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## **Research Article**

# **Grammatical Gender Effects on Cross-linguistic Categorization**

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ARTICLE INFO	ABSTRACT
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Received: June 02, 2020 Accepted: July 14, 2020 Volume:3 Issue: 7 DOI: 10.32996/ijllt.2020.3.7.3	This article examines the effect that the terms used to describe grammatical gender (e.g., "masculine") and "feminine") have on a speaker's perception of how the marked lexical item may be classified. The overt classification can manifest itself in subconscious ways. For example, if shown a picture of a key and asked if it were in a cartoon if the voice would be a male or female, often speakers assign the voice based on how the noun is marked in their language: masculine in German and feminine in
KEYWORDS	Spanish. Further study is needed working with bilingual speakers or gender-marking languages and studies are needed that control of level of proficiency to see if the
Grammatical gender, linguistic typology, lexical categorization, psycholinguistics, semantics, philosophy of language	same effect is present for second language learners regardless of if L1 marks grammatical gender or not. It is clear that there is a categorization bias for gender- marking languages, but further study is required to control for variables that could contribute to the phenomenon.

## Introduction

Linguists, psychologists, and philosophers alike have debated for years as to the nature of the Sapir-Whorf hypothesis and to the extent of the influential relationship between language and thought. Many studies are advancing what scholars know regarding how speakers of a language categorize the real world based on the grammar of their language. Why is it that the word for the lexical item *a car*, *une* [FEM] *voiture*, is marked "feminine" in French, yet in Spanish it is marked morphologically as "masculine" *un* [MASC] *carro*? There is a general consensus that this grammatical system of marking causes speakers to categorize the nouns. Gender here refers not just to a grammatical means of categorization, but also biological gender in which traits of "masculine" and "feminine" can be imported to a grammatical marking. This process seems to manifest itself at a subconscious level. The product of examining this phenomenon is that we can better understand both language and cognition through this effect. In part one, I present the background on the psychological and linguistic concepts involved. I will present research in the field of categorizing cross-linguistically. Part two will focus on the mechanism of highlight properties most likely responsible for this effect, once again referring to the recent studies in the field. In part three, I will present a discussion of an outline of an experimental design that would further the research on categorization effect across languages. In part four, I will present a brief summary and conclusion.

## Background

### Definition and current state of the Sapir-Whorf Hypothesis

The Sapir-Whorf hypothesis is named for the linguists/anthropologists Edward Sapir and Benjamin Lee Whorf (with Franz Boas playing an influential role as a mentor). The hypothesis is described in Whorf's book *Language, Thought, and Reality* (1956) and is laid out in two parts. The first, often referred to as **linguistic relativity** alludes to the fact that languages have different grammatical categories, make different distinctions, and are structured differently. For example, for centuries many linguists and prescriptive grammarians have tried to classify grammatical categories of all languages into eight parts of



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speech, the same eight parts of speech that were used to describe Latin. The issue here is that many languages don't present grammatical evidence for all of the parts of speech that were present in Latin. In Lakota (Siouan), for example, we have little grammatical evidence of the existence of a category "adjective" or "adverb." In many case marking (synthetic) languages, prepositions are not present as they are in analytic languages. For example, the Latin ablative codes the preposition through a morphological suffix on the noun as in: oculis videre 'to see with the eyes.' The ending on oculis encodes the preposition 'with.' In Popular Latin we could see the move from synthetic to analytic as the form would have been oculi cum videre, where we actually have a free morpheme cum to code the relationship between noun and verb. Grammatical relations in these synthetic languages can be expressed through affixes rather than through separate morphemes. Also, many languages attend to different distinctions. In Russian, it must always be overtly stated as to whether the action (assuming an action verb is used) is completed or ongoing i.e., perfective or imperfective aspect. So for instance we have Ya chital kniqu 'I read the book (all of it),' which is perfective, which contrasts with Ya procital knigu 'I read the book (but didn't finish), which is imperfective. Some African languages attend to the ventive case, in which it is necessary to state through morphology on the verb whether an action took place near or far from the person speaking. An integral part of the Sapir-Whorf Hypothesis is that languages obligatorily code a certain function, attend to that function as cognitively salient. As far as languages having different structures, some language can't passivize a sentence by reducing valency and promoting the object to subject status i.e., The boy hit the ball. Passive: The ball was hit by the boy. Yet another example is the work done by Berlin and Kay (1969). Not all languages have all the basic color terms that exist in English. For example, some languages only have words for "light" and "dark." Others have a category in which blue and green are joined, the so called "grue" languages such as Lakota. Does this imply that the speakers of these languages perceive the world differently? Perhaps the languages simply have different coding means for the phenomenon. One way of looking at this phenomenon is that grammatical systems function like the law of the conservation of energy: linguistic coding means can't be created or destroyed, but it can change forms.

