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Relationship between Vocabulary Learning Strategies and Vocabulary Size: Evidence from Saudi Female EFL Learners

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ABSTRACT

Vocabulary knowledge has been largely viewed as an important component in language learning and language acquisition. Understanding how EFL learners approach vocabulary learning is also considered crucial for language teachers and researchers to develop an effective learning environment that may stimulate high-quality learning outcomes. Studies on vocabulary size suggest that Saudi EFL learners have impoverished vocabulary knowledge, but there is still little known about how likely certain vocabulary learning strategies may enhance vocabulary knowledge. This study aims to address this issue. We specifically aim to identify the type of vocabulary learning strategies more frequently used among Saudi female EFL learners, and how the use of certain learning strategies may influence vocabulary knowledge. We asked participants to complete two test instruments: the Vocabulary Learning Strategies Questionnaire and the Vocabulary Size Test. All data was gathered using an online survey and the results showed evidence that participants largely rely on metacognitive learning strategies to learn English vocabulary, and all participants seem to have no problems with high- and mid-frequency words. Our relationship tests also suggest that the increase in using the metacognitive strategy is likely to enhance vocabulary knowledge among our participants. These results together are thought to provide useful insights to language learning theories in general and to Saudi teachers and policymakers in particular about how they can help students overcome challenges associated with their vocabulary learning strategies and vocabulary size.

Key words: EFL learners, vocabulary learning strategies, vocabulary size, learning styles, Saudi Arabia

INTRODUCTION

Mastering vocabulary is a difficult task in language learning, whether it is in the EFL context or ESL environment. Inadequacy in vocabulary knowledge is also thought to result in various challenges among which poor reading comprehension and the inability to establish a natural conversation (Alzahrani et al., 2021; Fan, 2003). Recent research on vocabulary acquisition has placed an increasing emphasis on the way with which students learn new vocabulary, specifically how a particular group of learners uses certain strategies to acquire new vocabulary in the target language. These empirical attempts aim to assist teachers to make informed decisions about how they should use more proper and effective teaching methods that could help students maximize their vocabulary resources and be self-dependent learners (Al-Omairi, 2020; Rabadi, 2016).

According to Chamot and Kupper (1989), VLSs refer to particular techniques and methods that learners employ to help them "comprehend, store, and remember information" about the learnt vocabulary. There has been a prolific strand of scholars who tried to identify how learners use vocabulary learning strategies in their L2 (Carston, 2002; Cook & Mayer, 1983; Gu & Johnson, 1996; Nation, 2001; Oxford, 1990; Schmitt, 1997, 2000; Stoffer, 1995). They introduced taxonomies that defined how some students may approach vocabulary learning. For example, Cook & Mayer (1983) found that vocabulary learning strategies are categorized into two main groups: discovery strategies and consolidation strategies. The former group is thought to place focus on how L2 learners discover the meaning of the word, whereas the latter group places attention on how this meaning is memorized and retained.

Capitalizing on Cook and Mayer (1983), Nation (2001) has later introduced a new taxonomy of vocabulary learning strategies that fall into four main categories: planning, sources, processes, and skill in use. While the *planning* strategies focus on how learners should choose their words, what aspects to focus on, or what strategies they recruit to remember the word over time, the *sources* strategies focus on how learners seek extra information about the word to memorize it, whether it is through the structure of the word or through guessing the meaning from context,

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dictionaries, or cognates coming from other languages (L1 or L2). The *processes* strategies also involve strategies that pertain to learners' ability of word retrieval, as well as its use in a natural context, *whereas* the *skill in use* strategies focus on learners' ability to make use of the learnt words in listening, reading, writing, and speaking outside their classroom to develop their English competency in these four skills.

