Gender Differences in Verbal Fluency and Language Dominance by Arab Students

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Abstract

This study falls within Multi-lingual Processing area. The aim of this study is to investigate the language dominance and gender differences in verbal fluency by Arab students in a foreign country. The impact of duration residence's years and the differences in the phonological and semantic fluency by gender in English as a foreign language, Standard Arabic and Arabic dialect among Arab students at Pannonia University in Hungary are examined. Ten Arab students were involved in this study (five males and five females) between the ages of 25-35 years old. The task in this study contained two main categories to measure the phonological and semantic fluency. The participants were asked to write as many words as they could that started with letter (S) in one minute in the phonological category. While in the semantic category, they were required to write as many jobs as they could in English, Standard Arabic and Arabic dialect. This study concludes that the phonological fluency in English and Arabic dialect is higher than in Standard Arabic. However, the semantic fluency in Standard Arabic and Arabic dialect is higher than English because vocabulary in both categories are almost the same. It is also found that female participants are more fluent in the phonological and semantic categories. Nevertheless, there are no real differences in processing the phonological and semantic tasks according to gender among educated Arab students residing in a foreign country.

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Introduction

Verbal fluency (VF) tests are mostly used in neuropsychological assessment research and clinical practice. These tests are also used to investigate cognitive functions, language use and language dominance (Luk & Bialystok, 2010; Schmid & Keijzer, 2009). Shao et al. (2014) define verbal fluency task as a test that normally consists of two categories to test verbal functioning, such as semantic fluency and phonological fluency that is usually named as letter fluency.

Demographic characteristics of the participants can play a role in the semantic and phonological fluency. For example, Age, level of education and gender are thought to be influential and can affect fluency. Nevertheless, these variables especially gender have inconsistent results. The impact of gender on verbal fluency has been a debatable issue. Many studies in the field of VF reported contradicting results about this variable. For instance, Kurth et al. (2017) study reported results about the gray matter in female brains in Bormann area 44 and 45, and it asserted the superiority of females in verbal fluency and verbal memory tasks. However, Berminger, and fuller (1992) research manifested the males' superiority in the oral verbal fluency tests. Other studies that investigated age, gender and education reported other inconsistent results. For example, Van Hooren et al. (2007) conducted a study to determine the effect of age, education and sex on cognitive speed, verbal memory, executive functioning and verbal fluency on group of 578 participants aged 64-81. The data analysis showed that gender has been noticed to affect verbal memory.

Women were found to perform better on the verbal memory tests. However, Tombaugh et al. (1999) study that collected normative data of phonemic verbal fluency (FAS) and categorical verbal fluency found that gender accounted for less than 1% of variance for FAS and animal naming. Mathuranath et al. (2003) also conducted a study to examine the impact of age, education and gender on VF in cognitively unimpaired Malayalam older learners. The study concluded that level of education significantly influence letter fluency. However, age and level of education were found to affect the semantic fluency. Nevertheless, gender impact had no effect on sematic and phonological fluency. Another study which was conducted by Brucki et al. (2004) analyzed the influence of education, gender and age on verbal fluency. They examined 257 healthy participants with a mean age of 49.42 years and having a mean educational level of 5.58 years. The gender variable was not found significant in the various tasks. However, age seemed to influence the number of category changes. On the other hand, educational level had a statistically significant effect on all measures, except for clustering.

In addition to investigating the gender impact on VF, the present study aims to investigate the language dominance among these Arab students according to the duration of their residence in Hungary. Dominance is defined as the asymmetries of using one language over the other in terms of skills and production. Abundant body of research has been conducted to examine language attrition and language dominance in bilingual immigrants (Schmid & Keijzer, 2009). The aim of this study is to investigate the language dominance and gender differences in verbal fluency by Arab students in a foreign country. This study is intended to investigate the following questions: What is the difference in processing the phonological

and semantic verbal fluency among English as a foreign language, standard Arabic and Arabic dialect? Is there a difference in processing the phonological and semantic verbal fluency tasks according to the participants' gender?

