



## GRAMMATICAL GENDER AND OBJECT PERCEPTION OF ENGLISH-ARABIC BILINGUAL CHILDREN

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### **Abstract:**

The main purpose of this study was to investigate the possible effects of grammatical gender on objects perception. It examined how Arabic grammatical gender system can affect objects' perception of Arabic native speakers. The sample of the study consisted of ninety eight English-Arabic bilingual children. A cognitive experiment was carried out in order to investigate gender effects (picture similarity task followed by confidence scale). The result of this study revealed that there was no effect of Arabic grammatical gender on object perception of the participants. The study revealed that Arabic-English bilingual speakers end up thinking about objects which are grammatical gender in Arabic as neutral depending on the object's grammatical gender in their second language.

**Keywords:** linguistic relativity, language and thought, grammatical gender system

### **1. Introduction**

Languages differ from each other in numberless ways starting from differences in pronunciation to differences in grammar. Such differences in the production lead us to think about perception. Linguists wondered if the languages we speak shape the way we think and do speakers of different languages perceive the world differently. The relationship between language and cognition is known as the 'Linguistics relativity hypothesis' (LRH). This idea can be traced back to the writings of Whorf (1956) when he established his hypothesis named Whorfian hypothesis. One of the most noticeable ways in which a language differs from another is whether a language assigns grammatical gender to nouns or not.

The present study addresses the relationship between language and thought in the human mind. More specifically, it investigates the effect of grammatical gender assigned to objects (moon, spoon, table, fox, fog, whale) by Arabic language on English-Arabic bilinguals' mental representations of that objects. It aims to test whether an objects' name

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being grammatically feminine or masculine in Arabic language leads Arabic speakers to think of the object itself as more like a male or a female (pictures similarity task).

Research on grammatical gender has been conducted mostly in Indo-European languages rather than Semitic languages which means “*further studies involving non-Indo European languages are necessary to access the generality of these findings*” (Boroditsky, 2003:78). Arabic is a Semitic language which has been undertaken rarely in this field. One of the studies that undertake Arabic is the study conducted by Clarke (1981) in which the task used was a verbal one that lead the participants to think directly of the language. Another study was conducted by Almutrafi (2015) in which the tasks are specifically based on monolinguals adult speakers. The novel dimension in the present study is that the participants are children bilinguals. Arabic speakers’ response is investigated under one task; namely picture similarity task followed by a confidence scale.

### 1.1 The significance of the study

This study attempts to fill in the gap which is the influence of grammatical gender on objects’ perception of English-Arabic bilingual children.

### 1.2 Research question

- Can grammatical gender in Arabic affect the perception of English-Arabic bilingual children?

## 2. Literature review

One of the testing grounds for studying the possible influence of language on thought exploits the fact that grammatical gender systems differ considerably between languages in terms of both the number of gender distinctions individual languages and the degree to which grammatical gender correlates with biological gender (de Groot, 2011). Many languages have only masculine and feminine genders, whereby all nouns must be gendered such as Arabic. In Arabic, all nouns have grammatical gender whether they refer to inanimate or animate objects. For animate objects: the grammatical gender depends on the biological sex, e.g. “*raju*” ‘man’ is masculine while *fatah* ‘girl’ is feminine. Other languages have three genders as in Tamil language in which there are masculine, feminine and neuter, and its gender can be given obviously from their properties. Nouns denoting men (and male gods) are masculine, those denoting women and goddesses are feminine, and everything else such as objects, animals and infants is neuter (Deutscher, 2010). Others usually assign nouns to four genders; masculine, feminine, animal, and neuter, as in Zande language, which is spoken largely in the Democratic Republic of the Congo (Corbett, 1991).

The gender has two types: natural and grammatical gender. Natural gender is a semantic principle where the noun meaning determines its gender, and grammatical gender is a formal principle where the morphological and phonological structures play a part in determining the gender. Sometimes, there is a correspondence between natural and grammatical gender in languages’ words. For example, the Arabic words *Bent* ‘girl’,

and *Imra'ah* 'woman' are naturally and formally feminine and *Rajul* 'man', and *walad* 'boy' are naturally and formally masculine. However, other times there is no correspondence between words' natural and grammatical gender. For example: the Spanish words: *Libro* 'book,' *suéter* 'sweater,' and *disco* 'disc' are grammatically masculine words and *luz* 'light,' *media* 'stocking,' and *impresora* 'printer' are grammatically feminine words, even though all of them have neuter natural gender (Tight, 2006).

