# GENDER ASSIGNMENT TO LEXICAL BORROWINGS BY HERITAGE SPEAKERS OF ARABIC[*]

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## 1.    Introduction

The term heritage speakers in linguistics specifies a form of early bilinguals who are commonly defined as "individuals raised in homes where a language other than English is spoken and who are to some degree bilingual in English and the heritage language." (Valdés, 2000). Note that English in Valdés' definition is just an example of a dominant language in a certain context (most of North America). By definition, children of immigrants are very often described as heritage speakers because they have some command of their first language, but they also grasp, either sequentially or simultaneously, the dominant language or the language spoken in the larger society to which they or their families have immigrated (Rothman, 2009). The linguistic outcome of such an early bilingualism varies significantly from native-like competence to very poor linguistic skills in the heritage language, showing both similarities and differences when compared to an L1 speaker or an L2 learner. This is to say that heritage speakers tend to resemble monolinguals in their exposure to a language since birth and resemble bilinguals in the attainment of two language systems. However, they differ from monolinguals in the fact that early exposure to the heritage language usually does not grant them full competency. Heritage speakers also differ from L2 speakers due to the formers' early exposure to language. Then it is only fair to say that heritage speakers' linguistic competence exhibits a continuum with native-like attainment on one end and a very limited proficiency on the other (Benmamoun, Montrul & Polinsky, 2013).

This competence is commonly discussed in the literature with regard to two main factors, language attrition and incomplete acquisition. Language attrition refers to the gradual loss of linguistic features of a native language in adulthood as a result of a reduced use of the native language paired with a massive use and exposure to another language, usually a dominant language (Schmid, 2011). More specifically, attrition means a language property had been fully acquired, and was perfectly functioning for X period of time, then started to show signs of deficiency. Incomplete acquisition, or "divergent grammar", on the other hand, refers to linguistic difficulties that are attributed to insufficient input during childhood, or before the full development of a linguistic system (Benmamoun, et al. 2013, p. 278).

Several studies on heritage speakers' grammar suggest that attrition and/ or incomplete acquisition is evident in a wide range of linguistic areas e.g. phonology (Lukyanchenko & Gor, 2011), relative clauses (Polinsky, 2011), tense aspect and modality (Montrul, 2002), and that gender agreement morphology is no exception (Anderson, 1999). As far as this paper is concerned, studies that investigate grammatical features of Arabic as a heritage language, where English is a dominant language, indicate that gender agreement morphology was one of the areas in grammar where heritage speakers seemed to have difficulties. (Albirini et al., 2011; Albirini & Benmamoun, 2012; Albirini et al., 2013; Aldajan, 2014). More specifically, noun-adjective

agreement morphology was found to be more susceptible to attrition than subject-verb morphology in Arabic heritage speakers' oral production (Albirini et al., 2013; Aldajan, 2014).

Although previous studies have found vulnerability in the expression of gender in the nominal domain of heritage speakers of Arabic (Albirini et al., 2011; Albirini et al. 2013; Aldajan, 2014), they do not specify whether the problems come from gender assignment or gender agreement. Some studies on the assignment of gender to lexical borrowings in monolingual Arabic speakers have shown that they rely on (morpho)-phonological cues to determine the gender of a new noun (Mustafawi, 2002; Moshref, 2010; AL-Saidat, 2011). Here, we investigate gender assignment to lexical borrowings by Arabic heritage speakers to determine the patterns that heritage speakers follow when assigning gender to loanwords and to find out whether this group of speakers differs in their mechanisms of assigning gender compared to monolingually raised native speakers. To the best of our knowledge, the very few previous studies that have investigated gender in Arabic as a heritage language have focused on gender agreement (Albirini et al., 2011, and Albirini et al. 2013). In turn, this study hopes to take the discussion one step further by investigating gender assignment. We begin with an outline of the Arabic gender system and illustrate gender agreement in nominal structures with both demonstratives and adjectives. We then introduce our criteria of lexical borrowings and survey previously suggested accounts for assigning gender to loanwords, after which we survey research on gender agreement morphology in L1 acquisition, heritage languages, and gender assignment to lexical borrowings. That is followed by the three research questions deriving this study, our methodology, qualitative and quantitative analysis of the variables. We then discuss the findings to answer our research questions linking them to the literature. Finally, we present the main conclusions of the study.

## 2. Linguistic Phenomena

### 2.1. An Outline of the Arabic Gender System in Singular Nouns

Arabic distinguishes two grammatical genders: masculine and feminine, and the masculine gender is considered the simplest form in singular nouns, as it is not marked. However, singular feminine nouns are overtly marked by the suffix [-a(t)], called *ta:ʔ marbu:tˤa* in Arabic, and which is pronounced as [-a] in pause form[1]. The examples in (1) are animate nouns, which are assigned gender based on the referent's sex[2].

(1)

|  | Masculine | Feminine |
|---|---|---|
| 'a worker' | ʕa:mil | ʕa:mil-**a** |
| 'a baby' | tˤifl | tˤifl-**a** |
| 'a doctor' | tˤabi:b | tˤabi:b-**a** |
| 'a dog' | kalb | kalb-**a** |

Gender classification is also present in inanimate nouns, in which gender assignment is arbitrary. As in animate nouns, singular masculine inanimate nouns do not have any gender marker. Inanimate singular feminine nouns, on the other hand, can be categorized into canonical and noncanonical based on whether they possess or lack the feminine marker; feminine nouns

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[1] [-a] will be used in this paper as it is the most common representation of the feminine marker in the literature on the Arabic gender system. Other forms of feminine markers are presented at the end of this paper.
[2] Few exceptions to the rule include masculine proper names that end in [-a] e.g. *osama*, *ħamza*, and *qʕaswara*.

that present the marker [-a] are considered canonical (2), whereas feminine nouns without any marker are considered noncanonical (3).

(2) Canonical feminine nouns
     a. luʕb-**a**       'a toy'
     b. qitˤtˤ-**a**      'a female cat'

(3) Noncanonical feminine nouns
     a. misʕr  'Egypt'
     b. ʃams  'a sun'

As demonstrated in (3), some feminine nouns lack the feminine marker [-a], the
noncanonical feminine nouns, and meaning that their gender has to be learned or memorized. Fortunately, these noncanonical feminine nouns are few in the language. That is, the general rule for gender assignment in Arabic remains morphological for inanimate nouns. The focus of this study is on inanimate singular nouns. Animate and plural nouns cannot be given adequate attention in this study because number and animacy (humanness)[3] have different gender assignment and agreement rules (see Albirini & Benmamoun, 2014; Aldajan, 2014; Benmamoun, Albirini, Montrul & Saadah, 2014).

     In a nutshell, Arabic animate nouns are assigned to gender based on semantic rules whereas inanimate nouns follow formal rules, morphophonological rules. All inanimate nouns that end in [-a] are grammatically feminine, with no exception[4] (Ibrahim, 1973, p. 79). Nouns that lack feminine markers are considered linguistically masculine, unless they have been treated as feminine nouns by convention, which can only be evident within a constituent, by agreement[5]. The next section illustrates gender agreement with inanimate singular nouns.

## 2.2. Gender Agreement

In Arabic nominal sentences or noun phrases, gender concord/ agreement occurs among nouns, demonstratives and adjectives. The sentences in (4a), (4b) and (4c) are examples of demonstratives agreeing in gender with the nouns they precede. Note that the masculine form of the demonstrative agreeing with the masculine noun is *haða* which should not be confused for a feminine gender marker [-a], demonstrated in (4a). As shown in (4b) and (4c), the canonical feminine noun *luʕb-a* 'toy' and the noncanonical feminine noun *ʃams* 'sun' take the feminine form of the demonstrative *haðihi* 'this'.

(4)    a.    haða ba:b
              DET.this        MAS.door.MAS.
              'this is a door'

        b.    haðihi        luʕb-a
              DET.this.FEM.   toy.FEM.
              'this is a toy'

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[3] Humanness is mentioned here because it is the actual base on which Arabic nouns are categorized, rather than animacy.

[4] Some masculine nouns end with an [-a] or [-aʔ] as original parts of the lexical root and not as affixes or a feminine marker e.g. *maʕna* 'meaning' and *ʁinaʔ* 'singing'.