Literature Review

What is the difference between a language and a dialect?

Regional dialects, from the linguistic point of view, are just as rich and complex as standard languages, although in some cases, they have similar vocabularies, grammars, and sounds. Speaking in different dialects unquestionably is experienced by Arab speakers as they have Standard (dialect) Arabic and different regional Arabic dialects. They may unconsciously have the ability to shift sociolinguistic styles in different contexts. These styles range along a continuum between different dialects, usually standard and vernacular varieties. The extreme ends of the style-switching continuum are often assumed to be 'bidialectalism' (Hazen, 2001).

Mitterhofer (2013, p. 8 cited Lewis 2009) define dialect as follows: "[e]very language is characterized by variation within the speech community that uses it. Those varieties, in turn, are more or less divergent from one another. These divergent varieties are often referred to as dialects. They may be distinct enough to be considered separate languages or sufficiently similar to be considered merely characteristic of a particular geographic region or social grouping within the speech community. Often speakers may be very aware of dialect variation and be able to label a particular dialect with a name."

According to Crystal (1997 cited in Solano, 2006), a dialect can be defined as a variety of a language that is distinguished from other varieties of the same language by its pronunciation, grammar, vocabulary, discourse conventions, and other linguistic features. In addition, Farr & Ball (1999, p. 206) confirm that dialects are rule-governed systems, with systematic deviations from other dialects of the same language. Dialects are seen: "as complex and as regularly patterned as other varieties of English, which are considered more standard". Thus, although the term dialect is frequently used to refer to the language used by people from a particular geographic or social group or to mean a substandard variety of a language, in fact everyone speaks dialects (Preston, 1993 as cited in Solano, 2006). Mitterhofer (2013, p. 6) differentiates between a dialect and standard language as follows:

> Dialect and language differ by their different domains of use. Dialects are used more among family and friends, in local settings and work places and they are usually spoken, not written. The standard language is used in public and official domains, e.g. in education, administration, literature, science, etc. Yet, this is not always the case, as speakers of the speech variety which has become the standard language will use the standard language also in the domains of family and local settings. At the same time dialects sometimes are used also in more formal and official settings.

Standard Arabic and Arabic dialects

Standard Arabic or the language of the Holy Quran is the official language in the Arab world. The standard version of Arabic is widely use in written literature, official media and the medium of education (Cotterell & Callison, 2014). On the other hand, dialects of Arabic are considered spoken languages that descended from standard Arabic. Dialects may differ through the ordering or addition of rules. Sometimes these dialects are so different and varied to the extent that some speakers cannot understand others from other regions. This linguistic phenomenon is known as diglossia, in which the standard language varies extremely from the spoken dialect. The Arabic dialects differ for historical reasons and have been individually influenced by the pre-Arabization language spoken by the population, as is the case with Aramaic in the Levant, as well as the European languages from the time of colonization. Such distinctions are important as North African dialects are unique in the quantity of French loanwords, whereas Iraqi Arabic has been historically more influenced by Turkish. Shaalan and Ziedan (2007) study found on five main characteristics that differentiate standard Arabic from Egyptian.

1. Distortion of verbs (e.g. حاآتب من سأآتب ـ ضَرَبْتِيه من ضَرَبْتِّه ـ بليته من بللته ـ ـ ماتأعد من) أما تقعد

2. Distortion of nouns. (e.g. الخِير من الخَي ـ ده مﮬﮬﮬﮬ ـ جَمهﮬﮬﮬن ﮬﮬر ـ ذاﮬﮬﮬخائف من خايف ور ـ من). (جُمهور ـ مين من مَنْ ـ فين من أين)