The second part of the hypothesis that was extrapolated by Whorf's followers was that of **linguistic determinism**. This strong version of the hypothesis is that language *determines* thought. In the strongest version of this hypothesis, translation was thought to be impossible. The idea is that how can we be sure that the idea of a concept such as "time" is the same in any two given languages? For example, in western culture we tend to view time as linear with the past to the left of the line and the future to the right (also assuming that we would be looking from right to left).<sup>2</sup> In other cultures, time is viewed as just the opposite. In those cultures, the past is in front of the speaker because they have already "seen" it, and the future behind them since it has not been seen and hence "unknown." Finally, a language (such as Hindi), in which many of the speakers believe in reincarnation, view time as circular. Some cultures such as Swahili believe that time is based not on hours and seconds, but by the growing season. Furthermore, how can we be sure that any two languages have the same mental prototypical concept of a concrete item, such as a "bird"? In North American the prototypical bird could be *robin*, but perhaps in a South American language is possible, we must assume that the "strong" version of linguistic determinism is not tenable. In the current state of the theory, the so-called weak version has become more or less accepted, that is that languages do not determine thought, but rather it *influences* thought. This assumption is central to the premise of this paper.

## What is a grammatical gender system?

A language that has grammatical gender marks nouns, determiners, and other parts of speech with morphology that reflects categorization. It should be first noted, that the term "gender" is not necessarily the best term for this phenomenon. The term comes from the Latin *genus* which means "kind" or "sort." Gender marking languages often mark two or three genders such as masculine, feminine, and possible neuter. We could just as soon call these class one, two, and three nouns which has been suggested by many scholars.<sup>4</sup> One idea that plagues the study of gender is the claim by Bloomfield that "gender is arbitrary." Here we must introduce an important distinction: **semantic (natural) gender** versus **phonological gender**. Semantic gender refers to animate nouns (and some inanimate) nouns that their lexical meanings convey overt gender e.g., in German, *der Man* 'man' is masculine and *die Frau* 'woman' is feminine. Oddly enough, the German word for 'young girl', **das Madchen** is marked as 'neuter.'<sup>5</sup> This system of semantic gender is common to Dravidian languages as well. In both cases, it is of note that historical phonological and semantic changes can play a role in how some of these 'quirks' develop, but it could also be a sociolinguistic variant. For example, Swedish marks the polite T/V (tu/vous) distinction, but if one falls

<sup>&</sup>lt;sup>2</sup> This is interesting in that much of the literature claims that much of this has to do with how a language's writing system works i.e. in western languages we read from left to right.

<sup>&</sup>lt;sup>3</sup> The notion of prototypical categories comes from the work of Eleanor Rosch.

<sup>&</sup>lt;sup>4</sup> Most notably an idea by Dixon when working on Dyribal (Australian).

<sup>&</sup>lt;sup>5</sup> This can be traced to a historical distinction. 'Young woman' came to be marked as differently than 'woman.' It is interesting that no such distinction exists for 'young man.'

into the middle of the category by being neither older or in a higher socioeconomic position nor a younger lower socioeconomic distinction, they would use a third "neutral" distinction to refer to the person i.e., they would refer to someone in the third person. By metaphorical extension, nouns that are inanimate can fit into either category based on a cultural stereotype e.g., cookware is feminine, and hunting materials would be masculine. For other nouns that aren't overtly male or female, a neutral gender can be used. This evidence suggests further sociolinguistic study on how cultural stereotypes can vary from culture to culture.