[5] Some noncanonical feminine nouns show the gender marker in their dominative form, e.g. ʕain 'eye.FEM.' ʕujajn-**a**.

    c.      haðihi        ʃams
           DET.this.FEM.   sun.FEM.
           'this is a sun'

Note that grammatical gender is not manifested in the Arabic definite article *al*; as such demonstratives and adjectives were the best fit through which we could investigate grammatical gender. For example, in (5a), (5b) and (5c), the adjective *kabi:r* 'big' agrees in gender with the nouns it is qualifying: masculine, canonical feminine and noncanonical feminine, respectively.

(5)   a.      ba:b        kabi:r
             door.MAS.   ADJ.big.MAS.
             'a big door'

       b.      luʕb-a      kabi:r-a
             toy.FEM.    ADJ.big.FEM.
             'a big toy'

       c.      ʃams        kabi:r-a
             sun.FEM.   ADJ.big.FEM.
             'a big sun'

Since nouns require adjectival agreement at the NP level (Albirini et al., 2013), the adjective 'big' in (5a), (5b) and (5c), agrees in gender with the nouns it is qualifying. And it is only through gender concord/ agreement on the demonstrative as in (4c) and/or on the adjective as in (5c) that we can tell that the noun ʃams 'sun' is feminine.

## 2.3.  Lexical Borrowings

Arabic is no exception to the process of language borrowing, and loanwords borrowed into Arabic were chiefly from Greek, Persian, and Turkish, such as *fajlasu:f* 'philosopher', *bitˤaqˤa* 'piece of paper or ticket', *fihrist* 'index'. More recent borrowings, however, come from English and French "to a lesser degree" primarily to fill a lexical gap in the fields of science and technology (Holes, 2004; Versteegh & Eid, 2006). The term *borrowing*, in a broad sense, is defined as the "linguistic forms being taken over by one language or dialect from another" (Crystal, 2003, p. 56). Adopting Crystal's definition in our study might be challenged by the diglossic situation of Arabic, as this study is concerned with lexical items that are borrowed into Arabic from other languages, mainly English and French. A more precise definition for borrowings into Arabic could be "solid-stem words, not analyzable into roots and patterns" and these words are "...incorporated from other languages..." (Ryding, 2005, p. 95) which adheres to the nature of word formation in Arabic, and as such provides a more accurate gauge for lexical borrowings compared to other definitions. For the purpose of this study, however, we find it necessary to make it clear that by using the term borrowing we refer to recurrent and widespread foreign words used regularly by monolinguals and which might have been integrated to some level into the phonological patterns of the recipient language, but crucially, are not phonologically or morphologically adapted to the Arabic gender assignment rules. We adopted this criterion while deciding which loanwords to include in the study. For instance, the lexical borrowing *ʃukula:ta* 'chocolate' was not used in the tasks because its phonological adaptation to Arabic included the insertion of the gender marker [-a]. The word *aıba:d* 'iPad', on the other hand, appeared in the tasks because its phonological adaptation did not involve any overt gender marker. As a result, our criteria entail that lexical borrowings, such as data, villa, and vanilla,

whose [-a] ending is original (meaning it is not a result of adaptation to Arabic), are included in the study.

Once a lexical borrowing is integrated into a language with a gender system, it is automatically assigned a gender by the speakers of that language. In one of the most cited references on the topic of gender, Corbett states, "As new nouns are borrowed into a language they must be given a gender and this allows us to see the assignment rules operating on material which is something unlike that of the native vocabulary." (1991, p. 70). Corbett emphasizes the great evidence that gender assignment to lexical borrowings can provide in determining a gender system of a given language, especially when hypothesizing that lexical borrowings are assigned to gender based on the same assignment rules of the recipient language. The question as to what mechanisms do native speakers of Arabic employ in their assigning gender to lexical borrowings has been discussed in a number of studies (Mustafawi, 2002; Versteegh & Eid, 2006; Moshref, 2010; AL-Saidat, 2011), all of which have observed a tendency to rely on the (morpho)-phonological ending of the borrowed items. That is, as a general rule, lexical items ending in [-a] are to be assigned the feminine gender, while lexical borrowings that lack the [-a] ending are assigned the masculine gender by native speakers of Arabic. The purpose of this study is to compare heritage speakers' performance in assigning gender to loanwords with that of monolingually raised Arabic speakers and to test whether heritage speakers are as sensitive to the morphophonological cues as are the native speakers.

## 3. Literature Review

### 3.1. Gender Agreement Morphology in L1 Acquisition

Studies on first language acquisition of gender systems seem to agree that three year old children have no difficulty with gender agreement morphology in nominal structures, and that by the age of four children demonstrate a mastery of this linguistic property, with very few errors (Omar, 1973, for Arabic; Berman, 1981, for Hebrew; Karmiloff-Smith, 1978, Karmiloff-Smith, 1979; Kupisch, Müller & Cantone, 2002, for French; Pérez-Pereira, 1991, for Spanish; Kupisch et al., 2002, for Italian). In the most cited study on Arabic as an L1, Omar (1973) observes, among other features, the agreement morphology in verbal and adjectival structures of thirty one Egyptian children and discerns that the default singular masculine form tends to be overgeneralized in the children's naturalistic utterance, which seems to support the account that regards the masculine gender as the unmarked. With respect to gender, the notion of markedness seems to be associated with complexity; unmarked forms are less complex than marked ones and this implies that unmarked items are often easier to acquire for first language acquirers (Greenberg, 1966; Mills, 1986). Therefore, since the feminine form is the only one that can take a gender marker in Arabic, the masculine gender is considered the unmarked form.

### 3.2. Gender Agreement in Heritage Languages

Despite what has been documented in first language acquisition on age of acquiring grammatical gender, research on heritage languages that are in contact with English, a language that generally does not mark gender in nouns and adjectives, suggests that gender agreement morphology is a vulnerable area in the grammar, showing signs of attrition and/or incomplete acquisition in different languages (Albirini et al., 2011; Albirini et al., 2013, for Arabic; Anderson, 1999, 2001; Montrul, Foot & Perpiñán, 2008, for Spanish; Polinsky, 2008, for Russian). Commonly cited evidence demonstrating both attrition and incomplete acquisition is a longitudinal study by Anderson (1999, 2001) on two Spanish speaking siblings with two and four years as their ages of arrival in the United States, and who showed different patterns in their development of gender agreement morphology, tense and mood in Spanish; the older child exhibited a case of attrition as

she had native monolingual fluency at first, then that fluency seemed to be marred with increasing errors. The youngest one, however, seemed to present a case of incomplete acquisition due to her exposure to the dominant language (English) before her full attainment of the linguistic properties of Spanish, which normally occurs at the age of three among native monolingual children. Polinsky's data (2008) on Russian heritage speakers dominant in English show a reanalysis of the gender system. Specifically, low proficient heritage speakers of Russian demonstrated a gender system reduced from three genders, masculine, feminine and neuter, to two genders, which Polinsky interprets as a sign of incomplete acquisition rather than attrition. This interpretation was supported by results from Russian heritage speakers with higher proficiency, in the same study, and which showed maintenance of the three-gender system. Research on Arabic as a heritage language indicates similar vulnerability in the speakers' knowledge of inflectional morphology both in nominal and verbal agreement. Albirini et al. (2011) used two elicited production tasks to investigate nominal and verbal agreement morphology among other syntactic and morphological features in the oral production of Egyptian and Palestinian heritage speakers, and the findings indicated a great tendency by the two groups of heritage speakers to overgeneralize the third singular masculine person. A similar tendency was observed in Albirini et al. (2013), which compared heritage speakers' knowledge of agreement morphology in subject-verb constructions with that in noun-adjective. The study involved two oral production tasks, one elicited narrative while the other was a picture description task, and results from both tasks indicated that nominal agreement morphology was more problematic for heritage speakers than verbal agreement morphology with a correct response rate of 63.92% and 82.78%, respectively. Furthermore, the overgeneralization of the singular masculine form shaped 42.11% of the errors in verbal agreement morphology and 66.67% of the errors in nominal agreement morphology, in the oral narrative task, which again reinforces the notion of "the singular masculine form being unmarked in the acquisition of (Arabic) inflectional morphology" (Albirini et al., 2013).