3. Distortion of Pronouns and letters meanings. (e.g. احنا من نحن ـ عصايتي من عصاي) هوَّ من هُوَ ـ

4. Distortion of the structure of the word form (e.g. تلات شهور من ـ اتاوب من تثاءب) ثلاثة شهور

5. Replace the characters and movements. (e.g. سقب من ثقب ـ توم من ثوم ـ تِعبان من ثعبان ـ) (شبط من شبث "أي تعلق

Bilingualism impact on verbal fluency

Studies in the field Bilingualism have detected positive impacts on verbal fluency. For example a longitudinal study was conducted to examine the impact the effect of bilingualism on memory call, verbal and categorical fluency by Ljungberg et al. (2013) and it showed that bilingual participants outperformed monolinguals in memory recall and letter fluency. However, there was no correlation between bilingualism and categorical fluency. Another research conducted by Luo and Bialystok (2010) investigated verbal fluency in monolinguals and bilinguals. The data analysis revealed that high-vocabulary bilinguals performed better in the letter fluency task.

Bilingualism has not been always seen beneficial when it comes to verbal fluency. Gollan et al. study (2002) showed that monolinguals" superiority in verbal fluency tasks. Bilinguals participants scored lower than monolinguals in all verbal fluency tasks, which suggests that language switching can cause slowing in the verbal process.

Methodology

Sample of the research

The sample contained 10 Arab students (five males and five females) dwelling in Vezsprem/ Hungary, aged of 25 to 35. Eight participants were MA students, while two of them were PhD candidates at Pannonia University in Hungary who come from different region in Arab. The writers and all the participants are colleagues at the same faculty university; therefore they got their access to them. In their countries, each of them speaks two different dialects namely standard Arabic and their regional Arabic dialect.

Instrument

This study employs quantitative methods in order to answer the research questions. The research instrument used was two kinds of fluency tests; phonological and semantic fluency tests. The task contained two main categories to measure the phonological and semantic fluency in English as a foreign language, standard Arabic and Arabic dialect.

The phonological fluency, the participants were asked to write as many words as they can that start with letter (S) in the phonological category, since the letter (s) has almost the same frequency both in English and Arabic (English: 6.3%, Arabic: 6.01%). The instructions were in Arabic. When the participant provided words with the same root (e.g. variations of gender, number) that belong to the same word, just the first answer was credited. In addition, when the participant named numbers, the first answer was only credited. However, if the participant named the same word more than once with different meaning, the answer was accepted. Regional and slang words in the dialect Arabic were also accepted if the participants were able to explain their meaning.

The semantic fluency, the subjects in the semantic task were required to write as many jobs as they can in English, Standard Arabic and Arabic dialect within one minute. The instructions were also in Arabic. Regional designations of jobs were accepted in dialect Arabic. Any repetition of the same job (including jobs' variations according to number or gender) was not credited.

Data collection procedure and analysis

To collect data, students were sent an electronic quiz via email and they were asked to fill a quiz that contained three main sections in English, standard Arabic and Arabic dialect. The first part of the quiz contained two demo sections (phonological and semantic). The first section asked the participants to name as many words as they can that start with the (A) letter. However, in the semantic section, the subjects were asked to name as many animals as they can in one minute. When the minute passes, the participants move directly to next category. The quantitative data from the quiz was analyzed by using SPSS program to extract the mean and standard deviation through descriptive and inferential statistics. The findings were presented in tables and illustrated in bar charts.

Findings

This study is intended to find the difference in participants' phonological and semantic fluency when producing words in a given time and to discover whether their gender can have an impact on verbal fluency tasks. From the tests performance and SPSS data analysis, the results can be shown as presented in following tables:

Table 1. *Means, standard deviations, and correlations (phonological category)*

Variable	N	M	SD	1	2	3
Eng (s)	10	9.50	2.63	--	.54	.73*
StanArab (s)	10	7.50	3.86	.540	--	.84**
DiaArab (s)	10	9.30	2.94	.737*	.84**	--