Despite the extensive efforts given to establish a clear taxonomy of vocabulary learning strategies, Schmitt (1997, 2000) argues that these aforementioned taxonomies are not exclusive, and thus fail to provide a clear picture of the various strategies that could be employed by learners. As such, Schmitt (1997, 2000) relied on Oxford's (1990) classification system of language learning strategies to model his new taxonomy. Oxford's (1990) classification system of language learning strategies comprise six categories: memory strategies, cognitive strategies, compensation strategies, metacognitive strategies, affective strategies, and social strategies. Schmitt adopted four of Oxford's strategies; namely, the social strategies, memory strategies, cognitive strategies and metacognitive strategies, and then added a new strategy called the determination strategy, which he found unsatisfactorily lacking in Oxford's scheme.

Several studies have used these vocabulary learning taxonomies in the last two decades and the topic of vocabulary has become one of the most researched topics in the literature (Al-Khasawneh, 2019; Al-Nujaidi, 2003; Alzahrani et al., 2021). These studies converge on the proposition that vocabulary learning is problematic to EFL learners EFL learners have a very limited resource of vocabulary and their impoverished vocabulary knowledge is thought to be the bottleneck of their struggles in reading comprehension and the general use of language (Al-shujairi et al., 2019; Alahmad, 2020; Milton & Treffers-Daller, 2013). While some have attributed this lack of lexical knowledge to classroom teaching approaches and lack of proper teaching material, others have linked it to students' unawareness of the various VLSs they can employ to learn new English words (Al-Harbi & Ibrahim, 2018; Al-Omairi, 2020; Alahmadi et al., 2018; Alqarni, 2017; Hamdany, 2018; Maghsoudi & Golshan, 2017; Rabadi, 2016).

Although several studies have investigated VLSs among school and university EFL students, there is little attention paid to how VLSs contribute to students' vocabulary knowledge (Alahmad, 2020; Alahmadi et al., 2018; Waldvogel, 2013). Critically, previous studies on vocabulary acquisition were largely one-dimensional in their approach of vocabulary investigation placing their emphasis either on the types of VLSs (Alqarni, 2017; Alshammari, 2020) or on students' vocabulary size (Altalhab, 2019), but little is known about the relationship between VLSs and vocabulary size. According to recent work, the use of different VLSs is likely to increase students' vocabulary size (Alahmad, 2020; Maghsoudi & Golshan, 2017). For instance, Alqarni (2017) attempted to examine the types of vocabulary learning strategies that are frequently employed by Saudi university students. Alqarni recruited 81 Saudi male students from the English Department at King Saud University. All of them responded to a VLS questionnaire that assessed the use of five VLSs: determination strategies, memory strategies, social strategies, cognitive strategies, and metacognitive strategies. The participants' responses revealed that the metacognitive strategy is more frequently used than the social strategy, determination strategy, cognitive strategy, or memory strategy. Further analyses of the data showed that participants were overall poor users of vocabulary learning strategies. Similar findings have been reported by several studies in the literature (Al-Harbi & Ibrahim, 2018; Alahmadi et al., 2018; Hamdany, 2018; Rabadi, 2016), and thus evidence showing that different participants with different characteristics tend to use different vocabulary learning strategies.

It merits noting that most of these aforementioned studies have almost exclusively focused on VLSs and how they are used by a specific group of EFL learners, and therefore; the relationship between vocabulary learning strategy and vocabulary size remains underexplored, specifically how high strategy use may enhance vocabulary knowledge among EFL learners (Alahmad, 2020). Our study aims to address this issue and the present study aims to investigate the following questions:

1. What are the most and least frequent vocabulary learning strategies used by Saudi female EFL learners?
2. What is the level of vocabulary size among Saudi female EFL learners?
3. What is the relationship between strategy use and vocabulary size among Saudi female EFL learners?

