Second Language Arabic Knowledge Useful for Learning Hebrew Vocabulary

Kazuhito Uni[*]

Faculty of Cultural Sciences, Universitas Gadjah Mada, Yogyakarta, Indonesia

Abstract—**Arabic and Hebrew belong to the Semitic branch of the Afroasiatic language family, and thus, they are semantically and phonetically similar in many lexical aspects. This study examined the benefits of Malaysian university students having prior knowledge of Arabic while learning Hebrew. A two-page questionnaire was administered to two groups of 30 and 40 students at advanced and fundamental Arabic proficiency levels, respectively. Page 1 contained a checklist with Yes/No columns about 30 Hebrew words to examine the participants' prior knowledge. If participants answered yes, they were asked to write the meaning of the word in English or Malay. They then answered multiple-choice questions about the 30 Hebrew words on Page 2. Arabic counterparts were not shown on the questionnaire to prevent cuing the participants. The first group of participants, 30 Malaysian students with advanced Arabic proficiency, learned an average of 23.07 Hebrew words. The vocabulary items most correctly identified by Group 1 were *'olam* "world" (30 correct answers), *katavti* "I wrote" (28), *mavet* "death" (28), *melekh* "king" (27), *moakh* "brain" (27), *shabat* "Saturday" (27), *shen* "tooth" (27), *shamayim* "sky" (26), *shana* "year" (26), *ahavti* "I loved" (26), and *ozen* "ear" (26). The second group, 40 Malaysian students with basic Arabic knowledge, acquired 12.83 words on average. The scores of the two groups differed with statistical significance at the 5% level ($p < 0.001$, $df = 68$, $t = 14.26$). From these results, it appears that Arabic lexical knowledge significantly facilitates Malaysian students' acquisition of Hebrew vocabulary.**

Index Terms—**Arabic, Hebrew, phonetics, semantics, similarity**

I. INTRODUCTION

A. Significance of Arabic Proficiency in Malaysian Muslim Society

Arabic is the predominant language in Islam, and Muslim Malaysian pupils usually learn Arabic starting in the first year of primary school or earlier. Secondary school students in the Islamic stream must attend advanced Arabic classes in the fourth and fifth years, and most obtain advanced-level proficiency in the language (Ministry of Education Malaysia, 2018). In contrast, non-Muslim Malaysians seldom learn Arabic, and they tend to focus on their English proficiency due to economic globalization. Renganathan (2021) emphasizes that many Malaysian students expect advanced-level English proficiency to enrich and stabilize their future lives. Pillai and Ong (2018) highlight that many Malaysians, who speak Malaysian English or "Manglish," consider it part of their identity. Phoon et al. (2013) stress that Malaysians' first languages (L1), such as Malay, Mandarin, Cantonese, and Tamil, strengthen the original features of each ethnic group's English variety. However, few studies have suggested the advantages of Arabic knowledge for foreign language learning by Malaysian students. This study hypothesizes that knowledge of Arabic as a second language (L2) among Malaysian students has considerable potential benefits for learning foreign languages, particularly Hebrew, which shares an identical etymological root for its vocabulary.

B. Arabic Loanwords in Malay

There are thousands of Arabic words in Malay, such as the Malay *maklumat* "information" from the Arabic *ma'lūmāt* (IPA: [maʕluːmaːt]) "information," Malay *adat* "custom" from the Arabic *'āda(t)* (IPA: [ʕaːda(t)]) "custom," Malay *umur* "age" from the Arabic *'umr* (IPA: [ʕumr]) "age," Malay *sabar* "patient" from the Arabic *ṣabr* (IPA: [sˤabr]) "patience," and *kubur* "grave" from the Arabic *qubūr* (IPA: [qubuːr]) "graves," which are frequently used in daily communication in Malay. Several Arabic consonants, such as '(IPA: [ʕ]), *ṣ* (IPA: [sˤ]), and *q* (IPA: [q]), which do not exist in Malay, had previously been simplified. Uni (2015) conducted a survey on 40 basic Malay vocabulary items, including the Malay *adat* "custom," *kubur* "grave," and *sabar* "patient" with 20 Arabic-speaking students who were studying at a major Malaysian university but had almost no prior knowledge of Malay when answering the two-page questionnaire survey. The first page was a checklist to confirm each participant's prior knowledge about 40 questioned Malay words; the second page included multiple-choice questions about the listed words along with their etymology in Arabic. On average, the participants correctly identified 24.4 Malay words and learned 17.6 vocabulary items. A significant difference was observed between the number of words identified before and after the presentation of

---

[*] Corresponding Author. Email: kazuhito.uni@gmail.com

etymological information. The participants' knowledge of Arabic as their first language (L1) considerably assisted their learning of the listed Malay words.

Uni (2022) administered a similar questionnaire survey with the same Malay words; however, the participants for this second study were 20 Persian-speaking university students. Historically, Persian also contains numerous Arabic words due to the Islamization of the Persians, so most Persian speakers have a basic Arabic lexical knowledge even without studying Arabic. More than half of the queried Malay words were similar to Persian words of Arabic origin. On average, the Persian-speaking respondents correctly identified 19.9 Malay words and learned 17.35 vocabulary items, and a significant difference was observed after an explicit presentation of etymological information on Page 2 of the questionnaire. Based on the results of the previous studies, this study hypothesizes that knowledge of Arabic might foster understanding of loanwords in Malay among those who speak the language as L2.

