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Learning a Second Language for Arabic Speakers: Can Word Pair Directionality Make a Difference?

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Abstract: *Text structure (e.g., left-to-right orientation) can bias later task performance by supporting scanning strategies on related tasks (e.g., scanning left-to-right when learning word pairs). The current study was designed to investigate how the reading habits of native Arabic speakers might affect the acquisition of English vocabulary in word lists. Forty Arabic-speaking ESL students were asked to learn two lists of Arabic-English word pairs. The experimental materials were two lists of low-frequency English words with their Arabic translations. In each of two sessions, 20 pairs of English and Arabic words were presented to the participants. The presentation order and position of the words in the list was counterbalanced across students (e.g., Arabic–English vs. English–Arabic). After attempting to learn from both lists, the participants were asked to complete an English–Arabic directional translation test. The results suggest that learning the word pairs from the Arabic–English list resulted in greater recall of English words.*

Key Words: word list, text structure, Arabic language

Learning second language vocabulary using lists of word pairs (rote repetition) is a common practice. Word list learning typically takes the form of students writing vocabulary lists in two columns, with the second language (L2) words alongside their native language (L1) definitions or translations. Word list learning appears to be a "natural" way of learning vocabulary and is one widely used by learners (Nation, 1994). Using word pairs to learn vocabulary can be considered learning receptively (L2–L1) or productively (L1–L2). Receptive learning of word pairs involves learning the meaning of the L2 vocabulary word and then trying to recall its L1 meaning. Productive learning involves already knowing the L1 vocabulary word and then trying to recall its corresponding L2 meaning (Mondria & Wiersma, 2004). Additionally, Mondria and Wiersma (2004) have defined productive knowledge as the ability to translate a word from the first language (L1) to the second language (L2), while word receptive knowledge is the ability to provide an L1 translation of the second L2 word.

A practical question about word lists is whether it is more efficient for novice second language learners to learn word pairs in first language/second language order (L1–L2) or vice versa. Put differently, would learning word pairs from L1 to L2 result in a greater level of recall of the second language word, or does learning in the opposite direction lead to a greater recall of

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L2 vocabulary words? Is there any significant difference in learning when presenting vocabulary words in one order versus another?

As researchers, we are interested in ascertaining whether the association between two vocabulary words in a pair is bidirectional. Put differently, it may be that learning in one direction does not preclude the performance in the opposite direction. If learning is unidirectional, it would follow that the performance of students who tested in the opposite direction of learning would be significantly lower. If learning is bidirectional, do learners perform better when the test is congruent with the direction of learning, do they perform better when it is incongruent with the direction of learning, or is there any significant difference at all? So, the study aimed to examine how does the direction and placement of English vocabulary words and their corresponding Arabic translations in word pairs affect the number of accurate recalls of the English vocabulary words?

RECEPTIVE VERSUS PRODUCTIVE LEARNING

There are prior studies that have compared the two directions of studying and learning word pairs (Griffin & Harley, 1996; Mondria & Wiersma, 2004; Schneider et al., 2002; Stoddard, 1929; Waring, 1997; Webb 2009). In most of these studies, half of the participants learned the words from first language to second language (L1–L2) order, and the other half learned the words from second language to first language (L2–L1) order. Half of the students in each group were tested receptively and productively. Typically, testing took place immediately after learning, and was often followed by delayed testing. Translation tests, which reflect the learning tasks, were used to measure gains in knowledge. Participants were required to translate words from the L2 to L1 and/or required to translate a word from the L1 to L2. These studies show that receptive knowledge was higher than productive knowledge (being able to translate from L1 to L2). Learning in the L1-L2 order took more time than learning in the L2–L1order (Waring, 1997). Based on a delayed test, Schneider et al. (2002) found that subjects who learned word pairs receptively recalled the translations more successfully over time than subjects who learned the word pairs productively. In all of the previously mentioned studies, the results indicated that learning word pairs in second language to first language (L2–L1) order led to greater recall of the second language vocabulary words. Likewise, learning the word pairs in first language to second language order (L1–L2) led to greater recall of the first language vocabulary words (for a review, see Mondria & Wiersma, 2004).