METHODOLOGY

Participants

The participants were 116 Saudi EFL learners from Saudi Arabia. All were female undergraduates studying English language and linguistics. Participants' ages ranged between 18 and 45 (M= 23.31, SD= 4.45), and for proficiency, the participants' self-reports showed that almost all took the STEP and IELTS tests. Some participants took other proficiency tests, while some others did not report their scores. Those who reported their STEP and IELTS scores made 59% of the sample size. As for the STEP test, the scores ranged between 52 and 96 (M= 78.1, SD= 10.74) and they, therefore, seemed to have a high level of proficiency. While for the IELTS test, those with Band 5.5 and Band 6 were the majority (i.e., six participants), followed by those with band 6.5 and band 7 (4 participants), and finally those with band 7.5 and 8.5 (2 participants), and thus these scores arguably indicate an acceptable proficiency level relative to participants' field of study, i.e., English and Linguistics.

Instruments

The study used two instruments for data collection: The Vocabulary Learning Strategies Questionnaire (the VLSQ, Schmitt (1997)) to identify the types of VLSs used by participants, and the Vocabulary Size Test (the VST, Beglar and Nation (2013)) to provide a measure of their vocabulary size. A brief description of each instrument is given below.

Vocabulary learning strategies questionnaire

The present study adopted the VLSQ developed by Schmitt (1997, 2000). This questionnaire is used to identify the most and least frequent VLSs used by EFL learners. This instrument is designed and suitable for students of any educational background and target language. It comprises 40 items that are cover five key learning strategies: memory, determination, social, cognitive, and metacognitive. A description of each strategy is given below.

a. Memory strategy (MEM): it refers to the use of mental techniques and previous knowledge used to retain words in the long-term memory.
b. Determination strategy (DET): it indicates that learners use their own resources to find out the meaning of new words, whether by guessing it from context or by using dictionaries.
c. Social strategy (SOC): this strategy is used inside the classroom and vocabulary learning is quite dependent on instructors.
d. Cognitive strategy (COG): it refers to the act of taking notes of new words, verbal and written repetitions, and saying lexical items out aloud.
e. Metacognitive strategy (MET): it entails the use of a plan or self-evaluation of the learning process.

This questionnaire has a five-point scale option, where 1 indicates the option Never, 2 the option Seldom, 3 the option Sometimes, 4 the option Often, and 5 the option Always. This instrument has been previously used in a similar context among Arab EFL learners (Alqarni, 2017; Rabadi, 2016).

Vocabulary size test

This test is originally designed to measure learners' written receptive vocabulary size in English language with the aim to estimate if the learner has enough vocabulary to efficiently perform a task (Beglar & Nation, 2013). It examines the extent to which participants know English vocabulary compared to their peers at the same educational level. This test covers 14 word-families ranging from high-frequency words to low-frequency words. According to Beglar and Nation (2007), the words that list between 1000 and 2000 word-frequency are classified as high-frequency words, while those between 3000 to 9000 are mid-frequency words, and 10000 words and above are low-frequency words. Each word frequency family comprises 10 questions that test the knowledge of 10 words. Participants are usually required to read each word in the test and circle the closest meaning to the keyword in the question. An example from the 1000-word frequency level about the word "pub" is given below.

PUB: They went to the pub.
A place where people drink and talk
B place that looks after money
C large building with many shops
D building for swimming

Similar to previous studies in the same context (Al-Nujaidi, 2003; Alahmadi et al., 2018), this study tested two main levels of frequency: high-frequency words and mid-frequency words, specifically those families between 1000-word family and 5000-word family. This makes up 50 questions altogether. This selection was based on several reasons. First, it was to save time, as the full form of the test takes about 40 minutes on average to complete. Second, there are several studies on vocabulary size which converge on the proposition that Saudi EFL students are less likely to have an extensive vocabulary knowledge that would reach 5000-word frequency or above (Al-Khasawneh, 2019; Al-Nujaidi, 2003). Third, Nation (2012) suggests "that non-native speakers of non-European backgrounds have a vocabulary size of around 5,000-6,000-word families". These justifications together suggest that shortening the full test to 5000-words frequency is supported and reliable.