C. Similarities Between Arabic and Hebrew

Arabic and Hebrew belong to the Semitic branch of the Afroasiatic language family (Crystal, 2010). Modern Standard Arabic retains imperfect and perfect forms in the indicative, subjunctive, and jussive moods (Ryding, 2005). Similarly, the imperfect and perfect aspects are a major distinction in Biblical Hebrew, spoken more than 2,000 years ago; however, Modern Hebrew primarily uses the present, past, and future tenses (Glinert, 2015). Thus, few grammatical similarities are observed between Arabic and Modern Hebrew. In this article, the International Phonetic Alphabet (IPA) is used to indicate Arabic pronunciation accurately. Modern Standard Arabic and Modern Hebrew do, however, retain lexical similarities, such as Arabic *yad* (IPA: [jad]) and Hebrew *yad* "hand"; Arabic *yawm* (IPA: [jawm]) and Hebrew *yom* "day"; and Arabic *'ayn* (IPA: [ʕajn]) and Hebrew *'ayin* "eye". These words, which are phonetically and semantically almost identical, were not used for the questionnaire survey in this study.

Apart from loanwords, Hebrew words are generally derived from consonantal roots that are related to specific concepts. For example, the root with the three consonants *k/kh*, *t*, and *b/v* has a holistic meaning of "write," such as the Hebrew *katav* "he wrote," *katavti* "I wrote," *ktiva* "writing" as a noun, and *mikhtav* "letter" as a written message. The Hebrew letter *kaf* is pronounced *k* or *kh*, depending on the word. A similar phonetic alternation is observed between [b] and [v], which are spelled with the Hebrew letter *beth*. Similar to the group of Hebrew words mentioned above, the Arabic *kataba* (IPA: [kataba]) "he wrote," *katabtu* (IPA: [katabtu]) "I wrote," *kitāb* (IPA: [kita:b]) "book," and *kitāba(t)* (IPA: [kita:ba(t)]) "writing" are derived from the Arabic consonantal root *k-t-b*, which is related to acts of writing. However, the Hebrew word *sefer* "book" is not related to the Hebrew root *k/kh-t-b/v*. While Arabic-speaking learners cannot coin Hebrew words reflexively, Arabic and Hebrew vocabularies show considerable resemblance in terms of semantic scope. Furthermore, the Hebrew nouns *limud* "learning, study" and *bikur* "visit" as a noun include the roots *l-m-d* "learn" and *b-k-r* "visit," respectively. The Hebrew *talmid* and Arabic *tilmīdh* (IPA: [tilmi:ð]), both of which mean "pupil," also retain phonetic and semantic similarities.

D. Benefits of Hebrew Lexical Knowledge for Arabic Speakers

Malaysian Muslims study Arabic for religious purposes; however, most of them do not frequently analyze the etymology of Arabic vocabulary. Languages do not exist in isolation but retain etymological associations. When given the opportunity to compare Hebrew words that share an etymology with their Arabic equivalents, Malaysian Arabic learners can become more aware of the similarities between Arabic and another foreign language, as well as deepening their understanding of the morphological, phonetic, and semantic aspects of Arabic. These two points would be the primary benefits of enriching Hebrew lexical knowledge among Malaysian Muslims.

E. Significance of Relativizing Own Thought

English and many other international languages are learned regardless of learners' thoughts, viewpoint, and identity. Non-Muslims also learn Arabic for academic, commercial, and cultural purposes. When learning a foreign language, learners can often compare different viewpoints and relativize their thoughts and values. This process enhances learners' linguistic and cultural consciousness, as well as increasing respect for other languages, cultures, and religions.

F. Objective

This study investigated the benefits of Arabic knowledge among Malaysian university students in learning Hebrew vocabulary that shares semantic and phonetic similarities with Arabic terminology of identical origin.

II. LITERATURE REVIEW

A. Significance of Hebrew for Judaism and Christianity

Hebrew is inseparably associated with Judaism because it is the primary language of the Hebrew Bible (also called the Old Testament by Christians), Judaism's holy scripture (Goodman, 2018). Although their religious practices vary, Jewish people around the world learn Hebrew to maintain their religious, cultural, and ethnic identity (Walters, 2019). In addition, Jewish academic institutions in America, Europe, and other regions have also encouraged their students, depending on their interests, to deepen their understanding of Hebrew and Jewish culture. Furthermore, Mintz (1993) described the development of Hebrew education in America, including an increase in Hebrew courses in tertiary

institutions. Eliezer Ben-Yehuda and other linguists have contributed significantly to the establishment of Modern Hebrew (Sáenz-Badillos, 1996). In Israel, intensive Hebrew courses for adult immigrants are offered at schools called *Ulpan* (plural *Ulpanim*). There, learning Hebrew as the lingua franca strengthens new immigrants' ethnic identity and their solidarity with other Jewish citizens (Glass, 2018).

Hebrew courses are offered in various Christian academic institutions, including American universities, such as Texas Christian University and Southern Methodist University in Texas, Wheaton College in Illinois, Pepperdine University in California, and Harding University in Arkansas. Biblical Hebrew is a crucial field of study to accurately analyze linguistic, historical, and cultural contexts in the Bible. Joosten (2005) analyzed syntactic characteristics of Classical and Late Biblical Hebrew and demonstrated its primary differences. Anderson and Widder (2018) concisely explain the essence of critical biblical analyses. Reading of the Old Testament's Hebrew version enables students to compare identical texts in different languages and deepen their comprehension of grammatical, morphological, and semantic features of the Hebrew language (Kelley & Crawford, 2018). English word concepts, for instance "love," "mercy," and "generosity," partially differ from their Hebrew equivalents: the Hebrew term *chesed*, *khesed*, or *ḥesed* is translated as "mercy," "loving kindness," "kindness," or "love" in a classical English version. Hebrew learners who can recognize terms' original spelling can more deeply comprehend the whole concept as a unit, regardless of a translator's choices that conform to each sentence's biblical context.