Although it is hard to tease gender assignment apart from gender agreement, gender assignment is often tested through agreement with determiners, assuming that the error of a mismatching determiner in gender with a noun (e.g. *haðihi kursi 'this.FEM chair.MAS') is caused by not knowing the correct gender of a given noun, and thus it is interpreted as an assignment/lexical error. Gender agreement, on the other hand, is often examined through agreement with adjectives, and accordingly, an error of a mismatching adjective with a given noun (e.g. *kursi kabi:ra 'chair.MAS big.FEM') is considered an agreement/ syntactic error. This distinction between gender agreement on adjectives and that on determiners is based on the belief that gender agreement on determiners only requires possessing the correct gender of a given noun, while gender agreement on adjectives also requires the retrieval of the correct adjective (Dewaele & Veronique, 2001; Montrul & Potowski, 2007; Konta, 2012). Since the previous studies of Arabic as a heritage language (Albirini, et al., 2011; Albirini, et al., 2013) focus on gender agreement in Arabic words, we do not have data on how grammatical gender is assigned to loanwords by heritage speakers. Accordingly, in this study, we aim on tapping in gender assignment to loanwords and observe any similarities and/or differences between heritage speakers and their monolingually-raised counterparts in this domain.

## 3.3. Gender Assignment to Lexical Borrowings

Several suggestions have been proposed to account for the process in which gender is assigned to loanwords, the majority of which seem to agree on lexical borrowings being assigned gender according to biological sex if they denote animates (Ibrahim, 1973; Corbett, 1991). This notion is not further investigated in our study, which deals exclusively with inanimates because grammatical gender in inanimates does not affect their meanings, and does not have any semantic implications (Ibrahim, 1973, p. 25). With regard to the rules of assigning gender to loanwords, Haugen (1950) suggests that by default, loanwords are assigned to one particular gender in any

given language, "unless specific analogies intervene to draw them into other classes". In other words, according to Haugen, in the absence of typological similarities, all loanwords tend to be assigned to one gender, in the recipient language, regardless of whether this gender is the masculine, the feminine, or the neuter, etc. Ibrahim (1973) and Corbett (1991) maintain that the process of gender assignment to loanwords respects the same rules used in assigning gender to native words. This is to say that loanwords are automatically given a gender by the native speakers of a borrowing language in accordance with the assignment rules of that language, a phenomenon that has been described as "...a continuously running experiment, which allows us to verify the assignment system in the languages in question" (Corbett, 1991, p. 71).

A number of studies investigated gender assignment to loanwords by Arabic native speakers. For example, Mustafawi, (2002) examined loanwords occurring in naturalistic data from seven native speakers of "Gulf Arabic" and reported that "English-origin nouns" were assigned gender based on the "final phonetic sound" of the words and that sound's resemblance to the gender marker in Arabic. That is, if the final segment of a loanword is interpreted as the feminine gender marker in Arabic, [-a], speakers of the borrowing language assign the feminine gender to that loanword. Similar results were found by Moshref (2010) who examined the grammatical gender of 93 French and English loanwords occurring in Egyptian movies and reported the major effect of the (morpho)-phonological ending of the loanwords, as explained earlier. Moshref (2010) further asserts that not all loanwords that are assigned the feminine marker originally ended in [-a]; rather, some loanwords that were assigned the feminine gender were phonologically adapted by adding the [-a] ending. The major (morpho)-phonological effect remains robust in Al-Saidat (2011) who analyzes naturalistic data in Jordanian Arabic and shows that (morpho)-phonological ending is the primary factor in establishing the gender of lexical borrowings. Investigating the factors that could affect gender assignment, Moshref (2010) argues that the default gender has a minimal effect compared to the role of (morpho)-phonological principles.

Assuming that gender assignment to loanwords is a process that occurs across Arabic dialects, in this study, we investigate gender assignment to lexical borrowings by Arabic heritage speakers to find out whether this group of speakers differ in their mechanisms to assign gender to borrowings compared to native speakers, and determine the patterns that heritage speakers follow when assigning gender to loanwords. While doing so, we further investigate the role of the morphophonological principle as well as markedness (the assumed default masculine in Arabic). To the best of our knowledge, no other study in the literature has investigated heritage speakers' performance on gender assignment to loanwords and compared it to that of monolingually raised speakers'. Therefore, in this study, we attempt to answer the following questions:

1. Will heritage speakers differ from the control group in assigning grammatical gender to loanwords that denote objects?
2. Will heritage speakers be as sensitive to the morphophonological markers in loanwords as native speakers are?
3. What patterns can be detected in the performance of the heritage speakers in assigning gender to loanwords?

Although first language acquisition research suggests that grammatical gender in Arabic is acquired around the age of three (Omar, 1973), and that errors in gender agreement are very rare by the age of four, noun-adjective agreement morphology has been described as one of the areas that is susceptible to attrition and/or incomplete acquisition in research on Arabic heritage speakers (Albirini et al., 2011; Albirini et al., 2013). Assuming that heritage speakers who arrived in Canada after the age of four have already mastered grammatical gender in their language before the massive exposure to their second language, English, and thus, they possess the same mechanisms of gender assignment as that of monolingually raised speakers. This implies that grammatical gender in heritage speakers who arrive in Canada before the age of four might not be characterized as fully developed and which may have an effect on the mechanisms used in gender assignment. Therefore, we predict to observe a positive correlation between heritage

speakers' age of immigration to Canada and the similarity of their performance to that of the native controls.

There are two possible scenarios /predictions with regard to the performance of the heritage speakers on assigning gender to loanwords. The first is that, if the heritage speakers apply the same mechanisms used by the native controls when assigning gender to loanwords, then we will observe a level of sensitivity or reliance on the morphophonological cues. In other words, in this case, heritage speakers will assign the feminine gender to all loanwords ending in [-a]. As mentioned earlier, research on assigning gender to loanwords denoting inanimates demonstrates that Arabic native speakers rely predominantly on (morpho)-phonological cues (Mustafawi, 2002; Moshref, 2010; AL-Saidat, 2011). The second possibility is that, if the mechanisms used by heritage speakers to assign grammatical gender to loanwords are different than that used by the native controls, we predict that the default gender, the masculine gender, will come into play. In this case, heritage speakers will assign the masculine gender to all loanwords regardless of their morphophonological endings. This possibility is based on previous research on nominal gender agreement, which found a great tendency towards overgeneralizing the masculine gender by Arabic heritage speakers (Albirini et al., 2011; Albirini et al., 2013).

## 4.    Methodology

### 4.1.  Participants

This study involved three groups of native speakers of Arabic: 1) the control group including eight monolingually raised Arabic native speakers, 2) the first group of heritage speakers (HS1), consisting of seven early bilinguals or simultaneous bilinguals who were either born in Canada or arrived at the age of four year-old or younger with a mean length of residency of 17.6 years (range: 15-19) and mean age of arrival 2.7 years, and 3) the second group of heritage speakers (HS2) including eight bilinguals who arrived in Canada after the age of four with a mean length of residency of 10.3 years (range: 7-13) and mean age of arrival 11.2 years. All participants completed a linguistic background questionnaire, according to which they were divided into the three groups.

The HS1 group consisted of two males and five females, six of whom were undergraduate students and one was a graduate student at Western University during the collection of the data. Two of the HS1 participants were born in Canada, two arrived at the age of 1 year-old, and three arrived at the ages of four, six and seven. The two participants who arrived in Canada at the ages of six and seven indicated being enrolled in International kindergarten and elementary school in their home countries, were English was the language of instruction, and thus they were considered early or simultaneous bilinguals. Those who were not born in Canada were born in Arabic speaking countries, including Jordan, Lebanon, Libya, Sudan, and Syria. All participants reported Arabic as a language that they use with their parents. Only two indicated that they use Arabic with their siblings. All participants in this group, except for two, reported Arabic as their first language, whereas two participants reported English. Four participants were enrolled in Arabic classes for beginners, while three reported going to Sunday school during elementary and high school. According to self-report, and presented with four options (proficient, good, limited, and unable to communicate), one participant indicated being equally proficient in both English and Arabic, two reported good command of the Arabic language and four reported limited communication skills. All participants in this group reported their abilities to read Arabic scripts. As for their proficiency levels in English, all participants reported being proficient.