Data Collection Procedures

We distributed the VLSQ and VST via Google Forms using a survey link. The survey started with information that explained the purpose of the study and how the questionnaires should be filled out. The participants were informed that all responses are used for research purposes and hence will be treated anonymously.

This research was also reviewed and approved by the Central Research Ethics Advisory Group at University of Kent to avoid any harm related to vicious conduct, confidentiality, and voluntariness.

DATA ANALYSIS

Data treatment and Exclusion Criteria

Prior to data analysis, all data points gathered from 116 respondents were explored. A total of 16 cases were removed leaving the sample size at 90. The removed cases were 5 male participants, 6 non-Saudis, and 5 respondents who adopted a single-type response throughout the survey. The raw data was then computed and the participants whose mean score was above 3 *SD* were removed from any subsequent analyses although this procedure did not result in removing any participant. The results of the Skewness and Kurtosis analyses showed that all data points were distributed between -1 and +1, and therefore; they were normally distributed (Tabachnick, Fidell, & Ullman, 2007).

Vocabulary Learning Strategies among Saudi EFL Learners

One of the principal objectives of the present study is to examine the most and least frequent VLSs used by Saudi EFL students. Five types of VLSs were investigated: the cognitive, metacognitive, social, memory, and determination strategy. To measure the frequency with which the participants used these strategies in vocabulary learning, we conducted a descriptive statistical analysis using IBM SPSS (Version 26). A summary of the mean and standard deviation is presented in Table 1 and graphically displayed in Figure 1 below.

The results of the descriptive analysis showed that participants tend to rely more on metacognitive strategies to learn new English words (*M*= 3.47, *SD*= 0.656) than

Table 1. Vocabulary learning strategies among Saudi female EFL learners

Reference	Mean	SD	Level
Metacognitive strategies	3.47	0.656	Medium
Determination strategies	3.23	0.654	Medium
Memory strategies	3.02	0.677	Medium
Social strategies	2.93	0.609	Medium
Cognitive strategies	2.67	0.753	Medium

The mean scores that range between 1.00 and 2.33 are considered "low", between 2.34 to 3.67 are "medium", and those between 3.68 and 5.00 are "high"

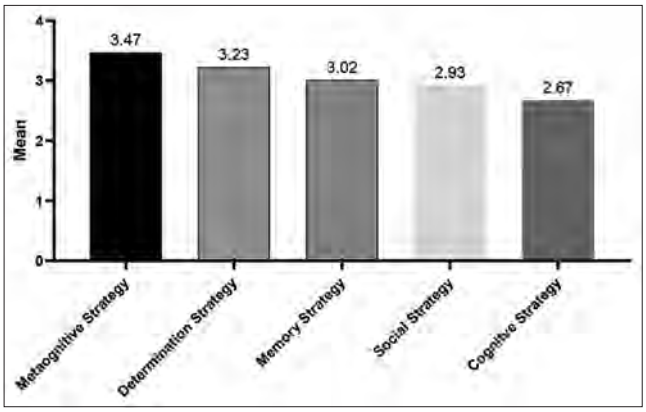

Figure 1. Use of Vocabulary Learning Strategies among Saudi EFL Learners

determination strategies (*M*= 3.23, *SD*= 0.654), memory strategies (*M*= 3.02, *SD*= 0.677), social strategies (*M*= 2.93, *SD*=.609), or cognitive strategies (*M*= 2.67, *SD*= 0.753). Subsequent to this, in order to understand the specific VLSs that were more dominantly used under each main strategy, we did an-item based analysis for each vocabulary learning strategy. The results obtained from these analyses are presented in the following subsections.

Metacognitive strategy

This learning strategy entails learners' control and self-evaluation of the learning process (Schmitt, 1997, 2000). In analysing the students' responses to the metacognitive strategy, we find that these sub-metacognitive strategies are used with varied frequencies. Table 2 below show the results. The strategies that are more frequently used by the participants were presented first, from the high-frequency sub-strategies to low-frequency sub-strategies.