B. Recent Studies on Hebrew Vocabulary and Phonology

Uni (2018) investigated high-frequency Modern Hebrew vocabulary of Latin and Greek origins, examining its advantage for learning basic Hebrew. For example, the Hebrew nouns *biologiya* "biology," *psikhologiya* "psychology," and *sotsiologiya* "sociology" regularly contain the Greek-origin suffix *-logiya*, which corresponds to the English suffix *-logy*. Learners aware of such similarities can often manage their language learning more efficiently than those who are not familiar with them.

A considerable number of Hebrew words were loaned from European languages (Ringvald et al., 2015). Although Hebrew does not belong to the Indo-European language family, many international loanwords resemble their equivalents in English, Russian, German, and other European languages. Before the Holocaust, Yiddish, a variety of the German language, had been widely spoken among Jewish people in Germany, Austria, Poland, Russia, etc. (Shandler, 2020). Historically, it had loaned thousands of Hebrew words; in the modern age, however, Yiddish contributed considerably to the revival of the Hebrew language by Yiddish-speaking Zionists (Kriwaczek, 2006).

Studies on language acquisition of Hebrew speakers are increasing in Israel and several other countries. Segal et al. (2016) examined the influence of the listening experience of 128 Hebrew and Arabic-learning infants on the distinction between [ba] and [pa]. The consonant [p] is not included in conventional Arabic phonemes, and [b] is included in loanwords such as [biːtzaː] "pizza" and [ʔabriːl] "April." Among the participants in Segal et al.'s study, 4- to 6-month-old infants could distinguish between [b] and [p] regardless of their native language, whereas 10- to 12-month-old babies learning Arabic ceased to distinguish the two phonemes. The comparative observation in Segal et al. (2016) is an excellent example of research that connects Hebrew and Arabic studies.

C. Utility of Similarities Between L1 and L2 for Language Acquisition

Corder (1993) highlighted the value of learners' L1 as the foundation for L2 learning, hypothesizing that, during their acquisition process, L2 learners accelerate their learning by frequently borrowing their L1 vocabulary and grammar. Ringbom (2007) emphasized that orthographical and phonetic similarity effectively fostered the lexical learning of an etymologically related language. Ringbom (2012), who contrastively analyzed the language output by Finnish and Swedish speakers, suggested that lexical studies with a focus on cross-linguistic similarities that include etymological associations can suggest various improvements to current practices of foreign language instruction. Poort and Rodd (2017) examined the usefulness of etymologically shared Dutch and English words (hereafter "cognates") for the English vocabulary identification of 41 native Dutch speakers who are fluent in English and statistically compared their average decision time for cognates and noncognates. Their results showed a statistically significant difference in decision time records between the two lexical categories, and the use of cognates was deemed effective for English language instruction to speakers of an etymologically close L1.

Most Hebrew letters, such as *gimel* ([g]), *daleth* ([d]), *zayin* ([z]), *teth* ([t]), *mem* ([m]), and *nun* ([n]), are phonetically transparent because they indicate the sole consonant sound. In addition, several letters, such as *daleth* and *mem*, which may originate from the Hebrew *delet* "door" and *mayim* "water," respectively, retain phonetic resemblance to their etymology. Treiman et al. (2007) compared difficulties faced by 645 Israeli children around the age of 5 when learning Hebrew and English letter names, and the results highlighted that the lesser phonetic similarities among Hebrew letter names compared with those among English ones facilitated the participants' learning. Ashkenazi et al. (2016) explored the acquisition of Hebrew verbs, which are mainly conjugated based on a root of three consonants; their findings provided an extensive description of root types and temporal categories. Arabic words are also derived based on similar consonant roots, and thus, their research may contribute to Arabic vocabulary instruction. Bar-On and Ravid (2011) analyzed the role of morphology in primary school pupils' learning to read unvocalized Hebrew. The participants were 171 Hebrew-speaking primary and secondary school students. Its results clarified that ages 7 and 8 are crucial for

learning an effective recognition of unvocalized Hebrew words. Their findings may provide useful suggestions applicable for Arabic instruction.

Abu-Rabia (2002) examined social and cognitive factors that influence the reading comprehension of Arabic-speaking students learning Hebrew in Israel. The participants were 74 Arab students aged 14 or 15, and their degree of comprehension frequently diminished with culturally unfamiliar topics. The majority of Hebrew texts in Israel may be written by Jewish citizens and may convey thoughts and values with which Muslims cannot agree. Furthermore, cultural, social, and political issues in Israel are hardly described from a neutral standpoint. Selecting culturally neutral L2 texts might allow learners to concentrate on the content. The main purpose of L2 reading comprehension should be distinguished from production activities, including writing exercises and oral discussions.

Although the abovementioned studies regarding native Hebrew or Arabic speakers are significantly beneficial, few studies focus on Hebrew learning among non-native Arabic speakers with an intermediate or advanced level of knowledge of Arabic vocabulary. This research gap is a major factor that inspired the author of this study to examine Hebrew vocabulary learning among Malaysian Muslim students.

III. METHODOLOGY

A. Participants

The first group of participants contained 30 Malaysian students, who had completed the subject advanced Arabic during secondary school. The second group contained 40 Malaysian students, who had learned basic Arabic during secondary school. The participants were studying at two different Malaysian universities.