DIRECTIONALITY OF WORD PAIR ASSOCIATION

Prior studies have been conducted that have investigated whether word pair association is bidirectional (Griffin & Harley, 1996; Stoddard, 1929). In these studies, two groups of participants were compared: one group that was tested in the same direction of learning, and a second group that was tested in the opposite direction of their learning. The results of these studies have shown that the word pair association is bidirectional, which means learning in one direction does not preclude the performance in the other direction; learners performed better when the test was congruent with the direction of learning (tested in the same direction of learning) than when it was incongruent (tested in the reverse direction of learning; Stoddard, 1929; Griffin & Harley, 1996).

Studies conducted so far have investigated the effect of word pair directionality only with participants whose first and second languages derive from the same Indo-European family, such as French learners of English. The use of Arabic learners of English as a second language would provide distinct information because the two languages differ considerably. Arabic writing proceeds in a right-to-left direction. The fact that Arabic speakers have already established reading

habits in one direction (from right to left) might make it challenging for learners to retrain their eyes to pick up and process information from a written representation flowing in the opposite direction, like English (Ismail, 2007).

Text structure (e.g., left-to-right orientation) has been shown to bias later task performance by supporting scanning strategies on related tasks (e.g., scanning left to right when learning word pairs) (Ariel at el., 2011; Chokron & De Agostini, 2000; Spalek & Hammad, 2005). In most of the studies conducted, the influence of reading habits was tested by comparing participants of a language with a left-to-right orientation, like English, to readers of a language with a right-to-left orientation, like Arabic. The findings from these studies indicated that the construction of language biases task performance in a way that is consistent with the scanning direction of the readers' native language. In other words, English participants proceeded more often from left to right, whereas Arabic participants tended to proceed from right to left (for a review, see Ouellet, Santiago, Israeli, & Gabay, 2010).

Therefore, if the direction of reading and writing habits directly influence the focus of study (learning the English word), then Arabic learners would hypothetically focus on learning the word that is positioned on the right side of the word pair because this is where the eye is trained to look. Thus, if the direction of the words in the word pair were in first language/second language order (Arabic–English), then the Arabic learners would recall the English word more accurately than if the direction were the opposite, in second language/first language order (English–Arabic). Conversely, if the direction of reading and writing habits did not influence the study's focus (learning the English word), then the Arabic learner would simply focus on learning the English word, whether it was in the left or right side of the word pair. In this case, the recall of the English words would be equal.

The central goal of the current research was to examine how the reading habits of Arabic learners of English as a second language might affect the acquisition of vocabulary in word lists. More specifically, does the direction and placement of English vocabulary words and their corresponding Arabic translations in word pairs affect the number of accurate recalls of the English vocabulary words?

METHODOLOGY

PARTICIPANTS

Forty native Arabic-speaking students (17 female and 23 male) ranging in age from 18 to 52 years old (M=25.6 years, SD=6.76 years) who studied English as a second language in the ESL Center at a large state university volunteered to participate in the study at different levels varying from level 1-10 of English proficiency. Three participants were excluded from the study due to failure to complete the second session of the study.

MATERIALS

The materials for this study consisted of two lists of 20 low-frequency English words alongside their corresponding Arabic translations (see Appendix A). The English words in the two lists have concurring frequency. That is, each of the English words in the first list appears with the same frequency as the English words in the second list. These low-frequency English words were taken from the Word Frequency List of American English (Davies and Gardner, 2010). These low-frequency English words were validated by professionals at the ESL center at the university to verify that none of these words occur in the course books used in the classes.