Figure 1. *Sum of word that starts in(S) in English, standard Arabic and Arabic dialect*
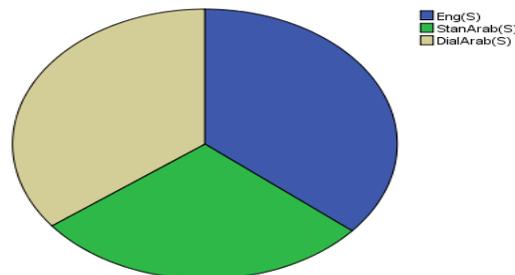

Table and figure (1) show that the phonological fluency in English (M=9.50, SD=2.63) and Arabic dialect (M=9.30, SD=2.94) are higher than that in Standard Arabic (M=7.50, SD=3.86). The average of words that start in (S) which the participants wrote in one minute in English and Arabic dialect are almost the same. While, the number of words that start in (S) in standard Arabic are less than that in English and Arabic dialect which can be attributed to the fact that these participants are in Hungary and they use these two languages more frequently than standard Arabic. It can also be noticed from the above table that the data set is normally distributed because the SD is > 0.05. It reveals a significant correlation between English and Dialect Arabic at the 0.05 level and a strong correlation between standard Arabic and dialect Arabic at the 0.01 level in the phonological category.

Table 2. *Means, standard deviations, and correlations (semantic category)*

Variable	N	M	SD	1	2	3
Eng (job)	10	7.90	3.44	--	-.40	-.28
StanArab (job)	10	12.80	355	-.40	--	.78**
DiaArab (job)	10	12.20	23.79	-.28	.78**	--

Figure 2. *Sum of jobs in English, standard Arabic and Arabic dialect*
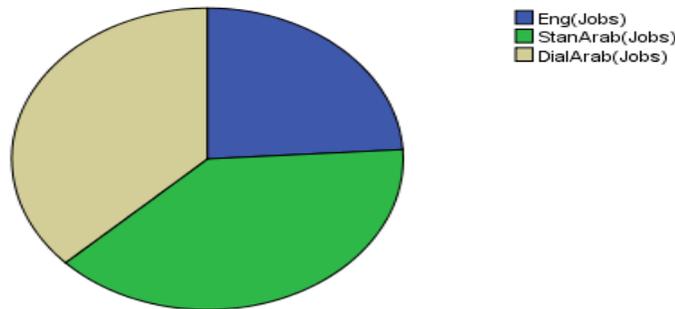
It can be noticed from table and figure (2) that the semantic fluency in Standard Arabic and Arabic dialect is higher than English. The average of words in (jobs category) which the participants wrote in one minute in Standard Arabic (M=12.80, SD=3.55) and Arabic dialect (M=12.20, SD=3.79) is almost the same. While, the mean of words in (jobs category) is less in English (M=7.90, SD=3.44) which can be attributed to the fact that both jobs in Standard Arabic and Arabic dialect are almost the same. The previous table shows that the data set is normally distributed because the SD is > 0.05. There is also strong correlation between standard Arabic and Dialect Arabic at the 0.01 level. The second task was given in order to find whether there are any phonological fluency differences between male and female participants.

Table 3. *Gender difference in the phonological fluency*

Gender		Eng(S)	StanArab(S)	DialArab(S)
Female	Mean	10.6	9.6	10.8
	N	5	5	5
	SD	1.5	3.6	2.2
Male	Mean	8.4	5.4	7.8
…………..	N	5	5	5
	SD	3.2	3.0	2.9

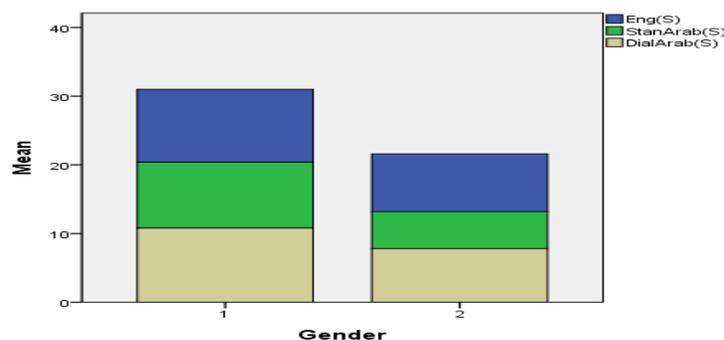**Figure 3**. *Gender difference in the phonological category*