B. Hebrew Words Used in the Present Study

The Hebrew words used for the present study share certain phonetic or semantic similarities to their Arabic counterparts. For example, Hebrew *'olam* and Arabic [ʕaːlam] both mean "world". The voiced pharyngeal fricative [ʕ] is pronounced in Modern Standard Arabic but is often omitted or pronounced as a glottal stop (IPA: [ʔ]) in Modern Hebrew. Another example would be Hebrew *katavti* and Arabic [katabtu], which both mean "I wrote." The Arabic consonant [b] usually corresponds to [b] or [v] in Hebrew, depending on the word. The Arabic ending [tu] and Hebrew ending *-ti* both indicate an action by a singular first person that was completed in the past. The *s* sound in many Arabic words corresponds to the *sh* sound ([ʃ]) in Hebrew—for example, the Arabic [sana(t)] and the Hebrew *shana*, both of which mean "year." Moreover, the voiced velar plosive [g] in Hebrew corresponds to the Arabic [dʒ] (*j*)—for example, the Arabic [dʒaliːd] "ice" and the Hebrew *glida*, meaning "ice cream." The Hebrew letter *vav*, which corresponds etymologically to the Arabic letter *wāw*, is pronounced [v] in Modern Hebrew. For instance, the Arabic [mawt], meaning "death," is equivalent to the Hebrew *mavet*, which has the exact same meaning. It may therefore be relatively easy for advanced-level Arabic speakers to analyze and recognize phonetic and semantic correspondences in Hebrew words. Arabic counterparts were not shown on the questionnaire to prevent cuing the participants and to maintain the reliability of the test results.

C. Details of the Questionnaire

The questionnaire used in this study consisted of two pages, as shown in Tables 1 and 2. Page 1 was a checklist with Yes/No columns about 30 Hebrew words to examine participants' prior knowledge. If they answered yes, they were asked to write the meaning of the word in English or Malay. After the participants completed the items on Page 1, they were provided with a brief explanation of the phonetic similarities between Hebrew and Arabic in Table 3 and then answered multiple-choice questions on the 30 Hebrew words on Page 2. Each participant was given 50 minutes to complete the questionnaire.

TABLE 1
EXCERPT FROM PAGE 1 OF THE QUESTIONNAIRE

Checklist		
Do you know the meaning of the following words? If not, please circle No only. If you do know the word, please circle Yes and write its possible meaning in Malay or English. I would appreciate your kind cooperation.		
1. akhalti	Yes/No	Possible meaning: ( )
2. katavti	Yes/No	Possible meaning: ( )
3. ahavti	Yes/No	Possible meaning: ( )
4. shavua'	Yes/No	Possible meaning: ( )
5. shana	Yes/No	Possible meaning: ( )
6. shemesh	Yes/No	Possible meaning: ( )

TABLE 2
EXCERPT FROM PAGE 2 OF THE QUESTIONNAIRE

Multiple-question quiz on fundamental Hebrew vocabulary			
Instructions: Please select a, b, or c and write your answer in ( ).			
1. akhalti	a. I saw	b. I drank	c. I ate	( )
2. katavti	a. I listened	b. I wrote	c. I spoke	( )
3. ahavti	a. I knew	b. I loved	c. I had	( )
4. shavua'	a. week	b. month	c. season	( )
5. shana	a. day	b. minute	c. year	( )
6. shemesh	a. star	b. moon	c. sun	( )
7. sheleg	a. rain	b. snow	c. cloud	( )
8. shamayim	a. name	b. sky	c. space	( )
9. 'etsem	a. body	b. head	c. bone	( )
10. glida	a. milk	b. ice cream	c. cream	( )

TABLE 3
BRIEF EXPLANATION OF PHONETIC SIMILARITIES BETWEEN HEBREW AND ARABIC

The Hebrew letter *beth* is pronounced [b] or [v], depending on the word− for example, the Hebrew *av* or *aba*, "father."

The Hebrew letter *vav*, which corresponds etymologically to the Arabic letter *wāw*, is pronounced [v] in Modern Hebrew.

The *s* sound in many Arabic words corresponds to the *sh* sound ([ʃ]) in Hebrew− for example, the Arabic *sab'a(t)* and the Hebrew *sheva'*, both of which mean "seven."

The Hebrew letter *kaf* is pronounced as [k] or [x] (*kh*), depending on the word− compare the Arabic *-ka* and the Hebrew *-kha* [xa]; both are masculine suffixes, meaning "your."

The Hebrew letter *khet* is pronounced [x] (*kh*) and corresponds to the Arabic [ħ] (*ḥ*) and [x] (*kh*)− for example, the Arabic *ḥalīb* and the Hebrew *khalav*, both meaning "milk"; the Arabic *khamsa(t)* and the Hebrew *khamesh*, both of which mean "five."

The Hebrew letter *gimel* is pronounced [g] and corresponds to the Arabic [dʒ] (*j*)− compare the Arabic *zawj* and the Hebrew *zug*, both meaning "couple."

IV. DATA ANALYSIS

A. Respondents' Scores

The first group of participants, the 30 Malaysian students with advanced Arabic proficiency, learned an average of 23.07 Hebrew words; the second group, the 40 Malaysian students with basic Arabic knowledge, acquired 12.83 words on average. Microsoft Excel Version 2304 was used to perform statistical analyses of these data. At a 5% level, the two groups' scores showed statistically significant differences ($p < 0.001$, $df = 68$, $t = 14.26$). Table 4 presents the details of the respondents' scores. Tables 5 and 6 present the numbers of words learned by each respondent in Group 1 or 2, respectively.