PROCEDURE

All native Arabic-speaking students who registered for ESL courses for Spring, Summer, and Fall 2016 semesters were invited to participate in the study by e-mail. Students who agreed to participate were told that the experiment was designed to help language learning practice. The study took place in a classroom at the ESL center after the students finished their daily classes. At the beginning of the experiment, participants were told about the two tasks: they would learn word pairs, and their goal was to learn the English translations. The experimental materials, presented on sheets of paper that contained a word list, were given out at the beginning of each experimental learning session and collected at the end of the experiment. The words were presented in two columns without context: from English to Arabic in the first session, and from Arabic to English in the second session (see Appendix A). Writing was not allowed during the time of learning the word lists to prevent the use of any other strategies aside from memorizing the words.

In the first session, 20 pairs of English–Arabic words were presented to the participants. . The presentation order of English–Arabic words in the lists was counterbalanced across students, with half of the students receiving the English–Arabic list and the other half of the students receiving the Arabic–English list. The participants were randomly assigned to the two groups to learn the word lists. The participants had 15 minutes to study the target words. At the end of the 15 minutes, the paper sheets were taken away, and the students were tested immediately after the session. They had 7 minutes to complete the English–Arabic directional translation test. The participants were asked to write the English translation of the Arabic words. The Arabic words were provided in a prescribed order in list form, and the participants had to write the English translations of the words that they could recall. The direction of the word lists in the tests was from English–Arabic. That is, students were given a blank space to write the English word to the left of its Arabic translation (see Table 1 for Arrangement of groups).

Table 1
Arrangement of groups

	Groups	**Direction of Learning**	**Direction of Test**
Session 1	1	English-Arabic	English-Arabic
	2	Arabic-English	
Session 2	1	English-Arabic	Arabic-English
	2	Arabic-English	

During the second session, the sample and the procedure were identical, with another list of 20 pairs of English–Arabic words presented to participants with the cued recall immediately following the 15-minute learning session. Participants studied their word list in the same direction as in Session 1, but the direction of the word pairs in the test was reversed and presented from Arabic–English. Recall, in the first test, students were given a blank space to write the English word to the left of its Arabic translation. In the second test, students were given the Arabic word first with a blank space to the right in which to write the English word.

CODING

Two independent raters scored the tests to ensure reliability. Slight spelling errors were accepted, as long as there was no obvious confusion with another word. Correct answers were

assigned one point, and incorrect answers were assigned no points[1].

Results

Three participants' data were excluded from the study due to failure to complete the second session of the study. Although level is not a focus of the current research, analyses were first conducted with level as a factor. The main effects of level and all interactions were not significant and therefore are not discussed further.

Next, a 2 (within subjects: session) x 2 (between subjects: group) ANOVA was conducted to evaluate the effect of the direction and placement of English vocabulary words and their corresponding Arabic translations in word pairs on the number of accurate recalls of the English vocabulary words. The dependent variable was the number of accurate recalls of the English vocabulary words. Scores could range from 0 of 20. The within-subject factor was the session, divided into session 1 (English-Arabic test) and session 2 (Arabic-English test), and the between-subject factor was the different groups. Table 2 presents the means and standard deviations of groups in session 1 and session 2. The groups-by-session interaction was tested using tests of within-subjects effects. Participants who studied Arabic to English did better numerically on Test 2 (M = 11.00, SD = 4.59) than the group who studied from English-Arabic (M = 8.85, SD = 5.29) (see Figure 1). The interaction approached significance, $F(1.38) = 3.52$, $p = .068$, $\eta^2 = .085$).

Table 2
Mean and standard deviations of groups in session 1 and 2

Groups		Mean	SD
1	Learning 1	8.85	5.29
	Learning 2	7.900	5.91
2	Learning 1	10.15	5.08
	Learning 2	11.00	4.59

Also, an independent-samples t-test using an alpha level of .05 was conducted to evaluate whether learners performed better when the test was congruent with the direction of learning than when it was incongruent with the direction of learning. The test was not significant, $t(38) = -.792$, $p = .433$, $d = .25$. The 95% confidence interval for the differences in mean ranged from -4.62 to 2.02. An examination of the group means indicate that learners did not perform better when the test was congruent with the direction of learning (M = 8.85, SD = 5.29) than when it was incongruent with the direction of learning (M = 10.15, SD = 5.08).