The other type of gender is phonological. This type of gender based on sound patterning and is common in Romance languages such as Spanish and Italian. In these languages, the noun's ending and the definite article clue speakers in to the words being "gender loaded." This system is commonly referred to as being arbitrary in that there is not reason for an animate noun to be marked masculine or feminine. Historical sound change and semantic processes such as borrowing and clipping can account for mismatches and also why some languages of the same family have cross linguistic nouns that differ in gender. For example, *la mano* in Spanish and Italian is marked masculine on the noun, but feminine on the definite article. Also, many Spanish nouns that end in -ma are Greek in origin and are marked masculine by the definite article and feminine on the noun. Yet another phonological process that plays into this scheme is what is referred to in Spanish as a tonica. If a noun begins in a stressed /a/, it will take a masculine definite article in the singular even though the noun itself may be marked feminine e.g., *el aqua*. There must be a distinction between this type of phonological system, and one where due to phonological processes, only the definite article cues speakers to the gender of the noun. This system would be the case in languages such as German and French where there is not overt lexical termination that identifies the gender of the noun. For example, in Spanish and Italian -o tends to mark masculine and -a feminine, but there are no such correspondences in German and French.<sup>6</sup> As a consequence, a speaker of German or French must hear the noun with its accompanying complements (a singular definite article or an adjective) in order to determine the gender. For second language learners, this means they must memorize the article with the noun. In summary, animate nouns are much easier to classify and typological strategies vary from language to language. Another caveat is that gender can refer to a biological category as well as to specific traits of the noun in question.

## Recent work in the field

Most recently, Maciuszek, Polak, and Świątkowska (2019) examined the implicit nature of grammatical gender in Polish. Based on three experiments, they determined that: 1) "the grammatical gender of nouns influenced perceived similarity of words in case of animals, but not inanimate objects or abstract concepts.", 2) "results suggest that grammatical gender seems to be of implicit nature, as grammatical gender consistency influenced reaction times and the number of classification errors.", and 3) "participants assigned male and female voices to animals and inanimate objects, which were presented either as words or as pictures. Grammatical gender effects occurred for both animate and inanimate objects and were similar for verbal and visual stimuli. It turned out that in the Polish language the influence of grammatical gender may occur on the lexicosemantic level and the conceptual level, and concerns both animate and inanimate objects." Maciuszek, Polak, and Świątkowska (2019).

Sato, Gygax, and Gabriel (2013) examined English and French bilinguals and demonstrated that French, a grammatical language, and English, a natural gender language, constructed mental representations of gender association that "shifted" based on which language they were being tested in.

A study by Presson (2005) compared German and Spanish speakers in classifying nouns based on gender and animacy. The purpose of the study was to use a connectionist<sup>7</sup> model not only to see if there were effects of gender marking on categorizing, but also if the effects differed depending on whether the language was German or Spanish. Participants were shown pictures of objects and participants were given values to rate. For example, they would be shown a picture of a fish and asked to rate how "loud" the picture was. As predicted by Presson's model, if fish was masculine in the language, participants identified it as "loud" which is subjectively a masculine trait. On the contrary, if the noun was marked feminine then it was rated as "quiet." This example exemplifies how the sociolinguistic factors effect languages due to cultural stereotypes.<sup>8</sup> Different clustering effects were found in both Spanish and German, suggesting that the subjective categories differ between the languages. One must look skeptically at the issue of subjectivity in categorization. In this case, how can we

<sup>&</sup>lt;sup>6</sup> This is due in part to the historical weakening of word endings in German and French. Even more interesting, is that they both neutralize gender in the plural i.e. the same article marks both masculine and feminine nouns.

<sup>&</sup>lt;sup>7</sup> Connectionism views behaviors as emergent processes of interconnected simple units. This is a concept in which neural networks have components which activate one another, such as in a chain. Its principle use here is to explain a *learning algorithm*. See Pinker and Mehler (1988) for one widely accepted view of the model.

<sup>&</sup>lt;sup>8</sup> There is, however, some phonetic data to support this effect. Men's voices are louder due to shortened vocal tracts (on the average) and higher lung capacity.

be sure that "loud" and "quiet" convey masculine and feminine qualities, respectively, across languages? This variable is a common issue in many studies, that is, finding connotations that are the same cross-culturally. Perhaps they could consider terms that apply to the physical body, but even that varies across languages but to a lesser degree.

Boroditsky and Phillips (2003) focused on the same issue, but in this study attention was given to the theoretical viewpoint of *why* speakers would perceive grammatical gender as meaningful. The first point they mention is that "children learning to speak a language with a grammatical gender system have no a priori reason to believe the grammatical gender doesn't indicate some meaningful distinction between types and objects." When a child is learning a language, they hear the different grammatical forms and have every reason to believe that the distinction being made is contrastive in the language. The second reason offered is that "since most children grow up learning only one language, they have no opportunity to perform the comparative linguistics necessary to discover the seemingly arbitrary nature of grammatical gender assignment." If the children were to compare a gender marking vs. non gender-marking language, they would find that the distinction would be perceived as arbitrary<sup>9</sup> because any given noun could be gender marked masculine in one language, and feminine in another. Their final point is that "the sheer weight of repetition (of needing to refer to objects as masculine or feminine) may leave its semantic traces making the objects masculine or feminine qualities more salient in the representation." This brings to light Joan Bybee's work on frequency effects; the more a form is used, the more it becomes **entrenched.** The same effect occurs on irregular verbs; the more an irregular verb is used, the less likely it is to be regularized in a paradigm. This study takes into account the acquisition of this grammatical coding means of gender marking.