TABLE 4
RESPONDENTS' SCORES

	Group 1	Group 2
Mean	23.07	12.83
Standard Deviation	10.13	7.89
Total Number	30	40
t-Value	14.26	
p-Value	< 0.001	

TABLE 5
NUMBER OF WORDS LEARNED BY EACH RESPONDENT IN GROUP 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
17	19	19	20	20	20	20	20	20	21	22	22	22	22	23	23	23	23	23	24
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**										
24	25	26	27	27	27	27	28	28	29										

TABLE 6
NUMBER OF WORDS LEARNED BY EACH RESPONDENT IN GROUP 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
8	9	9	9	9	9	10	10	11	11	11	11	11	11	12	12	12	12	12	13
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
13	13	13	13	13	14	14	14	14	14	14	16	16	16	16	16	17	17	18	20

B. The Most Correctly Identified Words

All 30 participants in Group 1 had not known the meaning of *'olam* "world" prior to answering the questions on Page 2, but they correctly identified its meaning. In addition, 28 respondents from Group 1 successfully guessed the meaning of *katavti* "I wrote" and *mavet* "death," which are equivalent to Arabic [katabtu] "I wrote" and [mawt] "death," respectively; the phonetic differences between Hebrew [v] and Arabic [b]/[w] only hindered identification by two

participants. The words *melekh* "king," *moakh* "brain," *shabat* "Saturday," and *shen* ("tooth") were correctly identified by 27 students. The Hebrew noun *melekh* "king" and its Arabic counterpart *malik* end with *kh* and [k], respectively, which only confused three respondents. The Hebrew *moakh* "brain" and its Arabic equivalent [mu:x] "brain" share the consonants [m] and [x]; the vowels in these words were a major obstacle for three respondents. One participant correctly identified *shabat* "Saturday" while filling in the checklist on Page 1 as the Malay noun *Sabtu* "Saturday," of Arabic origin, may have been a clue. A further 27 people learned the words *shabat* "Saturday" and *shen* "tooth" through the quiz on Page 2. Similarities between the Hebrew *shen* and Arabic [sinn], both of which mean "tooth," encouraged most participants to guess the correct meaning. The Hebrew *shamayim* "sky" and Arabic [sama:ʔ] "sky" also retain certain similarities, as do the Hebrew *shana* and its Arabic counterpart [sana(t)] "year".

TABLE 7
HEBREW WORDS MOST CORRECTLY IDENTIFIED BY RESPONDENTS IN GROUP 1

Number of Correct Answers (*n* = 30)	Hebrew Words	Their Arabic Counterparts
30	*'olam* "world"	[ʕa:lam] "world"
28	*katavti* "I wrote"	[katabtu] "I wrote"
28	*mavet* "death"	[mawt] "death"
27	*melekh* "king"	[malik] "king"
27	*moakh* "brain"	[mu:x] "brain"
27	*shabat* "Saturday"	[sabt] "Saturday"
27	*shen* "tooth"	[sinn] "tooth"
26	*shamayim* "sky"	[sama:ʔ] "sky"
26	*shana* "year"	[sana(t)] "year"
26	*ahavti* "I loved"	[ʔaħbabtu] "I loved"
26	*ozen* "ear"	[ʔuðun] "ear"

The Arabic verb form [ʔaħbabtu] "I loved," corresponding to the Hebrew *ahavti* "I loved," facilitated identification by 26 participants. These cases indicate that the difference between Hebrew *sh* and Arabic [s] or between Hebrew *h* and Arabic [ħ] did not considerably confuse learners. The consonantal difference between *z* in Hebrew *ozen* "ear" and [ð] in Arabic [ʔuðun] also did not affect most participants.

TABLE 8
HEBREW WORDS MOST CORRECTLY IDENTIFIED BY RESPONDENTS IN GROUP 2

Number of Correct Answers (*n* = 40)	Hebrew Words	Their Arabic Counterparts
25	*mavet* "death"	[mawt] "death"
24	*shabat* "Saturday"	[sabt] "Saturday"
24	*khayim* "life"	[ħaja:(t)] "life"
22	*akhalti* "I ate"	[ʔakaltu] "I ate"
22	*khalom* "dream"	[ħulm] "dream"
21	*tsohorayim* "noon"	[ðˤuhr] "noon"
20	*'etsem* "bone"	[ʕaðˤm] "bone"
20	*shamayim* "sky"	[sama:ʔ] "sky"
19	*katavti* "I wrote"	[katabtu] "I wrote"
19	*ahavti* "I loved"	[ʔaħbabtu] "I loved"
19	*melekh* "king"	[malik] "king"

Among the Hebrew words in Table 8, *khayim* "life" (24 correct responses), *akhalti* "I ate" (22), *khalom* "dream" (22), *tsohorayim* "noon" (21), and *'etsem* "bone" (20) were not among the words most correctly identified by respondents in Group 1. Instead, Table 7 includes *'olam* "world" (30 correct answers), *moakh* "brain" (27), *shen* "tooth" (27), and *shana* "year" (26). Differences in Arabic vocabulary knowledge between the two groups affected the participants' identification of the listed Hebrew words. Semantic and phonetic similarities shared with the Arabic [ʕa:lam] "world," [mu:x] "brain," [sinn] "tooth," and [sana(t)] "year" may have more obviously helped Group 1 participants identify their Hebrew equivalents.