## 2.1 Research on grammatical gender and perception

Earliest studies on the effects of grammatical gender on bilingual cognition started with the work of Ervin (1962) who studied the role of Italian grammatical gender in Italian monolinguals and Italian-English bilinguals. The English Italian bilinguals who acquired English as early age were not affected by the gender system of their first language (i.e. Italian language). This study demonstrates that learning a second language – especially a genderless language- in earlier age will remove the effect of the native language.

An experiment conducted by Lera Boroditsky and Webb Philips (2003) was designed to test whether an objects' name being grammatically feminine or masculine in a language leads speakers of that language to think of the object itself as a male or female. The participants are Spanish-English and German-English bilinguals. The experiment is that pairs of pictures appear on the screen, in each pair, one picture is an object or animal and another is a picture of a person. The participants are asked to choose a number of scale from 1= not similar to 9= very similar depending on how similar the two things are. The result is that there is a greater similarity between people and objects of matching gender than between people and objects of non-matching gender. This suggests that Spanish and German speakers indeed end up thinking about objects as more similar to biological males and females, depending on the object's grammatical gender in their native language.

As an extension of Boroditsky and Philips' study, Chaudhuri (2006) conducted a number of experiments that were on similar lines as theirs. Three groups of bilinguals were used as subjects for three different experiments. The results of these experiments demonstrated that grammatical gender in one language does have an effect on the perception of objects.

There is an experiment conducted at Moscow psychological institute in Russia to investigate this question: can the grammatical gender of inanimate objects influence speakers' associations? The participants were monolingual and were asked to imagine the days of the week as a particular person and to describe this person. The participants envisaged Monday, Tuesday, and Thursday as men and the other days as women. When they were asked about their choice, they did not give a precise answer, but the researchers concluded that Monday, Tuesday, and Thursday have a masculine gender in Russian whereas Wednesday, Friday and Saturday are feminine. In Russian language, Nouns ending in –a such as *среда* "Wednesday", *пятница* "Friday", and *суббота* "Saturday" are feminine, nouns ending in –ик such as *понедельник* "Monday", and *вторник* "Tuesday" are masculine, and nouns ending in –я are usually feminine but there is an

exceptional words that could be masculine such as *четверг* “Thursday” (cited in Deutscher, 2010).

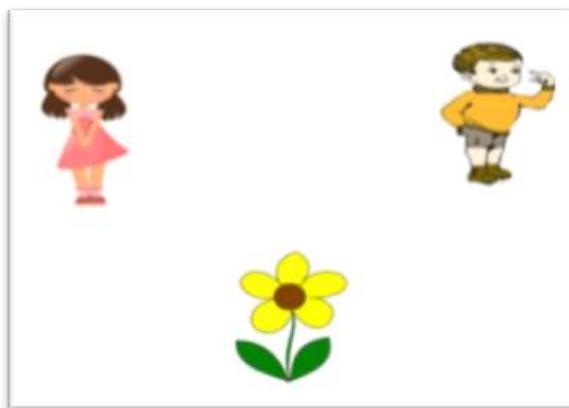
### 3. Method

#### 3.1 Participants

Ninety eight Arabic-English bilingual children participated in this experiment on a volunteer basis, in which Forty six were male and fifty two were female. All were native speakers of Arabic language, ranging in age from 8 to 13 years. The participants were chosen randomly. They were primary students at two international schools. They were highly proficient in English language, as they acquired English language when they were Kindergarten students. None knew the purpose of the task before and after they participated.

#### 3.2 Materials (Picture similarity task)

The materials consisted of 12 pictures of objects and animals and 8 pictures of people. The pictures of people which are the control items, 4 are pictures of female (queen, girl, grandmother, and bride) and 4 are pictures of males (king, boy, grandfather, and groom). The objects and animals’ pictures that are test items, half will be grammatically feminine nouns and the other half will be grammatically masculine nouns. There were 12 stimulus slides, and in each one there were pairs of pictures of people on the screen one is a female and the other is a male; The target picture of objects appeared under each pair ( see figure1). This task is a speeded task for 4 seconds because if learners are given limited time to respond, this may encourage them to rely on implicit knowledge. In contrast, unlimited time may allow them to access explicit knowledge (Bialystok, 1979).