The HS2 group consisted of five males and three females all of whom were undergraduate students at Western University during data collection. All participants but one were born in Arabic speaking countries, including Jordan, Lebanon, Palestine and Syria. One participant was born in Canada but went back to his home country at the age of one year-old for over nine years,

and accordingly was assigned to this group. The same case applies to two participants who arrived in Canada at the ages of one and two but moved around the ages of six and seven to their home countries for nine years before they came back to Canada again. All participants in this group reported Arabic as their first language and as the language they predominantly use at home with their parents and siblings. A summary of demographic data is shown in Table 1.

Table 1: Summary of participants' demographic data (SD)

|  | Control | Heritage Speakers 1 | Heritage Speakers 2 |
|---|---|---|---|
| Number | 8 '1 male' | 7 '2 males' | 8 '5 males' |
| Mean age | 26.1 (8.6) | 20.3 (2.4) | 20 (1.6) |
| Mean age of arrival | 22.3 (7.7) | 2.7 (2.9) | 11.2 (3.3) |
| Mean period of residency in Canada | 3.9 (2.2) | 17.6 (1.8) | 10.3 (2.3) |
| Language use at home | Arabic | Arabic & English | Arabic |
| Language use with parents | Arabic | Arabic & English | Arabic |
| Language use with siblings | Arabic | Arabic & English | Arabic & English |

The control group consisted of eight participants, one male and seven females, from Arabic speaking countries, including Egypt, Jordan, Saudi Arabia, Syria and United Arab Emirates (mean age of arrival 22 years). During this study, four participants were graduate students and four were undergraduates, and their mean period of residency in Canada was 3.9 years. All control participants were international students at Western University and regarded English as their second language reporting native command in Arabic.

## 4.2. Materials

### 4.2.1. A Linguistic Background Questionnaire

For this study, a language background questionnaire was designed to reflect the participants' self-evaluation of their linguistic competence and demographic information (age, education, spoken dialects at home, language use with parents, siblings, and social circles, etc.) Participants could choose between Arabic and English for the language of the questionnaire, and all but one participant chose English. (See Appendix A)

### 4.2.2. Elicited Production Task (oral)

The purpose of this task was to investigate heritage speakers' performance on gender assignment and agreement in simple nominal structures. The stimuli consisted of a series of twenty labeled pictures of loanwords denoting inanimate entities, such as a computer. While conducting this study we found that loanwords that originally end in [-a] are considerably fewer than loanwords with other endings. The total number of words ending in [-a] was eight, and so was divided on the oral production task and the grammaticality judgment task, four in each. The four loanwords ending in [-a] in this task are cinema, mascara, cola, and pizza. We avoided incorporating any plural nouns in the study to avoid cases of broken plural, which entails certain changes in gender agreement with adjectives and pronouns (See Albirini & Benmamoun, 2014; Aldajan, 2014).

كيبورد

Figure 1: Example from the Elicited Production Task. ('Keyboard' in Arabic orthography)

Pictures of 20 singular Arabic nouns were used as distractors (10 singular masculine nouns, and 10 singular feminine nouns, including five canonical and five noncanonical feminine nouns). In an attempt to overcome the possible effect of dialectal variation, all slides were labeled using Arabic orthography as Figure (1) shows. To the best of our knowledge, there was no reference to check the frequency of the loanwords that were used in the tasks; however, every logical effort was made to insure that the nouns were familiar and commonly used in most Arabic speaking countries. One way to overcome this challenge was presenting a clear picture demonstrating each noun used in the task. Participants were instructed to create sentences using the target nouns including a determiner and an adjective.

Upon the presentation of each slide, the participant could see the picture and the noun that appeared on the slide typed in Arabic. Following the instructions, he/she would ideally respond with a sentence similar to the ones provided as the model in (6). If the participant's sentence was similar to the one in (6a), it indicates that the participant assigned the masculine gender to the target word, keyboard. And if the participant's response resembled the model in (6b), this means that he/she regarded the target word, keyboard, as feminine. Other possible responses will be discussed in the results section.

(6)  a.  haða        keyboard  kabi:r
         DET.this.MAS.   keyboard  ADJ.big.MAS.
         'this is a big keyboard'

     b.  haðihi       keyboard  kabi:ra
         DET.this.FEM.   keyboard  ADJ.big.FEM.
          'this is a big keyboard'

All participants had to practice on an extra slide before the actual recording started. All responses were audio recorded, coded and transcribed for analysis. See appendix B for a list of the lexical borrowings included in this task.

### 4.2.3.  Grammaticality Judgement Task

The purpose of this task was to collect data on gender assignment and agreement to loanwords through the speakers' grammatical intuitions. The stimulus of this task contained sixteen loanwords denoting objects, four of which ended in [-a] (*data, drama, vanilla* and *villa*). Each loanword was presented in two conditions, once with a demonstrative in the masculine form, and another with a demonstrative in the feminine form, as shown in example (7).

(7)  a.  haða         laptop
         DET.this.MAS.   laptop
         'this is a laptop'

b. haðihi laptop

DET.this.FEM. laptop

The phrases were recorded by a female native speaker with a standard accent. Then recorded phrases were pseudo-randomized to insure that none of the nouns belonging to the same category appeared sequentially. Participants were given a sheet of paper and were instructed to mark their responses upon hearing each noun phrase. They had two options to choose from, either Good or Bad. Participants were monitored by a researcher to insure that they were responding to the phrases in the appropriate order. Twenty singular nouns of inanimate objects, including 10 masculine nouns, and 10 feminine nouns (five canonical and five noncanonical) were included as distractors in this task. The items used in this task are different than the ones in the previous task. A set of five extra noun phrases was played first as an exercise to insure that participants would respond according to the task's instructions. Appendix C is a list of the loanwords used in this task.

### 4.2.4. Gender Assignment Task

This task was prepared to collect the participants' metalinguistic gender assignment to loanwords. A list of all loanwords included in the two experimental tasks was made and read out loud by the experimenter and the participants were asked to explicitly indicate what gender they would give to each item. Participants were presented with the following instructions: "I would like you to listen to each of the following words and tell me whether you think or feel that it is masculine or feminine. There is no right or wrong response, all I need is your personal intuition about it" After that, the participants were asked about the methods they used or based their decisions on while deciding the gender of the words. The researcher recorded the participants' responses by hand for analysis.

### 4.2.4. A Translation Task

The purpose of this task was to collect data about the participants' dialectal variation with regard to the use of loanwords. A list of all the loanwords that appeared in the other tasks was made and read out loud by the researcher. The participants then were asked to provide any Arabic words/ translations they would recognize or use as equivalents for the borrowed items. The researcher recorded the participants' responses by hand for analysis.

### 4.3. Procedure

This study involved five tasks: a Linguistic Background Questionnaire, an Elicited Oral Production Task, a Grammaticality Judgment Task, a Gender Assignment Task, and a Translation Task, in that order. All tasks were untimed and were completed in the same order by all participants individually in a quiet study room on campus. The completion of all tasks took approximately 35 minutes. All participants received monetary compensation in exchange for their participation in the study.

### 5. Results

### 5.1. Results of Elicited Production Task

Correct responses to this task consisted of all phrases that have a determiner and an adjective agreeing in gender regardless of the word ending. Each correct response received 1, and each incorrect response received 0. The counts and overall percentages of frequency for each group

were calculated, as seen in Table 2. It has to be noted that the number of total production is different across groups because of two reasons; the number of participants in each group is different, and the incorrect responses are separately analyzed.

Table 2: Counts and percentages of correct responses in Elicited Production Task N (%)

|  | Masculine | Feminine | Total |
|---|---|---|---|
| HS1 (N=7) | 114 (85.7) | 19 (14.3) | 133 (100) |
| HS2 (N=8) | 97 (65.1) | 52 (34.9) | 149 (100) |
| Control (N=8) | 123 (76.9) | 37 (23.1) | 160 (100) |

The control group regarded the majority of the lexical borrowings presented in this task as masculine, 76.9%, rather than feminine, 23.1%. Results from HS1 reflect a similar tendency as 85.7% of the lexical items were treated as masculine and only 14.3% had feminine agreement. The HS2 results indicate the same tendency, yet to a lesser degree than the control and the HS1 groups.