Sera and Elieff et al (2002) probed much further into the categorization and grammatical gender interaction by taking into account the gender systems of the languages into account. They ran a series of tests to support the general claim that speakers of a grammatical gender-marking language appear to be biased in categorizing. This study went much further into depth by then comparing the effects of languages like Spanish and French (which have a two gender system) with a language like German (which has a three gender distinction<sup>10</sup>). In their study, they asked speakers to look at a series of objects and assign a voice to them (male or female) that would best suit them (the inanimate objects) in a movie. The main finding of the study was that while speakers of Spanish and French were biased in a predictable way, speakers of German were biased to cross-linguistic categorizing, but not in the same manner cross linguistically as the Spanish and French speakers. The major view of the study is that it is "a grammatical gender system with two gender categories, and with a high correlation between grammatical and natural gender, leads to overgeneralization of masculine and feminine traits to inanimate objects." This study also contained control groups where in some experiment participants were given simply the picture, and others were given the picture of the object and a lexical label. A surprising finding of this study is that speakers of English (a non grammatical gender-marking language) participants were able to assign gender to inanimates above the level of chance in the same way that Spanish speakers were able to (Spanish being a gender-marking language). This finding is extremely interesting and would be a great experiment to replicate by beginning to exploit the data in order to find out what variable(s) are present that are allowing this unpredictable effect.

Another feature that has not been given due attention in many studies is an assessment of speaker proficiency in the studies. All speakers used were reported to be native speakers of the language in which they were being tested, but little attention was given in the studies to how "balanced" a speaker was when testing in two languages. Say there was a study testing German and Spanish, it is possible for a given speaker to be a native speaker in both languages (say the participant is thirty, lived in Germany his entire life with a German mother but had a Spanish speaking father). The issue here is that the speaker was educated in Germany, and may have a superior command of German, but only an advanced command of Spanish. Some may argue that the native speaker feature is all that is required, but I find it difficult to separate a native speaker's experiences and frequency of use of a language from just his/her hard wired ability to make grammatical judgment.

The studies have not taken into account the role of self talk. The bilingual speaker of German and Spanish could be answering the researchers' questions in Spanish, but be thinking in German. To control for this, some studies have used verbal suppression in which the participant is asked to perform a verbal task (such as counting or reciting something in a language) to influence the effect of "language for inner thought."

<sup>&</sup>lt;sup>9</sup> Investigating how children learn to associate grammatical gender and biological gender could add substantially to what we know about the process of categorizing the real world based on gender extension. A logical assumption would be that formal education plays a part in this process i.e. learning grammar in school. An interesting study would be to evaluate educated and non-educated speakers of gender marking languages. Another possibility could be that children overgeneralize. If *el chico* is 'boy' and marked masculine, and *la chica* 'girl' is marked feminine, than semantic gender could be used as a base for phonological gender.

<sup>&</sup>lt;sup>10</sup> I will take up this point again in my criticism of the current work below.

## Mechanism(s)

Strategic judgment bias, changed object description, and highlight properties are all viable psychological explanations for this effect, but I believe highlight properties to be the best supported. As Boroditsky and Phillips (2003) stated: "the sheer weight of repetition (of needing to refer to objects as masculine or feminine) may leave its semantic traces making the objects masculine or feminine qualities more salient in the representation." This suggests that token and frequency effects are highly responsible for the effect. This would further be supported by the fact that many of the gender-marking languages also have adjective and noun agreement, which enforces that property highlighting ever more. Through this mechanism of highlighting properties, names of items draw attention to particular features or properties of a category, and help the speakers attend to relevant features and ignore irrelevant ones. For example, even if I were to assent a nonce word in a gender-marking language (that conforms to the phonotactics of the language in question) speakers would immediately make assumptions about the word based on how it is marked in the language. In these studies, the nouns come with a marker (connotation) that allows speakers to project/extend features of the markings with qualities. For example, an /o/ ending of an Italian word generally marks "masculine" gender. Say I show a native speaker a picture of a book which is libro in Italian. If I ask the native Italian speaker (as did Sera and Elieff et al (2002) what voice the book would have in a cartoon, the speaker would more than likely respond that it would have a male voice. They may offer some adjectives to describe the book that could be subjectively masculine. Now, say I give the speaker a nonce word (spoken verbally) such as borno. With the absence of meaning (and visual stimulus), the speaker would still assign a masculine voice to the object on the account that the word is "gender loaded" by virtue of the fact that it ends in /o/. This is what I believe presents the strongest evidence for explaining this phenomenon. The phonological markings that we have access to within our mind carries with it the traits of the marking i.e. masculine traits are extended to words marked masculine and feminine traits are extended to those words marked feminine. Since many languages refer to this as gender marking, it carries with it the cultural extension. In many gendermarking languages, the markings are classified as "masculine" and "feminine." Therefore, subjective masculine and feminine traits are extended to words that are marked for either gender. I would expect that in a language like Dyribal that no such bias would exist, as that language marks nouns with 'classes' such as class 1, class 2 etc.