Table and figure (3) show that females (1) superiority in performance in the phonological fluency task in English, standard Arabic and Arabic dialect over the males (2). In all categories of tasks, female mean scores are higher around two points than male: 10.6 for English, 9.6 for standard Arabic and 10.8 for Arabic dialect.

Table 4. *Gender differences in the sematic the fluency task*

Gender		Eng (Jobs)	StanArab (Jobs)	DialArab (Jobs)
Female	Mean	8.2	14.2	13.4
	N	5	5	5
	Std. Deviation	4.02492	4.26615	4.77493
Male	Mean	7.6	11.4	11.0
	N	5	5	5
	Std. Deviation	3.2	2.3	2.4

Figure 4. *Gender difference in the phonological category*
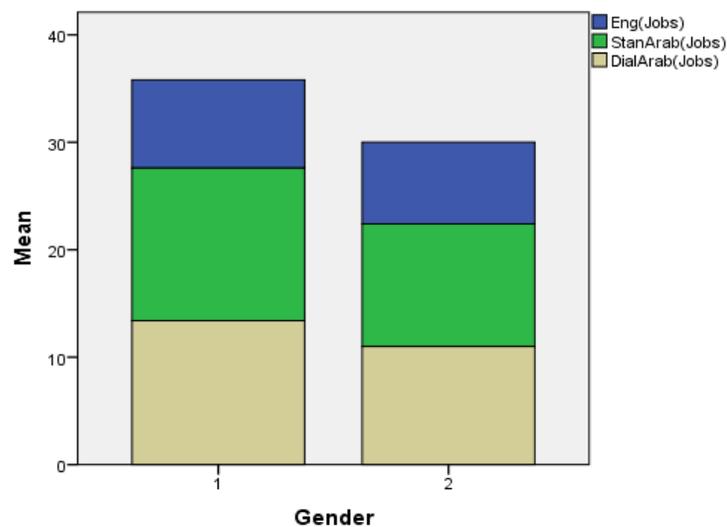
As can be noted from table and figure (4), female participants show that they are more fluent in the semantic fluency task than male participants (2). Yet, the last task display dissimilar results as the difference among participants are insignificant.

Years of residence on verbal fluency/the phonological fluency

A correlation test was conducted to answer question two related to gender differences of participants. The result is revealed as follows:

Table 5. *Language dominance in the phonological fluency tasks*

Years of residence	N	Eng(S)		StandArab(S)		DiaArab(S)	
		M	SD	M	SD	M	SD
0	1	9.00	.	12.00	.	12.00	1
1	4	9.25	3.59	8.50	4.65	10	3.46
2	4	10.5	2.08	6.50	2.64	8.74	2.63
3	1	9.50	3.86	7.50	3.86	9.30	2.94

It can be noticed from table (5) that the phonological fluency according to the years of residence is the following: the participant who just arrived is more fluent in standard Arabic (M=12, SD=.) and Arabic dialect (M=12, SD=1) than English (M=9, SD=.). Four of the participants have resided in Hungary for one year and they were more fluent in English (M=9.25, SD=3.59) and Arabic dialect (M=10, SD=2.08) than standard Arabic (M=8.50, SD=4.65). While the four participants who spent two years were more fluent in English (M=10.5, SD=2.08) than standard Arabic (M=6.50, SD=2.64) and Dialect Arabic (M=8.74, SD= 2.63). However, the participant who spent three years in Hungary were also more fluent in English (M=9.50, SD=3.86) and Arabic dialect (M=9.30, SD=2.94) than standard Arabic (M=7.50, SD 3.86).