We also conducted a 2x2 ANOVA to evaluate whether males and females differed significantly on number of accurate recalls of the English vocabulary words. The gender-by-learning session 2 interaction was significant, $F(1,36) = 9.86$, $p = .003$, $\eta^2 = .215$. The result shows that females performed better (M = 12.47, SD = 4.79) than males on both tests (M = 7.22, SD = 4.93; see Figure 2).

[1] Data are available on the Open Science Frame

https://osf.io/jn9qz/?view_only=ac36efab8d0c45b782b40a4097247ca0

Figure 1
Mean Number Correct by Learning Session and Group.

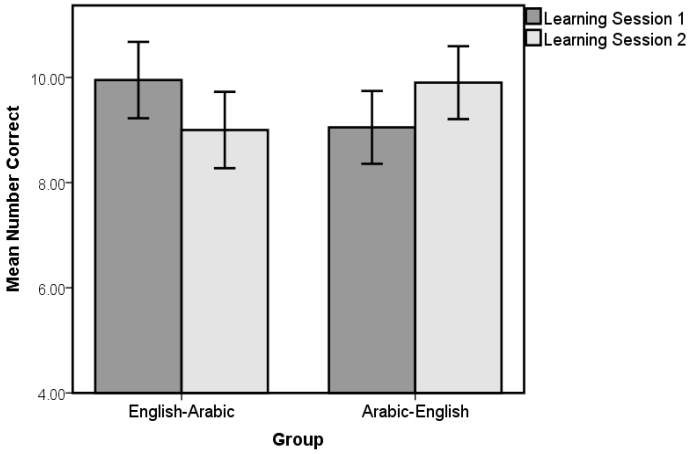
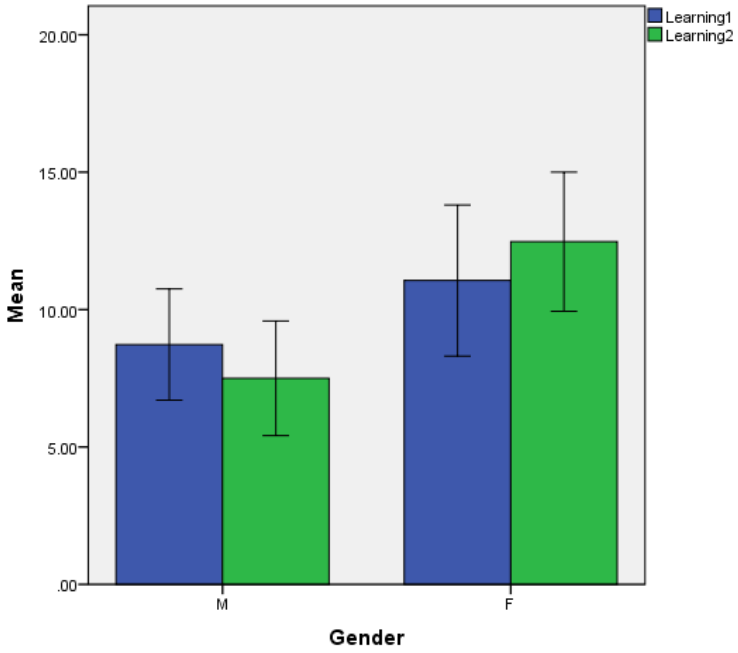


Figure 2
Mean Number Correct by Learning Session and Gender.



DISCUSSION

It is a widespread belief that second language acquisition is influenced by the learners' first language. The first language is a resource of knowledge that learners will use both intentionally and non-intentionally to help them shift the second language data in the input and to perform the best they can in the second language (Ellis, 1986 as cited in Pakzadian, 2012).