HS2 treated 65.1% of the loanwords as masculine and 34.9% as feminine. In general, the higher percentages of loanwords seem to be treated as masculine by speakers from all groups. In order to investigate the effect of the morphophonological ending, the total results from the four target slides with borrowings ending in [-a] were analyzed separately per group, as shown in Table 3.

Table 3: Counts and percentages of correct responses to borrowing with [-a] ending in Elicited Production Task per group N (%)

|  | Masculine | Feminine | Total |
|---|---|---|---|
| HS1 (N=7) | 16 (57) | 12 (43) | 28 (100) |
| HS2 (N=8) | 7 (24) | 22 (76) | 29 (100) |
| Control (N=8) | 1 (3) | 31 (97) | 32 (100) |

Table 3 shows the results based on the word's ending, the control groups treated almost all of the borrowed items that ended in [-a] as feminine, 97%, which indicates the native controls' reliance on the morphophonological endings of the loanwords. Relatively similar results were obtained from the HS2 participants, who treated 76% of the borrowings ending in [-a] as feminine and only 24% as masculine. Results from the HS1 group, however, suggest lesser sensitivity or no sensitivity to the loanwords' endings as 57% of the items ending in [-a] were treated as masculine and 43% as feminine.

The errors in the Oral Production Task were analyzed and classified into three categories: a determiner in the masculine form with an adjective that is marked for feminine, a determiner in the feminine form with an adjective that agrees with a masculine noun, and finally, a masculine form of the determiner but with no adjective. These types of errors are demonstrated in examples (8a), (8b), and (8c).

(8)  a.  * haða           iPhone     dʒadi:da
          DET.this.MAS.   iPhone     ADJ.new.FEM.
          'this is a new iPhone'

     b.  * haðihi          keyboard dʒadi:d
          DET.this.FEM.    keyboard ADJ.new.MAS.
          'this is a new keyboard'

c.  * haða            computer
    DET.this.MAS.    computer
    'this is a computer'

The example in (8a) demonstrates the first type of gender agreement error, (a determiner in the masculine form with an adjective that is marked for feminine). The second type of error was the use of a determiner in its feminine form with an adjective that agrees in gender with a masculine noun, example (8b). Finally, the example in (8c) is considered an error although a missing adjective in a sentence like the one in (8c) is not grammatically problematic. Rather it is considered an error because it demonstrates a problem in the participants' responses to the task. Counts and percentages of errors are displayed in Table 4.

Table 4: Counts and frequency of errors in Elicited Production Task per type and group (%)

|  | *MAS DET/ FEM ADJ | *FEM DET/ MAS ADJ | *MAS DET/ missing ADJ | Total |
|---|---|---|---|---|
| HS1 (N=7) | 0 (0) | 2 (29) | 5 (71) | 7 (100) |
| HS2 (N=8) | 10 (91) | 0 (0) | 1 (9) | 11 (100) |
| Control (N=8) | 0 (0) | 0 (0) | 0 (0) | 0 (0) |

As shown in Table 4, the control group had no difficulty in responding to all of the target slides in this task, consistently producing phrases that contained determiners and adjectives that agree in gender. On the other hand, participants from both HS1 and HS2 had a few errors. Prorating the total numbers of errors with the number of participants in each group shows that both groups seem to have similar numbers of errors per participant. However, the two heritage groups differ in terms of error type. Results from the HS1 suggest a struggle in producing adjectives (71% of the errors), which could be due to lack of vocabulary or insufficient input. It the responses of one participant. Accordingly, this kind of error is not a pattern or a tendency by the HS1 group. Errors by HS2 participants, on the other hand, were mainly in producing masculine determiner with feminine adjectives, 91%. The ten errors of mismatching determiners with adjectives were distributed among three participants from the HS2 group.

We investigated gender assignment to loanwords in this task by analyzing the gender of determiners assuming that gender assignment is manifested in determiners more than adjectives. Each masculine determiner was coded as 1 and each feminine determiner was coded as 2. Individuals' results for the mean assignment rates by type of word ending are presented in Figure 2.
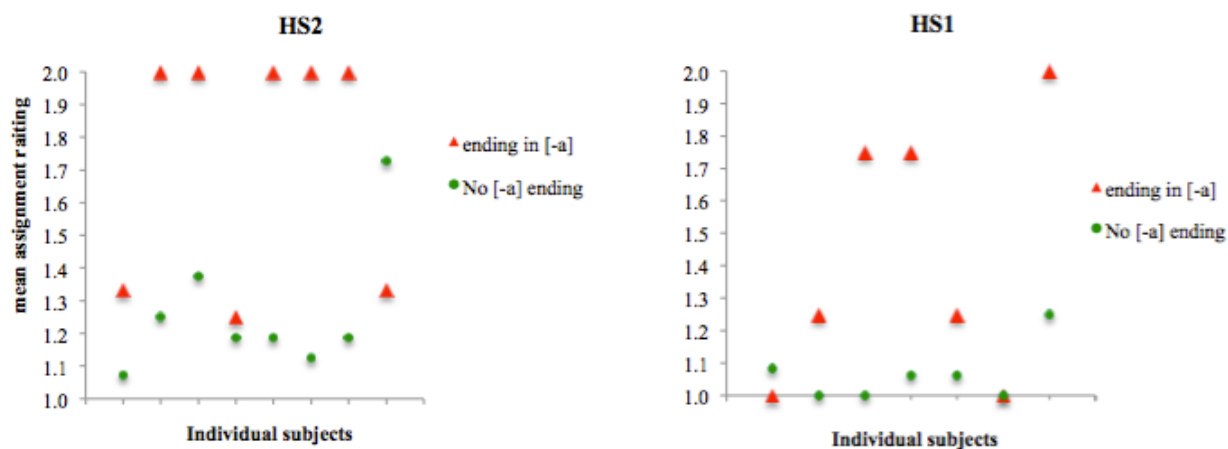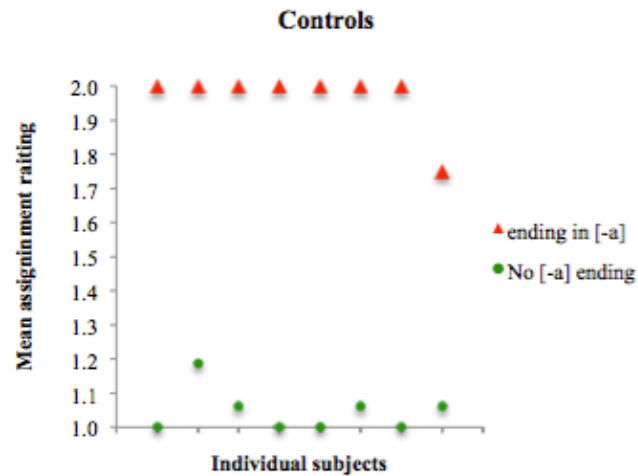
Figure 2: Individual results for Elicited Production Task: Mean assignment rates by word ending (1 = Masculine, 2 = Feminine)

As shown in Figure 2, the individual results provide a clear comparison across the groups, with 1 representing the assignment of the masculine gender and 2 the assignment of the feminine gender. While the majority of the native controls tended to have similar performance on assigning gender to the borrowed items and clearly respecting a morphophonological rule, the HS1 group showed a considerable variability among its participants. Most participants from the HS2 group, who have a shorter mean length of residency in Canada, demonstrated a slightly better performance in abiding by the word-ending rule. However, participants from the HS1 group seemed to perform in line with the controls with regard to assigning gender to the loanwords that do not end in [-a]. This tendency was also present in the performance of the HS2 participants, but to a lesser degree.