There is an effect that I am proposing in light of the variables involved with the study of gender-marking languages that I will call the *override condition*. The effect that is being described in this paper is purely a **phonological** effect. That is, the meaning being extended comes from sound patterning, which can be from historical reasons. If the native speaker has **semantic** access to the item, the effect can be overridden. For instance, the noun *el vestido* 'dress' is marked masculine in Spanish, but I believe that any native speaker would likely assign "feminine" to the object based on its semantics. Similarly, if I were to give a list of items to a speaker of a gender-marking language, they would first try and categorize by any semantic categories present. For example, I give the speakers a list of ten items and five were marked masculine and five feminine and ask them to categorize the objects. Let's say that two of the items are pieces of furniture and two three are food items. The speaker will categorize based on meaning rather than sound if they have the opportunity.<sup>11</sup>

Vigliocco et al (2005) also present an excellent discussion of what mechanisms may be responsible for this categorization effect. One is that "words that have similar syntactic and morphophonological properties also tend to have similar meanings." This is one way in which children can "bootstrap" themselves in order to learn grammar. For example, the study points out that the count/mass noun syntactic distinction in English can help children to learn the differences between entities and "stuff." Another hypothesis reported in this work is dubbed the similarity and gender hypothesis. This posits that across languages, the effects will be present regardless of how many genders the language codes. This is due to the fact that there are universally similar contexts across the languages that, provided the language is morphologically rich, will provide gender bias for all words regardless of the referent. This effect could be examined in my experiment design below.

## **Experiment Design**

Is there a hierarchical relationship at work that speakers of gender-marking languages will observe when categorizing inanimate objects? The experiment here would be to see if speakers of gender-marking languages would categorize a list of inanimates on semantic or phonological grounds if they were not given explicit instructions. The goal of the experiment is to further our understanding of the effect of gender on categorization by testing to see if there is a preference for categorizing based overt phonological markings, or the more covert semantic meaning. The study would involve superior level native speakers of French, Italian, and Spanish and they would be tested solely in their native language. In the first part, they would be given a list of words that are mixed gender inanimate objects with definite articles. Also, a control group would be given the same condition but with pictures and labels (to see in any effect can be seen with the added visual cues). The items would be presented in random order, and could be presented either on a card board where the participants can move the objects,

<sup>&</sup>lt;sup>11</sup> This point is also treated below under my proposal for further study.

or on paper. The inanimates would also belong to a semantic category as well. Some examples could be: types of furniture, eating utensils, general car parts etc. The participants would be asked to then place the objects into categories based on any criteria that they choose. The prediction here is that the covert semantic category will be the basis of categorization, and the speakers will categorize based on what semantic category the nouns belongs in. An interesting twist would be to add several items that don't fit a semantic category, and see what the speakers do. There may need to be a control condition here for how many categories they can make, but a pilot would better determine if that was necessary.

## **Summary and Conclusion**

The studies above clearly show a psycholinguistic effect speakers experience if they speak one or more gender-marking languages. From this discussion, we have seen excellent evidence for the fact that gender-marking languages bias speakers to assign "gender" extensions to inanimate objects and furthermore, we have established that certain cognitive mechanisms are at work here, mainly through highlighted properties of feature differences. This data also support that the language we speak does in fact influence thought. The morphological markings on the nouns carry with them features of the name for the marking's category i.e., masculine and feminine. The main limitation of these studies is finding bilingual speakers who share the same variables. Future work could look into more effects regarding second language learners. For example, will advanced second language learners of a gender-marking language show the same bias? Also, future study could consider languages that categorize, but don't mark the distinction through gender. Children and language acquisition can also add a new dimension to this effect, especially with bilingual children.

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