**Figure 1:** Example of stimulus trial

The task is followed by a confidence scale in which each participant provided a similarity rating for the target picture and the chosen picture on a scale of 1 (similar) 2 (not similar) 3 (not sure).

### 3.3 Procedures

Stimuli were presented on a computer display programmed with PsychoPy program. The participants completed the experimental task in English language and read the following instructions: *"In this experiment you will see pairs of pictures appear on the screen and one picture appears under each pair as indicated in the figure to the right. Your job is to click on a picture from the pair which best matches the picture the picture below. You may not be sure which one to choose. If this is the case, you could give your first impression. Remember that you have only 4 seconds to choose. So, try to respond as quickly and accurately as possible. You will be then asked to report how similar the picture you have selected with the picture under them is. Remember that there is no time limit to report similarity"*. Participants saw a picture of a target object and were asked to pair it with one of the two reference pictures located to the left and right above it. After that the participants saw a slide that promoted them to give a confidence scale by asking them a question "How similar it was" between the target picture and the reference picture they had selected on a scale of 1 (similar) 2 (not similar) 3 (not sure). To avoid participants from engaging in a conscious mind in responding, the task was a speeded task (see Boroditsky, et al. 2003).

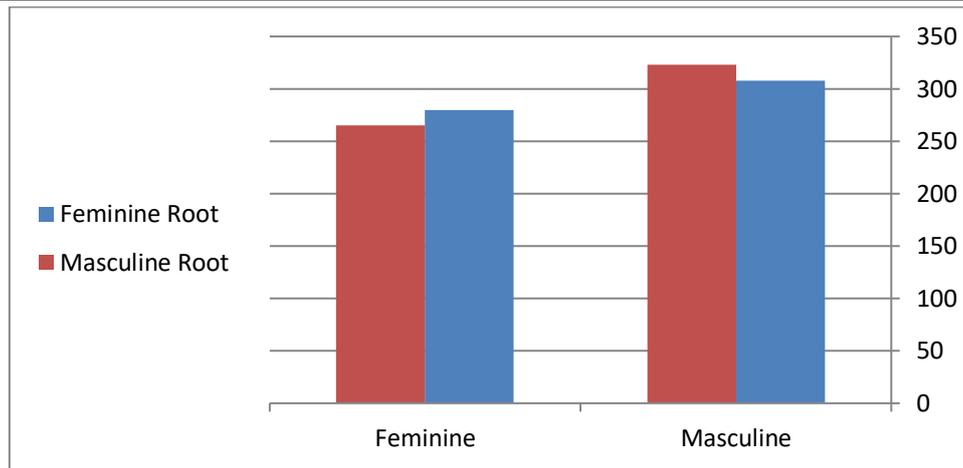
### 4. Results

Frequencies, means, and standard deviations of responses have been calculated on pictures. They are (12) pictures distributed on all what is measured to be perceived as masculine or feminine. This distribution of pictures is intended to measure how the sample are able to perceive the masculine grammatical gender of the objects' name in their native language (the target picture) with the masculine biological gender of the person (one of the two pictures above) and to perceive the feminine grammatical gender of the objects' name in their native language (the target picture) with the feminine biological gender of the persons (one of the two pictures above).

**Table 1:** Percentage of correct and incorrect responses

	Masculine	Feminine	Total Observations	Percentage Feminine	Percentage Masculine
Feminine Root	308	280	588	47%	53%
Masculine Root	323	265	588	46%	54%

As it is observed in the table, the correct responses of feminine perception pictures that measure feminine-feminine are about 280, while incorrect responses, that realize feminine as masculine, are about 308. So, the percentage of feminine correct perception was 47%, while incorrect responses of feminine were 53%. This means that there is a problem in the perception of feminine. On the other hand, in the masculine perception, the correct responses of masculine-masculine were 323, while incorrect ones that perceive masculine as feminine were 265. The proportion of correct perception was 54%, while the incorrect perception was 46%.



