4	4	2	3
Banana	Neuter	10	16	8	7
Snake	Masculine	18	20	16	15
Bed	Neuter	20	8	4	10
Cup	Neuter	2	4	2	2
Teapot	Neuter	10	8	0	7
Frog	Masculine	2	10	10	10
House	Neuter	19	16	16	19
Candle	Neuter	8	6	2	6
Flower	Neuter	3	4	4	2
Moon	Neuter	20	20	12	20

NOTE: English children and adults (40 in each age group) were asked to score cartoons on a five-item scale. A participant was deemed to score an item as male or female if he or she scored three or more of the five-item scale as male or female, respectively. The results are presented in terms of the number of assignments to male sex.

The sex of the participants had no significant influence in the attribution of characteristics to the items in either the Spanish or English group.

CONCLUSION

The relationship between assignment of gender (Experiment 2), assignment of perceived masculine/feminine attributes (Experiment 3), and the gender of the noun in Spanish/colloquial lively style in English are consolidated for Spanish in Table 3 and for English in Table 4.

Gender as a language classification system offered the Spanish participants the possibility of classifying reality in this way, if it is appropriate to do so. In almost all cases, the gender attributed to the object matched the grammatical gender, overriding their perceived attributes. However, in the cases of *banana*, *house*, and *moon*, although the assigned gender matched the grammatical gender, the perceived attributes were of the opposite gender. *Banana* is a masculine noun yet the majority of participants perceived it as having feminine attributes. Considering the fact that according to Freudian symbolism, a banana is perceived as a symbol of male sexuality (Faraday, 1973), that finding was unexpected. A lengthy discussion of the perception of the term *moon* in Italian and German may be found in Hofstatter (1963).

TABLE 3
Assignment of Gender and Masculine/Feminine Attributes by Spanish Participants

		Ages 5-7	*Ages 8-10*		*Adults*	
Noun	*Gender of Noun*	*Assigned Gender*	*Assigned Gender*	*Attributes*	*Assigned Gender*	*Attributes*
Watch	M	F	M	F	M	F
Bird	M	F	M	F	F	F
Car	M	M	M	M	M	Neither
Tiger	M	M	M	M	M	M
Sun	M	Neither	M	M	F	M
Monkey	M	Neither	M	M	M	F
Airplane	M	M	M	M	M	M
Tree	M	F	M	M	M	M
Elephant	M	M	M	M	M	M
Fish	M	F	M	F	M	M
Banana	M	M	M	F	M	F
Snake	F	M	F	M	F	F
Bed	F	M	F	M	F	Neither
Cup	F	F	F	F	F	F
Teapot	F	F	F	F	F	F
Frog	F	F	F	F	M	F
House	F	F	F	M	F	M
Candle	F	F	F	F	F	F
Flower	F	F	F	F	F	F
Moon	F	F	F	M	F	M

NOTE: The predominant response of the Spanish children and adults in a sex attribute scale and sex assignment task is listed with the grammatical gender to show the relationship between these three aspects. It was impossible to record the assigned attributes of the 5- to 7-year-olds, because many could not yet read.

Among the 8- to 10-year-olds and adults, the gender attributed to the object matched the grammatical gender. It is interesting to note that Spanish children rated *monkey* as more masculine in terms of both assignment of gender (Experiment 2) and attributes (Experiment 3). However, although Spanish adults scored *monkey* as male 100% of the time in gender assignment in Experiment 2, the vast majority of participants marked *monkey* as having more feminine attributes. *Monkey* is a masculine noun. Thus, the question of the choice of gender for a particular object would appear to vary with age.

For the English participants, there was a strong correlation between assigned gender (under forced-choice conditions) and assigned attributes, in spite of the use of "it" in the lively style in Experiment 1. This is not surprising in light of the fact that English has a very limited grammatical gender system, and so to generate the lively style, participants probably assigned gender by characteristic attributes. Because Experiment 1 was not a forced-choice gender system, the participants did not assign a gender to every object. All 20 objects were given a gender that matched that of their assigned attributes with the exception of *sun*, *tree*, *house*, and *moon*. With these four objects, the gender assigned (female) was opposite of the attributed gender (masculine) in each age group.