C. The Most Difficult Words

The Hebrew words that most commonly confused Group 1 were *'etsem* "bone," *se'ar* "hair," and *tsipor* "bird," which correspond to Arabic [ʕaðˤm] "bone," [ʃaʕ(a)r] "hair," and [ʕusˤfu:r] "small bird, sparrow," respectively. Phonetic differences in not only vowels but also consonants appeared to confuse half of the participants. First, the etymological correspondence between Hebrew *ts* and Arabic [ðˤ] made it difficult to guess the correct meaning. Although the correspondence between Hebrew *sh* and Arabic [s] in the most correctly identified words had limited negative effects, the correspondence between Hebrew *s* and Arabic [ʃ] confused 16 respondents.

The Arabic noun [ʕusˤfu:r] "small bird, sparrow," which corresponds to Hebrew *tsipor* "bird," is based on the consonant root [sˤ]-[f]-[r]; however, an etymologically irrelevant addition of [ʕ] to the first syllable of the Arabic word diminished participants' comprehension. The Hebrew word *lev* "heart" and its Arabic counterpart *lubb* "core" diverge

semantically, which negatively affected 15 respondents. The incorrect option "love" on the multiple-choice question on Page 2 also misled some participants.

The Hebrew noun *gan* "garden" includes a *g*, which corresponds to [dʒ] (English *j*) in Arabic; however, the broad semantic scope of the Arabic noun [dʒanna(t)] "paradise, garden" may have prevented their semantic identification. The Hebrew noun *glida* "ice cream" and its Arabic etymological counterpart [dʒaliːd] "ice" share an identical consonantal correspondence that enabled 20 participants to successfully identify the meaning of *glida*. The cross-linguistic pair *erets* "country, land" and [ʔardˤ] "land, earth" was comprehensible for 20 students, as these words retain a certain semantic similarity.

TABLE 9
HEBREW WORDS LEAST CORRECTLY IDENTIFIED BY RESPONDENTS IN GROUP 1

Number of Correct Answers (n = 30)	Hebrew Words	Their Arabic Counterparts
14	*'etsem* "bone"	[ʕaðˤm] "bone"
14	*se'ar* "hair"	[ʃaʕ(a)r] "hair"
14	*tsipor* "bird"	[ʕusˤfuːr] "small bird, sparrow"
15	*lev* "heart"	[lubb] "core"; (semantic equivalent) [qalb] "heart"
16	*gan* "garden"	[dʒanna(t)] "paradise, garden"; (semantic equivalent) [ħadiːqa(t)] "garden, park"
20	*glida* "ice cream"	[dʒaliːd] "ice"; (semantic equivalent) [buːðˤa(t)] "ice cream"
20	*erets* "country, land"	[ʔardˤ] "land, earth"; (semantic equivalent) [balad] "country"
20	*khayim* "life"	[ħaja:(t)] "life"
22	*khalom* "dream"	[ħulm] "dream"
22	*beytsa* "egg"	[bajdˤa(t)] "egg"
22	*merkaz* "center"	[markaz] "center"

The Hebrew noun *khayim* and its Arabic counterpart [ħaja:(t)] both mean "life." In addition to their semantic similarities, the existence of the Arabic-origin Malay word *hayat* "life" may have assisted 20 participants in identifying the meaning of *khayim*. The correspondence between Hebrew *kh* and Arabic [ħ] can also be observed between *khalom* and [ħulm], which share the meaning "dream." More obvious phonetic similarities are shared between *beytsa* and [bajdˤa(t)] "egg" as well as between *merkaz* and [markaz] "center".

TABLE 10
HEBREW WORDS LEAST CORRECTLY IDENTIFIED BY RESPONDENTS IN GROUP 2

Number of Correct Answers (n = 40)	Hebrew Words	Their Arabic Counterparts
7	*lev* "heart"	[lubb] "core"; (semantic equivalent) [qalb] "heart"
7	*se'ar* "hair"	[ʃaʕ(a)r] "hair"
9	*ozen* "ear"	[ʔuðun] "ear"
10	*shavua'* "week"	[ʔusbuːʕ] "week"
11	*mafteakh* "key"	[miftaːħ] "key"
12	*beytsa* "egg"	[bajdˤa(t)] "egg"
13	*merkaz* "center"	[markaz] "center"
14	*tsipor* "bird"	[ʕusˤfuːr] "small bird, sparrow"
15	*glida* "ice cream"	[dʒaliːd] "ice"; (semantic equivalent) [buːðˤa(t)] "ice cream"
16	*gan* "garden"	[dʒanna(t)] "paradise, garden"; (semantic equivalent) [ħadiːqa(t)] "garden, park"

Among the Hebrew words in Table 10, *ozen* "ear" (9 correct responses), *shavua'* "week" (10), and *mafteakh* "key" (11) were not included in the words that most commonly confused respondents in Group 1, which instead contained *erets* "country, land," *khayim* "life," and *khalom* "dream." When answering Page 2 of the questionnaire survey, most Group 1 participants successfully remembered the Arabic words [ʔuðun] "ear," [ʔusbuːʕ] "week," and [miftaːħ] "key," so the identification of their Hebrew counterparts was relatively easy.