Table 6. *Language dominance in the semantic fluency tasks*

Years of residence	N	Eng(job)		StandArab(job)		DiaArab(job)	
		M	SD	M	SD	M	SD
0	1	4.00	.	16.00	.	13.00	.
1	4	6.00	3.16	13.75	4.11	13.75	4.85
2	4	10.50	2.51	12.00	3.26	10.75	3.59
3	1	9.00	.	9.00	.	11.00	.

It can be noticed from table (6) that the semantic fluency according to the years of residence is the following: the participant who just arrived is more fluent in standard Arabic (M=16, SD=.) and Arabic dialect (M=13, SD=1) than English (M=4, SD=.). Four of the participants have resided in Hungary for one year and they were least fluent in English (M=6, SD=3.16), while they were equally fluent in Arabic dialect (M=13.75, SD=4.11) and standard Arabic (M=13.75, SD=4.85). While the four participants who spent two years were almost equally fluent in English (M=10.5, SD=2.08) and dialect Arabic (M=10.75, SD=3.59)

more than in Dialect Arabic (M=12, SD=3.26). However, the participant who spent three years in Hungary was also more fluent in dialect Arabic (M=11, SD=.) Than standard Arabic and (M=9.00, SD=.) and English (M=9.00, SD=.).

Discussion

In sociolinguistics, dialects refer to varieties of a language which differ in vocabulary, pronunciation, and grammar and which are associated with particular geographic regions or social groups. In a context of bi- or multilingual, 'second dialect acquisition' (SDA) most often refers to acquisition of the standard dialect; there are also instances when a non-standardized regional or social dialect is the target (Siegel, 2010). Weener (in Hazen, 2001) points out that "in general, when the speaker of one dialect must process a verbal message from another dialect, the redundancy in that message is less for him than for a speaker of the dialect in which the communication was presented." It also proves that acquiring different dialects lead to dialect attrition in certain varieties. From her study, Poplack (in Hazen, 2001) concludes that it is undeniable that multilingual children possess elements of two or more linguistic systems, and have structured this input in a socially significant way. Multilingualism unquestionably experiences by mostly people around the world including Arabic countries and they may unconsciously have the ability to shift sociolinguistic styles in different contexts. These styles range along a continuum between different dialects, usually standard and vernacular varieties.

The result of this verbal fluency study demonstrates that there are significant differences between two categories of tasks (i. e., Phonology and Semantic) in English, standard Arabic and Arabic dialect. Even so, there are only few of them that indicate significance differences within tasks (within different categories and language). All the languages score are varied and dynamic. Verbal fluency tasks are frequently used in neuropsychological assessment, in clinical practice, and in research. However, verbal fluency tasks have also been used in research on non-clinical groups to measure verbal ability including lexical knowledge and lexical retrieval ability and as a test of executive control ability (Shao et al., 2014).

The reason can be attributed to the fact that the tasks have compelling face validity which executive control abilities or both of a person with a serious deficit in lexical access will perform poorly in the tasks. Fluency scores are useful indicators of general verbal functioning and as essential evidence in knowing how strongly performance in the tasks is affected by each of the abilities involved. The use of the verbal fluency tasks may attain from their face validity as tests of both verbal ability and executive control that participants need to retrieve words of their language. It requires them to access their mental lexicon and they need to focus on the task, select words meeting certain constraints and avoid repetition. Therefore they involve their executive control processes (Fisk & Sharp, 2004).

In this study most participants' answers in the phonological categories are nouns whether they are in English, Standard Arabic or Arabic dialect. This is in line with Clark et al. study in 2014 in which they confirm that participants tend to generate similar items in a close succession during a fluency task. This phenomenon is considered to be due largely to

unconscious processes, such as spreading activation in a network, and is considered to be relatively "automatic."