## 5.2. Results of Grammaticality Judgment Task

All participants responded to all items in this task. While all native controls expressed their preference that the phrases appear at a faster pace, most heritage speakers indicated that they found the task a little too fast and that they could have done better if they had had enough time to think before they made their judgments. Data from one participant in HS2 was discarded because the participant was considered an outlier; the participant was choosing one option continuously during the whole task. See Figure 3 below for a summary of mean results and standard deviation. Generally, results from HS2 indicate a more accurate judgment than HS1, especially when rejecting phrases or making the 'sounds bad' judgment (assuming that accuracy is measured by comparing the results with the native controls' results).
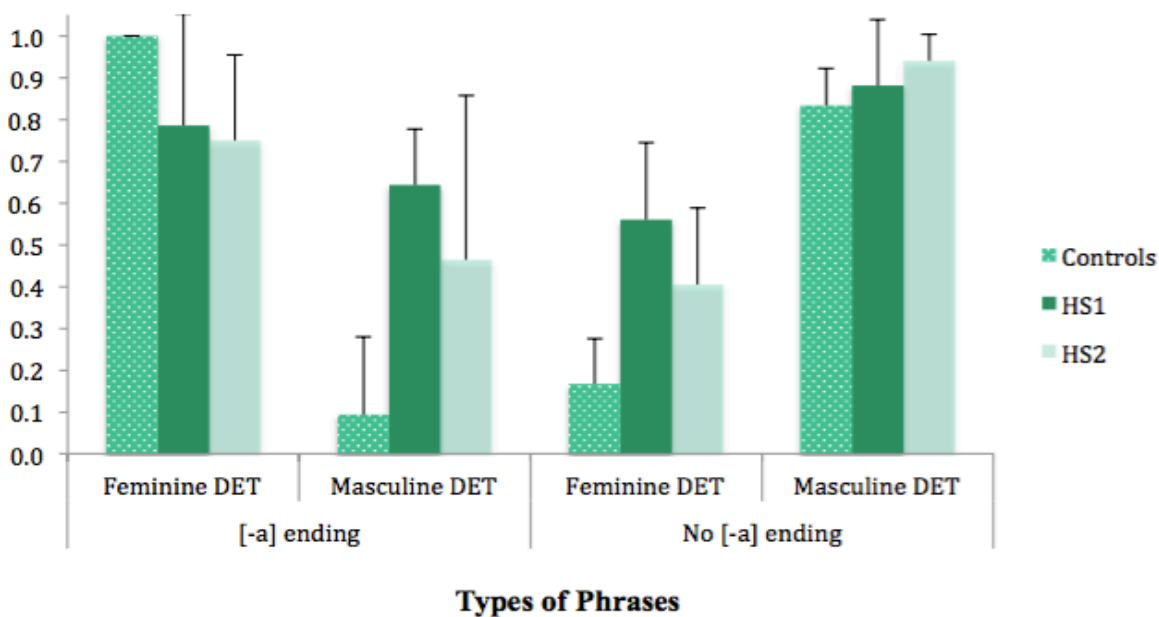
**Types of Phrases**

Figure 3: Mean acceptability rates for GJT (1= 'sounds good'; 0='sounds bad')

As for the group results, both HS1 and HS2 differ from the control group in accepting borrowings ending in [-a] especially when the borrowed items where combined with the masculine determiner. Individuals in the control group seemed to have clear intuitions regarding the gender assigned to the lexical borrowings; almost all control participants accepted phrases that contained items ending in [-a] that were combined with the feminine determiner (M = 1.00; SD = 0.00), and rejected the phrases that contained the same lexical items when they appeared with the masculine determiner (M = 0.09; SD = 0.19). On the other hand, both groups of the heritage speakers seemed to accept the same phrases (the ones that contained loanwords ending in [-a] with the feminine determiner) but less frequently compared to the native controls (M = 0.79; SD = 0.27) for HS1, (M = 0.75; SD = 0.20) for HS2, which could indicate some level of sensitivity to the same cues used by the native controls in assigning gender to those lexical items. However, results from the lexical items that end in [-a] and combined with the masculine gender do not support the heritage speakers' sensitivity. Their results indicate relatively high rates of accepting the items ending in [a] as masculine (M = 0.64; SD = 0.13) for HS1, (M = 0.46; SD = 0.39) for HS2. The relatively high standard deviation compared to the mean indicates a considerable variability in the participants' responses within the HS2 group.

With regard to the lexical items that did not end in [-a], the control group showed high rates of acceptance when the items were combined with the masculine determiner (M = 0.83; SD = 0.09), and strongly rejected them when they were presented with the feminine determiner (M = 0.17; SD = 0.11). In addition, both groups of heritage speakers seemed to follow the same tendency towards accepting phrases of loanwords not ending in [-a] and combined with the masculine determiner (M = 0.88; SD = 0.16) for HS1, (M = 0.94; SD = 0.06) for HS2. Although to a lesser degree, both heritage groups tended to accept the items with no [-a] ending as feminine (M = 0.56; SD = 0.18) for HS1, (M = 0.40; SD = 0.18) for HS2. It has to be noted that data from one participant was removed and considered an outlier as the participant accepted everything as 'sounds good'. We could not use the expressions "grammatical" vs. "ungrammatical" as there is no reference upon which we can make such a judgment. As such, the analysis of the results mainly compares the performances of the three groups.

## 5.3. Results of the Gender Assignment Task

One participant from the control group did not complete the Gender Assignment Task; as such, data from the control group represent seven individuals instead of eight. The total counts and percentages by word ending and per group are calculated and summarized in Table 5. As Table 5 shows, the monolingually raised control speakers had a clear rule for assigning gender to borrowings ending in [-a] as 91% of the responses to this category were assigned the feminine gender, and 80% of the words that did not end in [-a] were assigned the masculine gender. The HS2's results were comparably similar to that of their results in the Elicited Production Task as they assigned the feminine gender to 84% of the lexical borrowings that ended in [-a]. Results from HS1, however, strongly suggest the speakers' sensitivity to the loanwords' endings. That is, unlike their performance in the Elicited Production Task, when asked to consciously assign gender to loanwords, HS1 participants relatively based their decisions on word endings, and in that way resembling their control and HS2 counterparts. HS1's responses to the loanwords that had the [-a] ending were 73% feminine and only 27% masculine.

Table 5: Counts and percentages of responses to the Gender Assignment Task by word ending per group[6] N (%)

|  | With [-a] ending | | | No [-a] ending | | |
|---|---|---|---|---|---|---|
|  | Masculine | Feminine | Total | Masculine | Feminine | Total |
| HS1 (N=7) | 15 (27) | 40 (73) | 55 (100) | 158 (84) | 30 (16) | 188 (100) |
| HS2 (N=8) | 10 (16) | 54 (84) | 64 (100) | 155 (72) | 60 (28) | 215 (100) |
| Controls (N=7) | 5 (9) | 51 (91) | 56 (100) | 152 (80) | 37 (20) | 189 (100) |

## 5.4. Results of the Translation Task

The purpose of this task was to collect data about the participants' dialectal variation with regard to the use of loanwords. Each Arabic masculine word was assigned 1, and each Arabic feminine word assigned 2. Responses were calculated and a summary of the total counts and percentages of translations with their gender is shown in Table 6. As to the preceding task, the number of controls who participated in this task was seven, not eight. The majority of the translations provided by the native controls were feminine at 61%, with 39% masculine. Results from the HS2 group are in line with the control group as 68% of the translations by the HS2 group were feminine and 32% were masculine.

Table 6: Counts and percentages of translations by gender per group N (%)

|  | Masculine | Feminine | Total |
|---|---|---|---|
| HS1 (N=7) | 25 (56) | 20 (44) | 45 (100) |
| HS2 (N=8) | 25 (32) | 53 (68) | 78 (100) |
| Control (N=8) | 33 (39) | 52 (61) | 85 (100) |

The HS1 responses, however, present a different trend as 56% are masculine and 44% are feminine. The total number of translations provided by each group seems to offer a glimpse into the participants' vocabulary. This is because the loanwords used in this study are, or should arguably be, familiar to Arabic speakers across most dialects. Caution must be taken in drawing such a conclusion since the number of individuals in each group can affect the total number of responses. Although it was not investigated thoroughly, the data obtained from the translation

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[6] Data from one loanword jacket was incomplete during collection, thus it was eliminated. There were three participants who responded "both genders" or "no gender" to three different loanwords. Such responses were counted as 0.

task suggest that "semantic analogy" (Corbett, 1991, p.75) is not a key factor in gender assignment to loanwords by both groups of heritage speakers as well as the native controls especially in comparison with morphophonological cues.