**Figure 2:** Masculine and feminine perception root

The graphic chart clarifies that masculine root is higher than feminine root. While both perceptions are near in average even those who are incorrect in masculine and feminine perception. This manifests that Arabic language speakers' perception is not affected by their grammatical gender system.

The task is followed by a confidence scale as which shows the similarity perception as similar, not sure and not similar. They are calculated for 12 pictures according to masculine and feminine perception.

**Table 2:** Percentage of both masculine and feminine grammatical gender picture via confidence scale

	Feminine		Masculine	
	Total Observations	Percentage	Total Observations	Percentage
Similar	324	55.10204	299	50.85034
Not sure	117	19.89796	123	20.91837
Not similar	147	25	166	28.23129
	588	100	588	100

The above table shows the distribution of similar, not sure, and not similar responses of total sample. The results conclude that the highest value of similar is in feminine grammatical pictures, as it is higher than similar in masculine grammatical pictures. Whereas the highest value of not similar is masculine grammatical pictures against feminine grammatical pictures. While not sure is nearly approximate in masculine and feminine grammatical pictures. The similar choice in both feminine and masculine grammatical pictures is agreement. So, a great percentage of the participants were sure about their matches in the twelve trials. At the same time, great percentage is in between not sure and not similar. This asserts the impact of English learning and teaching on feminine and masculine grammatical gender in Arabic language.

## 5. Discussions

This study aimed to investigate the effect of grammatical gender assigns to objects by Arabic language on English-Arabic bilinguals' mental representations of that objects. It aimed to test whether objects' name being grammatically feminine or masculine in Arabic language leads Arabic speakers to think of the object itself as more like a male or a female. The picture similarity task followed by a confidence scale tried to investigate if the grammatical gender affects concepts and how grammatical gender of Arabic language influences the perception of Arabic-English bilinguals.

The results obtained from the picture similarity task with Arabic-English bilinguals revealed that there is no effect of Arabic grammatical gender on Arabic-English bilinguals' perception of objects. This suggests that Arabic-English bilingual speakers indeed end up thinking about objects which are grammatically gender in Arabic as neutral depending on the object's grammatical gender in their second language. Subjects' responses to match masculine- masculine grammatically pictures or feminine-masculine grammatically pictures are higher than feminine- feminine or masculine feminine grammatically pictures. In this experiment, the correct responses of feminine perception pictures that measure feminine are less than incorrect responses that realize feminine as masculine.

The high value of subjects' response in feminine- feminine match in which picture 4, 10, and 1 can be explained by the claim of Boroditsky & Schmidt (2003) that people's shared beliefs about the gender of objects are reflected in the assignment of grammatical gender. Animals or things, for example, may have stereotypically feminine or masculine qualities and likely to have consistent grammatical genders across languages. The names of animals that are beautiful may tend to be grammatically feminine, while those of aggressive and strong may tend to be masculine. The same claim is considered by Bassitti & Nicoladis (2016) in which they believe that grammatical gender is one way in which cultural attitudes are communicated. Although English does not have a grammatical gender system, Nicoladis and Foursha-Stevenson (2012) showed that English monolingual speakers shared intuitions about gender assignment to objects. Likewise, Wilkie and Bodenhausen (2012) showed that English speakers tend to assign odd numbers as masculine and even numbers as feminine. Thus, in the present study, the high values of feminine- feminine match were pictures 4 (rose), 10 (rabbit), and 1 (apple), they got this high value because they are soft, small, and beautiful objects, therefore, they tend to be grammatically feminine despite the fact that the word *rabbit* is not grammatically feminine in Arabic language.

The results of this study were an evidence to support the idea that knowing more than one language will affect the native grammatical language system, and the person will no longer think as a monolingual (Cook, 1991). It supports the argumentation that language induced biases in people's worldviews could be eliminated by learning additional languages (Sapir, 2004; Whorf, 1956) This study supports other studies e.g. Bassitti (2007, 2010) and Kausta, et al. (2008) that investigated the effect of learning a second language on the perception of the grammatical gender of the person's native

languages. They concluded that grammatical gender of the native language is affected by the second language.