D. Other Words in the Vocabulary Survey

A total of 23 respondents in Group 1 accurately identified the Hebrew noun *mafteakh* "key", which corresponds to the Arabic word [miftaːħ]. The root consonants of these two words remain almost identical, *p/f-t-kh* in Hebrew and [f]-[t]-[ħ] in Arabic. The same number of participants also chose the correct meaning for Hebrew *shavua'* "week," corresponding to the Arabic [ʔusbuːʕ]. The Hebrew *shama'ti* "I heard" received 24 correct answers. The

correspondence between *sh* and [s] appeared to benefit most participants. The Hebrew *tsohorayim* and its Arabic counterpart [ðˤuhr] "noon" share the consonants [h] and [r]. The Arabic-origin Malay noun *Zohor* or *Zuhur* "*Dhuhr* Muslim prayer" also helped the participants to identify the meaning. Four participants in Group 1 successfully guessed the meaning of *akhalti* "I ate," similar to Arabic [ʔakaltu] with the same meaning, when filling in Page 1 of the questionnaire. A total of 25 participants accurately guessed the meaning of *akhalti* "I ate," *etsbaʻ* "finger," *sheleg* "snow," and *shemesh* "sun." The cross-linguistic phonetic correspondence between *ts* and [sˤ] allowed most participants to identify *etsbaʻ* "finger".

TABLE 11
NUMBER OF GROUP 1 CORRECT ANSWERS FOR OTHER HEBREW WORDS

Number of Correct Answers (*n* = 30)	Hebrew Words	Their Arabic Counterparts
23	*mafteakh* "key"	[miftaːħ] "key"
23	*shavuaʻ* "week"	[ʔusbuːʕ] "week"
24	*shamaʻti* "I heard"	[samiʕtu] "I heard"
24	*tsohorayim* "noon"	[ðˤuhr] "noon"
25	*akhalti* "I ate"	[ʔakaltu] "I ate"
25	*etsbaʻ* "finger"	[ʔisˤbaʕ] "finger"
25	*sheleg* "snow"	[θaldʒ] "snow"
25	*shemesh* "sun"	[ʃams] "sun"

V. DISCUSSION

Phonetic similarities in the first and second syllables particularly helped most participants identify the correct word meaning, as, for example, in the Hebrew words *shamayim* "sky" ([samaːʔ] in Arabic) and *katavti* "I wrote" ([katabtu] in Arabic), for which the different syllables at the end did not impede most participants' identification. Moreover, regularity in phonetic similarity between Hebrew [v] and Arabic [b]/[w], [ʃ] (*sh*) and [s], [ts] and [sˤ], and [x] (*kh*) and [k]/[ħ]/[x] was significantly beneficial for the respondents to notice certain phonetic correspondences. However, the correspondence between Hebrew [ts] and Arabic [ðˤ] in the Hebrew *tsohorayim* "noon" and Arabic [ðˤuhr] "noon" did not considerably raise linguistic consciousness.

The Hebrew *lev* "heart," which etymologically corresponds to the Arabic *lubb* "core" and has *qalb* "heart" as its semantic equivalent, was successfully identified by only 15 and 7 participants in Groups 1 and 2, respectively. The meaning of *tsipor* "bird," whose Arabic etymological counterpart is [ʕusˤfuːr] "small bird, sparrow," was correctly guessed by 14 participants in both groups. The limited number of correct answers for these two Hebrew words indicates that semantic similarities are also essential for identification. The other 28 Hebrew words retained more obvious semantic similarity, and this assisted the participants in selecting the correct meaning.

The possible existence of other variables is a primary limitation of this study. Differences in socio-economic backgrounds between Groups 1 and 2 may have influenced the results. To allow a detailed analysis, more information could be sought from each participant, including the duration of Arabic learning, past travel experience in Arab countries, and other relevant experience.

VI. CONCLUSION

This study examined the benefits of Arabic lexical knowledge among Malaysian university students for learning Hebrew vocabulary that shares certain semantic and phonetic similarities to the Arabic equivalents. On average, the participants in Group 1, the 30 Malaysian students with advanced Arabic proficiency, learned 23.07 Hebrew words on average, while those in Group 2, the 40 Malaysian students with basic Arabic knowledge, acquired 12.83 words on average. The two groups' scores differed with statistical significance ($p < 0.001$, $df = 68$, $t = 14.26$). Based on these results, this study concludes that L2 Arabic knowledge significantly facilitates Malaysian students' learning of Hebrew vocabulary.

ACKNOWLEDGEMENTS

REFERENCES

[1]   Abu-Rabia, S. (1998). Social and cognitive factors influencing the reading comprehension of Arab students learning Hebrew as a second language in Israel. *Journal of Research in Reading*, *21*(3), 201–212. https://doi.org/10.1111/1467-9817.00057
[2]   Anderson, A., & Widder, W. (2013). *Textual criticism of the Bible* (revised ed.). Lexham Press.
[3]   Ashkenazi, O., Ravid, D., & Gillis, S. (2016). Breaking into the Hebrew verb system: A learning problem. *First Language*, *36*(5), 505–524. https://doi.org/10.1177/0142723716648865

[4]   Bar-On, A., & Ravid, D. (2011). Morphological analysis in learning to read pseudowords in Hebrew. *Applied Psycholinguistics*, *32*(3), 553–581. https://doi.org/10.1017/S014271641100021X

[5]   Corder, S. P. (1993). A role for the mother tongue. In S. M. Gass & L. Selinker (Eds.), *Language transfer in language learning* (revised ed.) (pp. 18–31). John Benjamins.

[6]   Crystal, D. (2010). *The Cambridge encyclopedia of language* (3rd ed.). Cambridge University Press.

[7]   Glass, J. B. (2018). *From new Zion to old Zion: American Jewish immigration and settlement in Palestine*, 1917-1939. Wayne State University Press.

[8]   Glinert, L. (2015). *Modern Hebrew: An essential grammar* (4th ed.). Routledge.

[9]   Goodman, M. (2018). *A history of Judaism*. Princeton University Press.