Our study aimed to examine how the reading habits of Arabic learners of English as a second language might affect the acquisition of vocabulary in word lists. The results indicate that participants who learned from Arabic to English performed better numerically than participants

who learned in the reverse direction, English to Arabic. Also, the findings reveal that there were no significant differences between the groups' performance whether the tests were congruent or incongruent with the direction of learning. Furthermore, and interestingly, females performed better than males on both tests. So, approaching significant results suggest that learning word lists from first language (Arabic) to second language (English) will result in greater recall of the second language vocabulary words than learning from the opposite direction.

To our knowledge, our study is the first to examine the word lists directionally using two languages that have different direction of reading and writing. Our results were contrary to previous research, which have used two languages derived from the same Indo-European family. Those studies showed that learning word pair from the second language to the first language leads to greater recall of the second language vocabulary word (Griffin & Harley, 1996; Mondria & Wiersma, 2004; Schneider et al., 2002; Stoddard, 1929; Waring, 1997; Webb, 2009). Learners performed better when the test was congruent with the direction of learning (tested in the same direction of learning) than when it was incongruent (tested in the reverse direction of learning) (Stoddard, 1929; Griffin & Harley, 1996). Our current findings confirm our hypotheses and provide further support for the idea that directional reading habits have an affect on performance in perceptual-motor tasks. Our finding is not consistent with previous studies regarding the congruent effect (Stoddard, 1929; Griffin & Harley, 1996). In fact, there were no significant differences regardless of whether the direction of the tests was congruent or incongruent with the direction of learning. This perhaps is due to the characteristics of the Arabic reading/writing system, which is entirely right to left, the complete opposite direction of Indo-European languages.

However, our result regarding gender differences is inconsistent with the existing literature, which indicates no clear difference between females and males in learning a second language, although the genders use language and learning strategies in different ways (Maghsudi, Sharifi & Abedi, 2015).

LIMITATIONS AND DIRECTION FOR FUTURE RESEARCH

This study had some limitations that should be taken into consideration when generalizing the results. First, the participants of the study are Arabic-speaking English learners who already have developed reading and writing habits from the right to the left direction in their native language, so generalization of the results should include only learners who have developed reading habits from right to left before learning English. Therefore, generalizing the findings to a larger population with different native languages or cultural backgrounds may be limited. In addition, it should be noted that in this study, the number of participants was small and limited to those who voluntarily participated. Thus, it is possible that the results of the study were affected by motivation bias.

Another explanation for our main results, the finding that Group 2 (Arabic-English) numerically outperformed Group 1 (English-Arabic), is that Group 2 had an order effect (practice effect) from the first session and the Group (2) participants were familiar with the type of the test. Because they were aware of the purpose of the experiment during the first session, they may have been influenced in their behavior in the second test. The results should be qualified by the fact that they will be based on an immediate test, not on a delayed test. Therefore, suggestions for future research would be to design four groups instead of only two groups and to test the directionality effect on an immediate retention test and on a delayed test to see if the results are different.

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Appendix A

barb	تعليق لاذع
matron	رئيسة الممرضات
geyser	سخانة ماء/ نبع حار
fowl	طير
amputee	مبتور أحد الأطراف
prick	وخزة
acumen	الفطنة
smock	سترة/ جلباب
churn	زبدة/ مخضة اللبن
collie	كلب ضخم
sorbet	مثلج الفواكة
derision	السخرية
goon	الابله
curd	تخثر اللبن
stasis	التوازن
cachet	الختم
inferno	الجحيم
steppes	السهول
paragon	نموذج مثالي
galde	جزء من الغابة خالي من الأشجار

ouster	الابعاد
monsoon	الرياح الموسمية
earmark	علامة مميزة
gusto	التذوق
bigot	المتعصب
flint	صخر الصوان
grotto	الكهف
pathos	الشفقة
beater	مخفقة البيض
sneer	الاحتقار
sequin	الترتر
misfits	عدم الملائمة
pacemaker	جهاز منظم دقات القلب
burlap	نسيج الخيش
orator	خطيب المواعظ
hacienda	المبنى الكبير
bulwark	الحصن
moccasin	الخُفّ
unanimity	الإجماع بالرأي
sloth	حيوان الكسلان