Moreover, participants generated more words in the semantic fluency task than in the phonemic fluency task which contradicts Grogan et al. study in 2009 in which the participants were more fluent in the phonemic task. However, this result is in line with Cerhan et al. (2002) study which confirms that healthy individuals usually tend to generated more words by the semantic fluency category than by phonological one. Languages that are used often and have therefore a high default level of activation are difficult to suppress or inhibit, but once deactivated are also more difficult to activate.

As all participants in the study live in Hungary as international students, they mostly use English with friends and teachers and use Arabic dialect among Arabic students. Standard Arabic seems to be rarely used by them. When participants were asked to write any word begin with S sound, they perform better in English and Arabic dialect. Accordingly, languages differ in level of activation, and this level of activation will depend on amount of contact and use, level of proficiency reached, maybe method of instruction, age of acquisition and many more variables (de Bot, 2004). It is assumed that at a given moment in time, each language has its default level of activation. First language (L1) which is used more frequent will have a high level of activation, whereas a language learned in the past for a few weeks will have a very low level. De Bot explained that activating a language means increasing its level of activation and it could also mean lowering the level of activation of other languages at the same time. The fact that languages differ with respect to their default level of activation means that we need some system to make it possible to speak a language with a lower level of activation to start with. Without such a system, the stronger language always wins (de Bot, 2008).

Thus, it can be assumed that the deficits in either verbal ability or executive control should manifest themselves in poor performance in the fluency tasks. Therefore, the fluency task is used as an efficient screening instrument of general verbal functioning. Based on some other study evidences, multilingual students in this study had more cognitive flexibility; they might switch not just between languages but one task and the next. Erard (2012) argues that speakers of those two varieties also do a lot of switching back and forth. Moreover, changes of quality between second and third language learning might be based on the differences in norms that the language learners relate to a bilingual norm in third language learning as opposed to a monolingual norm in second language learning (Jessner, 2008).

Most researches on multilingual processing prove that many variables have been shown to play a role in language development. One of them is gender. The result of this study reveals that female participants more fluent than male. This is in line with the study of Maccoby (1966, p. 26) which states that:

> Through the preschool years and in the early school years, girls exceed boys in most aspects of verbal performance. They say their first word sooner, articulate more clearly and at an earlier age, use longer sentences, and are more fluent. By the beginning of school, however, there are no longer any consistent differences in vocabulary. Girls learn to read sooner, and there are more boys than girls who

require special training in remedial reading programs; but by approximately the age of ten.

However, statistically, this superiority in performance is not significant. This result is in line with Hyde et al. (1988) study which confirms that there is no substantial strong evidence of gender difference in the verbal ability tests. This result contradicts Denn's result (as cited in Hyde et al., 1988) that concluded the superiority of females in verbal fluency tests and that they have better verbal abilities than males. Maccoby and Jacklin (1974) report about 85 studies reveals that "Girls' verbal abilities mature somewhat more rapidly in early life, although there are a number of recent studies in which no sec difference has been found. During the period from preschool to early adolescence, the sexes are very similar in their verbal abilities." They assume that at about age 11, the sexes begin to diverge, with female superiority grow through high school and possibly beyond. Girls could perform better and get score higher on tasks involving both receptive and productive language, and on "high-level" verbal tasks (analogies, comprehension of difficult written material, creative writing) as well as upon the "lower-level" measures (fluency).

Conclusion

This study was conducted at Pannonia University in Hungary. It investigated the phonological and semantic fluency of ten Arab students. It concluded that the phonological fluency in English and Arabic dialect is higher than in Standard Arabic. However, the semantic fluency in Standard Arabic and Arabic dialect is higher than English. It was also found that female-participants were more fluent in the phonological and semantic categories. Nevertheless, there are insignificant differences in processing the phonological and semantic tasks according to the gender.

The small sample size in this study means that it could not be generalized. Future larger study should be conducted so it could represent the population of Arab speakers at the same setting of study. Moreover, more detailed information that might affect and influence the speakers' fluency in bilingual context could also be investigated for more comprehensive findings. Therefore, the result of the study could be contributed as reference to develop understanding in multilingual processing area.

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