TABLE 4
Assignment of Gender and Masculine/Feminine Attributes by English Participants

		Ages 5-7	*Ages 8-10*		*Adults*	
Noun	*Gender of Noun*	*Assigned Gender*	*Assigned Gender*	*Attributes*	*Assigned Gender*	*Attributes*
Watch	N	F	M	M	M	F
Bird	F	F	F	F	F	F
Car	N	M	M	M	M	M
Tiger	M	M	M	M	M	M
Sun	N	F	F	M	F	M
Monkey	M	M	M	Neither	M	F
Airplane	N	M	M	M	M	M
Tree	N	F	F	M	F	M
Elephant	M	M	M	M	M	M
Fish	N	F	M	F	Neither	F
Banana	N	M	M	M	Neither	F
Snake	M	M	M	M	M	M
Bed	N	M	M	M	Neither	F
Cup	N	Neither	M	F	F	F
Teapot	N	F	F	F	F	F
Frog	M	M	M	F	M	Neither
House	N	F	F	M	F	M
Candle	N	F	F	F	F	F
Flower	N	F	F	F	F	F
Moon	N	F	F	M	F	M

NOTE: The predominant response of the English children and adults in a sex attribute scale and sex assignment task is listed with the grammatical gender to show the relationship between these three aspects. It was impossible to record the assigned attributes of the 5- to 7-year-olds, because many could not yet read.

GENERAL DISCUSSION

The current results advance our knowledge of the cross-cultural understanding of language and gender. The dominant influence on Spanish adults and children aged 8-10 years when assigning a gender to a cartoon of an object was grammatical gender, whereas perceived attributes influenced the younger Spanish children and English speakers. However, other factors must be relevant, because few cartoons received 100% agreement on the choice of gender assignment. These findings are in line with investigations carried out by Mills (1981) and Gill (1967) on sex stereotypes in children's literature. Gender is predominantly assigned according to the grammatical gender of the referent noun. So, for example, *frogs* are assigned male sex in children's literature in Germany, corresponding to the masculine gender of *Frosch*, whereas a *dragonfly* is made female corresponding to the feminine gender of *Libelle*.

It is interesting to note that the situation for the Spanish 5- to 7-year-olds is quite different from their older counterparts. They assigned male and female gender, not according to the grammatical gender but according to the attributes outlined by their older counterparts. Unfortunately, it was impossible to record the assigned attributes of the younger children, because many could not yet read. However, it would appear that their records may indeed reflect their perceived attributes of the objects. The child would appear to begin to use a grammatical gender system as a classifier somewhere between 6 and 9 years of age. The results confirm the description of gender systems by several authors as the potential basis for

personification (e.g., Hjelmslev, 1956; Jespersen, 1924; Weinold, 1967). Jakobson's (1959) report of problems in translating personified nonanimate nouns into other languages suggests that these findings can be generalized.

The status of gender as an "omnirelevant noticeable" (Garfinkel, 1967, p. 118) in social interaction may be extended to language use itself. Thus, it is possible that just as cultures with a pronoun-drop language tend to be less individualistic than those with non-pronoun-drop languages (Kashima & Kashima, 1997), speakers of languages with gender tags may be more gender aware from an earlier age than speakers of languages with limited gender systems. Guiora, Beit-Hallahmi, Fried, and Yoder (1982) suggest that children learning Hebrew, which has grammatical gender, come to recognize their own gender identity earlier than those learning English (in which gender has a minor role) or Finnish (which has no gender category). It is therefore possible that acquisition of a language with or without a formal gender principle might influence cognitive processing.

Cross-cultural understanding of gender perception and language has implications for a range of areas, from language education and translation to gender stereotyping in children's literature. The issue of how a bilingual person, in, say, Spanish and Hindi (both gendered languages but with limited matching on those genders) might assign gender would shed further light on the impact of language on perception. Similar studies have been conducted on deictic reference (Flaherty & Richardson, 1996) and confirmed the influence of language on thought. Further cross-cultural investigation in this field will no doubt enrich our understanding of the link between language and cognitive flexibility.

NOTES

1. These words were chosen in preparation for Experiments 2 and 3. In Spanish, 9 of these nouns were feminine and 11 were masculine. The nouns referring to inanimate objects were *sun*, *moon*, *plane*, *candle*, *teapot*, *house*, *cup*, *clock*, *car*, and *bed*; to animate objects were *flower*, *tiger*, *monkey*, *frog*, *elephant*, *tree*, *banana*, *bird*, *fish*, and *snake*.

2. The results of the entire set of objects will be considered in the Results section of Experiment 3 by way of comparison to the findings of that experiment.

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