In summary, results from the Elicited Production Task show that the HS2 group was more sensitive to the loanwords' endings compared to the HS1. In the Grammaticality Judgment Task, HS1's and HS2's performances clearly diverged from the native controls. That is, both HS1 and HS2 had difficulty in making consistent judgments, with data from HS2 being slightly more consistent than data from HS1. When asked to deliberately assign gender to loanwords, however, both groups of heritage speakers were more perceptive of the loanwords' endings, and so resembled the native controls. The slight difference between the performance of the HS2 and the HS1 in the previous tasks holds true for the Gender Assignment Task and the Translation Task. Data from all groups revealed that, in the absence of the [-a] ending, the higher chance is for loanwords to be assigned the masculine gender.

## 6.    Discussion

This study aimed to gain a deeper insight into the assignment of grammatical gender to loanwords by heritage speakers of Arabic. More specifically, the study was designed to address three research questions: "Will heritage speakers differ from the control group in assigning grammatical gender to loanwords that denote objects? What patterns can be detected in the performance of the heritage speakers in assigning gender to loanwords? And, Will heritage speakers be as sensitive to the morphophonological cues in loanwords as native speakers are?" And since grammatical gender appears to be acquired early in life for first language acquirers (Omar, 1973), a positive correlation was predicted between the heritage speakers' age of arrival to Canada and the similarity of their performance to that of the native controls. Our data from the Elicited Production Task support this prediction as the HS2 group was more likely to base gender assignment on the loanwords' endings, just as the native controls did, but unlike the HS1 group. Similar results were obtained from the Grammaticality Judgment Task and the Gender Assignment Task to various degrees. The consistent difference in performance between the three groups can be attributed to the heritage speakers' insufficient exposure to the Arabic language at an early age and massive exposure to a language with very limited notion of grammatical gender, English. These results are inline with previous findings by Albirini et al. (2011) and Albirini et al., (2013), who revealed the vulnerability of grammatical gender in the oral production of Arabic heritage speakers. While Arabic distinguishes two genders, masculine and feminine, and all words, regardless of animacy, are assigned to one or the other, English, on the other hand, lacks this complexity in the expression of grammatical gender. Inanimates are not inherently assigned a gender in English. As such, heritage speakers' predominant exposure to English at an early age is a possible explanation for their consistently divergent performance from that of native controls. Particularly, it could explain why the heritage speakers' group, HS2, who immigrated to Canada after the age of four, performed more similarly to the native controls than the HS1, whose mean age of arrival in Canada was two years and seven months. Based on the age of mastering grammatical gender by Arabic L1 speakers (Omar, 1973), our data tentatively suggest that the divergent performance of the HS2 group on gender assignment is due to attrition, while HS1's performance is maybe affected by incomplete acquisition.

The native controls' results from Elicited Production, Grammaticality Judgment, and the Gender Assignment tasks support previous findings, which suggest that Arabic speakers depend on the (morpho)-phonological endings of the loanwords in assigning them gender (Mustafawi, 2002; Moshref, 2010; AL-Saidat, 2011). However, unlike what was suggested in (Mushref, 2010), we found that in the absence of the morphophonological ending, Arabic native speakers tend to assign the masculine gender to loanwords. This tendency was also observed in the heritage speakers' performance, particularly in the Elicited Production Task and the Gender Assignment Task. It was found in previous research that when a heritage speaker's linguistic

system lacks the gender of a specific noun, he/she is most likely to assign it the masculine gender (Albirini et al., 2013). This interpretation is supported by the hypothesis that regards the masculine gender as the default (Albirini et al., 2013) and unmarked in Arabic.

The third research question originated in research on the assignment of gender to loanwords by Arabic native speakers. Regardless of the dialect of the Arabic speakers, the same results were obtained by Mustafawi (2002), Moshref (2010), and AL-Saidat (2011), who highlighted the role of word endings in assigning gender to loanwords. The factor of the word endings, (the morphophonological cue), was investigated in our study, and the two groups of heritage speakers responded differently across all tasks. In the Elicited Production Task, and with regard to the loanwords ending in [-a], the HS2 group performed in a somewhat similar pattern compared to the native controls, while the HS1 group was more divergent. This similarity appeared to a lesser degree in the Grammaticality Judgment Task, where the performance of both groups was inconsistent compared to the native controls. Nonetheless, when deliberately asked to assign gender to loanwords, HS1 participants were more accurate in abiding by the morphophonological rule. That is, they paid more attention to and made use of the word endings while assigning gender to loanwords, much like their native and HS2 counterparts, with relatively marginal differences among the three groups.

In addition to age of arrival's effect (discussed earlier), the performance of the heritage speakers' groups can be attributed to the type of task conducted. That is, heritage speakers' performance was enhanced by the explicit instructions in the Gender Assignment Task where they were given the chance to process the given loanwords and consciously make their decision of which gender they would assign to each word. Conversely, in the Elicited Production Task, speakers are unaware of the actual purpose of the task. Additionally, in the Grammaticality Judgment Task, speakers were urged to provide their first intuition upon listening to each phrase, leaving them no opportunity to reflect upon their judgments. Another possible reason is the fact that the lexical borrowings that were used in the Gender Assignment Task appeared at least once in the two previous tasks, which could be considered a sort of training, providing the speakers with the chance to process the words before they encountered them again in the Gender Assignment Task. Switching the order of the tasks for half of the groups was not an option due to the deliberate nature of the Gender Assignment task, which would have revealed the purpose of the study.

## 6.1   Limitations

Although our results indicate few generalizable patterns supported by previous research, this study could benefit from a number of amendments. Our study could benefit from a larger and more unified sample, as for instance, heritage speakers with one level of proficiency, either beginners or intermediate. That is, it would be helpful to run a proficiency test and compare the results to the data on gender assignment. Furthermore, students are exposed to French in public schools in Canada, and English in many public schools in Arabic speaking countries. Some students even enrol in international schools or French immersion programs. We believe that it will be effective to consider a number of factors such as instruction language at school, language spoken at home with parents and siblings (origins of dialects), and age of onset of bilingualism. This study was also limited in terms of information about frequency of loanwords, as data on World Loanwords Database (WOLD) lack the information about loanwords borrowed into Arabic.

## 7.   Conclusion

This study investigated heritage speakers' knowledge of grammatical gender through gender assignment to loanwords. Both groups of heritage speakers diverged from the control group on

all tasks, yet at different levels. Our results showed a strong tendency towards assigning the masculine gender to loanwords across all groups, particularly in the absence of the morphophonological cues. The study also showed that heritage speakers were more sensitive to the morphoponological cues in a metalinguistic task, the deliberate gender assignment task, than in the other tasks. Finally, it would be interesting to investigate, in future research, gender assignment to loanwords by heritage speakers in a quasi experiment to detect possible language change.

**Notes**

1. Loanwords and lexical borrowings are used interchangeably.
2. Native speakers and monolingually raised are used interchangeably to refer to the control group in this study.
3. Feminine markers are represented in Arabic calligraphy in four ways (Alshamsan, 1997; Ryding, 2005), but phonetically they are commonly represented as [a] at the end of a feminine noun; this is because it is difficult to perceive the glottal stop as in (d) below.

    a. ta:ʔ marbutˤa [a(t)] as in جنة dʒanna 'garden'
    b. ʔalif mamduda [a] as in عصا ʕasˤa 'stick'
    c. ʔalif maqˤsˤu:ra [a] as in حمى ħumma 'fever'
    d. ʔalif mamduda followed by a hamzah [aʔ] as in صحراء sˤaħaraʔ 'desert'

4. Some references mention three categories for gender in Arabic, where the third includes nouns that can be treated as both feminine and masculine. However, this third category should not be confused with the neutral gender, which does not exist in any of the Semitic languages (Caspari & Wright, 1951, p. 177), (Ryding, 2005, p. 119).
5. The term ungrammatical in this paper is widely used because grammatical gender for objects in Arabic is not a clear-cut argument; although most nouns are commonly assigned to specific gender by Arabic speakers, using the opposite gender with a noun denoting an object is not linguistically incorrect (Ashamsan, 1997).
6. Notations used in the text:

    • DET= determiner
    • ADJ=adjective
    • MAS=masculine
    • FEM=feminine

**References**

AL-Saidat, E. (2011). English Loanwords in Jordanian Arabic: Gender and Number Assignment. *Language Forum, 37*(1), 59-72. Retrieved from http://www.researchgate.net/publication/237233159_English_Loanwords_in_Jordanian_Arabic_Gender_and_Number_Assignment

Albirini, A. (2013). Toward understanding the variability in the language proficiencies of Arabic heritage speakers. *International Journal of Bilingualism, 18*(6), 730–765

Albirini, A., & Benmamoun, E. (2012). Aspects of second language transfer in the production of Egyptian and Palestinian heritage speakers. *International Journal of Bilingualism*, *18*(3), 244–273

Albirini, A., & Benmamoun, E. (2014). Concatenative and Nonconcatenative Plural Formation in L1, L2, and Heritage Speakers of Arabic. *The Modern Language Journal*, *98*(3), 854- 871.