[10]   Joosten, J. (2005). The distinction between Classical and Late Biblical Hebrew as reflected in syntax. *Hebrew Studies*, *46*, 327–339. Retrieved May 20, 2023, from https://www.jstor.org/stable/27913754

[11]   Kelley, P. H., & Crawford, T. G. (2018). *Biblical Hebrew: An introductory grammar* (2nd ed.). Eerdmans.

[12]   Kriwaczek, P. (2006). *Yiddish civilisation: The rise and fall of a forgotten nation*. Vintage.

[13]   Ministry of Education Malaysia. (2018). *Kurikulum standard sekolah menengah: Bahasa Arab tingkatan 4 dan 5* [Secondary school standard curriculum: Arabic for Forms 4 and 5]. Ministry of Education Malaysia.

[14]   Mintz, A. (1993). *Hebrew in America: Perspectives and prospects*. Wayne State University Press.

[15]   Phoon, H. S., Abdullah, A. C., & Maclagan, M. (2013). The consonant realizations of Malay-, Chinese- and Indian-influenced Malaysian English. *Australian Journal of Linguistics*, *33*(1), 3–30. https://doi.org/10.1080/07268602.2013.787902

[16]   Pillai, S., & Ong, L. T. (2018). English(es) in Malaysia. *Asian Englishes*, *20*(2), 147–157. https://doi.org/10.1080/13488678.2018.1459073

[17]   Poort, E. D., & Rodd, J. M. (2017). The cognate facilitation effect in bilingual lexical decision is influenced by stimulus list composition. *Acta Psychologica*, *180*, 52–63. https://doi.org/10.1016/j.actpsy.2017.08.008

[18]   Renganathan, S. (2021). English language education in rural schools in Malaysia: A systematic review of research. *Educational Review*, *75*(4), 787–804. https://doi.org/10.1080/00131911.2021.1931041

[19]   Ringbom, H. (2007). *Cross-linguistic similarity in foreign language learning*. Multilingual Matters.

[20]   Ringbom, H. (2012). Review of recent applied linguistics research in Finland and Sweden, with specific reference to foreign language learning and teaching. *Language Teaching*, *45*(4), 490–514. https://doi.org/10.1017/S0261444812000225

[21]   Ringvald, V., Porath, B., Peleg, Y., Shorr, E., & Hascal, S. (2015). *Brandeis Modern Hebrew*. Brandeis University Press.

[22]   Ryding, K. C. (2005). *A reference grammar of Modern Standard Arabic*. Cambridge University Press.

[23]   Sáenz-Badillos, A. (1996). *A history of the Hebrew language*. Cambridge University Press.

[24]   Segal, O., Hejli-Assi, S., & Kishon-Rabin, L. (2016). The effect of listening experience on the discrimination of /ba/ and /pa/ in Hebrew-learning and Arabic-learning infants. *Infant Behavior and Development*, *42*, 86–99. https://doi.org/10.1016/j.infbeh.2015.10.002

[25]   Shandler, J. (2020). *Yiddish: Biography of a language*. Oxford University Press.

[26]   Treiman, R., Levin, I., & Kessler, B. (2007). Learning of letter names follows similar principles across languages: Evidence from Hebrew. *Journal of Experimental Child Psychology*, *96*(2), 87–106. https://doi.org/10.1016/j.jecp.2006.08.002

[27]   Uni, K. (2015). Utilising Arabic-origin loanwords in teaching Malay as a foreign language. *Pertanika Journal of Social Sciences and Humanities*, *23*(3), 665–680. Retrieved May 20, 2023, from http://www.pertanika.upm.edu.my/resources/files/Pertanika%20PAPERS/JSSH%20Vol.%2023%20(3)%20Sep.%202015/08%20JSSH%201102-2014.pdf

[28]   Uni, K. (2018). Advantages of Hebrew vocabulary of European origin for learning Modern Hebrew. *Journal of Social Sciences Research*, *4*(12), 621–624. https://doi.org/10.32861/jssr.412.621.624

[29]   Uni, K. (2022). Benefits of Arabic vocabulary for teaching Malay to Persian-speaking university students. *Eurasian Journal of Applied Linguistics*, *8*(1), 133–142. Retrieved May 20, 2023, from https://ejal.info/benefits-of-arabic-vocabulary-for-teaching-malay-to-persian-speaking-university-students/

[30]   Walters, S. (2019). Learning to read Hebrew in a Jewish community school: Learners' experiences and perceptions. *The Language Learning Journal*, *47*(2), 257–267. https://doi.org/10.1080/09571736.2017.1283350

Kazuhito Uni was born in Hyogo, Japan, in 1983. In 2010, he obtained his master's degree in human and environmental studies at Kyoto University, Kyoto, Japan. In 2018, he received a Ph.D. in Linguistics from the University of Malaya, Kuala Lumpur, Malaysia.

In 2015, he was invited to make an academic presentation at the National Institute of Education, Singapore, and he has published research papers in SCOPUS-cited journals, including Connecting Kanji radicals with their Malay equivalents in Japanese Kanji instruction to native Malay-speaking students. *GEMA Online Journal of Language Studies*, *19*(4), 128–147. His research interests include teaching Japanese, English, French, German, Swedish, and Malay as foreign languages.

Dr. Uni obtained the Journal Publication Award in 2019 from the Islamic Science University of Malaysia. In addition, he received the best paper award at the Sixth World Conference on Integration of Knowledge 2020 on August 27, 2020, and at the Ninth International Conference on Social Science Research on November 30, 2020.