Other linguistic and socio-cultural factors can be taken into consideration such as the age of L2 acquisition, the amount of language usage, and the interactional setting (Grosjean, 2010). The present study tried to include as much information as possible to figure out some variables for this study. More specifically, the participants of this study acquired their second language (i.e. English) since they are 3 years old. Most of them were exposed to English language at school, their exposure of the second language is much more than their native language (i.e. Arabic). This study finds an effect from these factors on the performance of the bilinguals. In some studies, these factors were reported to affect performance; for example, Bassitti (2007) showed that Italian-German children were not significantly affected by their native Italian grammatical gender system, the study concluded that speaking two languages can affect concepts of objects as masculine or feminine. Bassitti & Nicoladis (2016) reported that effects of grammatical gender on thinking have rarely been reported for children under the age of eight years.

Another crucial factor is that some researchers (e.g. Ramos & Roberson, 2010; Vigliocco et al., 2005) found that grammatical gender effects appeared in tasks where stimuli were labeled, but not with pictures. The picture similarity task used in this study is a task where access to linguistic information and the relation between grammatical and biological gender is avoided and blocked (Almutrifi, 2015) this helped to access the concepts of the objects without retrieving their linguistic labels (Johnson, et al. 1996). The findings of this study revealed that the participants were not affected by Arabic grammatical gender system suggesting that their knowledge of their language was not taken into account while matching the pictures. The effect of this factor appeared in other studies such as Almutrifi (2015) in which the participants were not affected by the Arabic grammatical gender system in the picture similarity task (i.e. pictures used only without labels). Furthermore, this result is in agreement with the study of Boroditsky, L., Schmidt, L. A., & Phillips, W. (2003) in which they concluded that the effect of Spanish grammatical gender was more pronounced when the pictures were accompanied by their Spanish labels.

On the other hand, the results of this study refute other studies (e.g. Boroditsky & Philips, 2003) which conclude that peoples' ideas about the genders of objects can be influenced by the grammatical gender of their languages. In the current study, the participants' ideas were not influenced by the grammatical gender of Arabic language. One factor can be taken into account to explain this disagreement which is the level proficiency of the participants' two languages. Native speakers of the grammatical gender language who learnt another natural grammatical gender language at a high level are not affected by their native grammatical gender language (e.g. Sato, et al. 2013; Almutrifi, 2015). Whereas, native speakers of a grammatical gender language who learnt another grammatical gender language are affected more by the gender assignments of the language they are more fluent in (e.g. Kurinski & Sera, 2011; Philips & Boroditsky, 2003). In a study conducted by Sato, et al. (2013), the findings showed that those who are less proficient L2 were influenced by their native language, while highly proficient L2

participants resemble native speakers of the L2. The word proficiency mentioned in Philips & Boroditsky (2003) study was not clear, whether the participants' proficiency of L2 was high or not. The researchers did not mention any test for the participants' language proficiency. This suggesting that their influences of their native grammatical gender may be due to the low proficiency of their second language (i.e. English). On the contrary, the participants of the current study were early bilinguals and have mostly exposed to their second language.

The task is followed by a confidence scale to make sure that participants are sure about their matches (masculine-masculine and feminine- masculine) It showed that the similarity perception is high in masculine and feminine root in view of observation responses numbers and proportion followed by not similar, indicating that the participants were more confident when they match the picture in the first task. This confirms (Denes, 2008) who has advocated the use of confidence rating grammar (e.g. confidence scale) in order to assess whether the knowledge of objects' perception acquired is conscious or unconscious. So, the participants of the currents study were sure about what they have chosen in the 12 trails which revealed that there is no effect of grammatical gender on Arabic native children.

## **6. Recommendations**

Based on the findings of the current study, the researcher presents the following recommendations for further research:

- 1) Further research should take into consideration that variations in tasks demands and materials would lead participants to use different ways of perception in order to access their cognitive representations of objects.
- 2) The study has investigated bilingual children as one sample; further research could investigate monolingual children and compare their results with the bilingual ones.
- 3) Finally, this study investigated the effect of learning a natural gender language on bilinguals; further research could investigate the effect of gendered language like French or Spanish on Arabic speakers.

## **7. Conclusion**

In conclusion, this study has demonstrated strong evidence on the effect of grammatical gender on object perception of Arabic-English bilingual children. It shows that acquiring two languages which represent the same object differently affect bilingual children's concept of that object. To sum up, this research contributes to discussions about the relationship between though and bilingualism.

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