Albirini, A., Benmamoun, E. & Charkrani, B (2013). Gender and number agreement in the oral production of Arabic Heritage speakers. *Bilingualism: Language and Cognition, 16,* 1- 18.

Albirini, A., Benmamoun, E., & Saadah, E. (2011). Grammatical features of Egyptian and Palestinian Arabic heritage speakers' oral production. *Studies in Second Language Acquisition, 33,* 273–303.

Aldajan, D. (2014). *Arabic nominal agreement with broken plural nouns: Evidence from heritage speakers.* Unpublished manuscript, Department of French Studies, Western University, Ontario, Canada.

Anderson, R. 1999. Noun phrase gender agreement in language attrition. Preliminary results. *Bilingual Research Journal 23*, 318–337.

Anderson, R. 2001. Lexical morphology and verb use in child first language loss. A preliminary case study investigation. *International Journal of Bilingualism 5*, 377–401.

Ashamsan, I. 1997. *Lessons in morphology*. Vol. 2. Alriyadh: Arrushd. (In Arabic)

Benmamoun, E., Albirini, A., Montrul, S. A., & Saadah, E. (2014). Arabic plurals and root and pattern morphology in Palestinian and Egyptian heritage speakers. *Linguistic Approaches to Bilingualism*, *4*(1), 89-123.

Benmamoun, E., Montrul, S., & Polinsky, M. (2013). Defining an "ideal" heritage speaker: Theoretical and methodological challenges. *Theoretical Linguistics*, *39*(3-4), 259-294.

Berman, R. A. (1981). Regularity vs. anomaly: The acquisition of Hebrew inflectional morphology. *Journal of Child Language*, *8*(2), 265-282.

Caspari, C. P., & Wright, W. L. (1951). *A Grammar of the Arabic language: Translated from the German of Caspari and edited with numerous additions and corrections* (3rd ed.). (W. R. Smith, & M. De Goeje, Eds.) London: Cambridge University Press.

Corbett, G. G. (1991). *Gender*. Cambridge, UK: Cambridge University Press.

Cowell, M. W. (1964). *A reference grammar of Syrian Arabic: based on the dialect of Damascus*. Washington, D.C: Georgetown University Press.

Crystal, D. (2003). *A Dictionary of linguistics and phonetics* (5th ed., p. 56). Malden, MA: Blackwell Publishing.

Dewaele, J. M., & Véronique, D. (2001) Gender assignment and gender agreement in advanced French interlanguage: a cross-sectional study. *Bilingualism: Language and Cognition,* 4 (3) pp. 275-297.

Greenberg, J. H. (1966). *Language universals: With special reference to feature hierarchies*. The Hague: Mouton.

Haugen, E. (1950). The analysis of linguistic borrowing. *Language*, 26(2), 210-231. Retrieved from http://www.jstor.org/stable/410058?pq- origsite=summon&seq=2#page_scan_tab_contents

Holes, C. (2004). *Modern Arabic: Structures, functions, and varieties*. Washington, D.C: Georgetown University Press.

Ibrahim, M. H. (1973). *Grammatical gender: Its origin and development*. The Hague: Mouton.

Karmiloff-Smith, A. (1978). The interplay between syntax, semantics and phonology in language acquisition processes. In R. N. Campbell & P. T. Smith (Eds.), *Recent advances in the psychology of language* (pp. 1–23). New York, NY: Plenum Press.

Karmiloff-Smith, A. (1979). *A functional approach to child language: A study of determiners and reference*. Cambridge, UK: Cambridge University Press.

Konta, I. (2012). Gender assignment and gender agreement in child Greek L2. *The 10th International Conference of Greek Linguistics*. Retrieved from http://www.icgl.gr/files/English/29.Konta_10ICGL_pp.381-389.pdf

Kupisch, T., Müller, N., & Cantone, K. F. (2002). Gender in monolingual and bilingual first language acquisition: Comparing Italian and French. Lingue e linguaggio, 1(1), 107-150. Retrieved from http://duepublico.uni-duisburg-essen.de/servlets/DozBibEntryServlet?mode=show&id=25331&lang=en

Lukyanchenko, A., & Gor, K. (2011). Perceptual correlates of phonological representations in heritage speakers and L2 learners. In N. Danis, K. Mesh, & H. Sung (Eds.), *Proceedings from the 35th Annual Boston University Conference on Language Development* (pp. 414– 426).

Mills, A. (1986). Theories of opposition and markedness. In *The acquisition of gender: A study of English and German*. Berlin: Springer-Verlag.

Montrul, S. (2002). Incomplete acquisition and attrition of spanish tense/aspect distinctions in adult bilinguals. *Bilingualism: Language and Cognition,* 5(1), 39-68. doi:10.1017/S1366728902000135 Retrieved from http://journals1.scholarsportal.info.proxy1.lib.uwo.ca/details/13667289/v05i0001/39_iaaa ostdiab.xml

Montrul, S., & Potowski, K. (2007). Command of gender agreement in school-age Spanish- English bilingual children. *The International Journal of Bilingualism, 11*(3), 301-328.

Montrul, S., Foote, R., & Perpiñán, S. (2008). Gender agreement in adult second language learners and Spanish heritage speakers: The effects of age and context of acquisition. *Language Learning, 58(3),* 503–553.

Moshref, O. (2010, April 1). Grammatical Gender Assignment of English and French Loan Words in Egyptian Arabic. *Arabic Linguistics Symposium*. Austin, Texas, United States of America. Retrieved from academia.edu: http://www.academia.edu/2015318/Grammatical_gender_assignment_of_English_and_Fr ench_loanwords_in_Egyptian_Arabic

Mustafawi, E. (2002). Loan English-Origin Nouns in Arabic: Codeswithches or Borrowings? *In Proceedings of the Annual Conference of the Canadian Linguistic Association* (pp. 219- 231). Montreal: Canada. Retrieved from http://homes.chass.utoronto.ca/~cla- acl/2002/Mustafawi_2002.pdf

Omar, M. K. (1973). *The acquisition of Egyptian Arabic as a native language*. The Hague: Mouton.

Pérez-Pereira, M. (1991). The acquisition of gender: What Spanish children tell us. *Journal of Child Language*, 18, 571-590.

Polinsky, M. (2008). Gender under incomplete acquisition: Heritage speakers' knowledge of noun categorization. *Heritage Language Journal*, *6*(1), 40-71. Retrieved from http://www.international.ucla.edu/media/files/M_P_HLJ_6_1.pdf

Polinsky, M. (2011). Reanalysis in adult heritage language. *Studies in Second Language Acquisition*, *33*(02), 305-328. Retrieved from http://journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8271448&fi leId=S027226311000077X

Rothman, J. (2009). Understanding the nature and outcomes of early bilingualism: Romance languages as heritage languages. *International Journal of Bilingualism*, *13*(2), 155-163.

Ryding, K. C. (2005). *A reference grammar of modern Standard Arabic*. Cambridge, UK: Cambridge University Press.

Schmid, M. (2011). *Language attrition*. Cambridge, UK: Cambridge University Press.

Versteegh, C. H. M., & Eid, M. (2006). Turkish Loanwords. *Encyclopedia of Arabic language and linguistics*. Vol. 1, (p. 591). Boston; Leiden: Brill.