Table 2 above shows a breakdown of the items related to the metacognitive strategy. As seen in the table, Saudi EFL students are more likely to learn new vocabulary through non-conventional learning strategies. For instance, learning new words from films and television programs is the most frequent metacognitive strategy (*M*= 4.19, *SD*= 1.037), followed by listening activities in the foreign language (*M*= 3.88, *SD*= 1.131), picking up words from advertisements or written notices (*M*= 3.70, *SD*= 1.240), and reading articles from several resources (*M*= 3.56, *SD*= 1.181).

Table 2. Metacognitive learning strategies among Saudi female EFL students

		Mean	SD	Level
1	I learn new words by watching English-speaking movies with subtitles.	4.19	1.037	High
2	I expand the knowledge of lexical items by listening to English songs.	3.88	1.131	High
3	I study new vocabulary items from advertisements, written signs, written notices, etc.	3.70	1.240	High
4	I learn new lexical items by reading articles from several sources as magazines, newspapers, brochures, etc.	3.56	1.181	Moderate
5	I learn new words by relating newly learned words with previously learned ones.	3.44	1.029	Moderate
6	I learn new words by listening to English radio programmes.	3.12	1.261	Moderate
7	I expand the knowledge of lexical items by doing extra-curriculum exercises from different sources, such as articles, texts, internet, etc.	2.99	1.194	Moderate
8	I expand the knowledge of vocabulary items by testing your vocabulary knowledge with word lists.	2.88	1.110	Moderate

The mean scores that range between 1.00 and 2.33 are considered "low", between 2.34 to 3.67 are "medium", and those between 3.68 and 5.00 are "high"

However, the participants seem to be less reliant on making word lists (*M*= 2.88, *SD*= 1.110) or doing extra-curriculum exercises (*M*= 2.99, *SD*= 1.194), and thus these two strategies are considered the least frequent metacognitive strategies among Saudi female EFL learners.

Determination strategy

As regards the determination strategy, which commonly refers to the use of dictionaries and mother language translations, it is the second most frequently used strategy among our participants. This study further analysed the use of this strategy to examine the specific determination strategies that Saudi students usually use in their vocabulary learning. The participants' use of this determination strategy was analysed using descriptive statistics and the results are presented in Table 3 below.

Table 3 shows that guessing the meaning of new words from context is the most frequent determination strategy among Saudi EFL students (*M*= 4.07, *SD*= 1.025). Since

the participants are English majors, they depend more on using English-English dictionaries (*M*= 3.62, *SD*= 1.214) than English-Arabic dictionaries (*M*= 3.52, *SD*= 1.238). However, the students seem to be less dependent on guessing the meaning from word classes (*M*= 3.51, *SD*= 1.114), or using Arabic-English dictionaries (*M*= 3.08, *SD*= 1.368) to learn new English words. Guessing the meaning of the new English word from its aural features appears to be the least frequent determination strategy (*M*= 2.40, *SD*= 1.216).

Memory strategy

The memory strategy refers to learners' use of previous knowledge and experience to remember words (Nation, 2013). This study examined how Saudi EFL learners learn new English words using memory strategies. This strategy covers 8 types of memory strategies. The participants' use of this strategy was analysed using descriptive statistics and the results are presented in Table 4 below.

Table 3. Determination strategies among Saudi female EFL students

		Mean	SD	Level
1	I guess the meaning from context to discover the meaning of new words.	4.07	1.025	High
2	I use an English–English dictionary to find the meaning of new words.	3.62	1.214	Moderate
3	I use an English–Arabic dictionary to discover the meaning of new words.	3.52	1.238	Moderate
4	I guess the meaning from word classes, such as noun, verb, adjective, adverb, to discover the meaning of new words.	3.51	1.114	Moderate
5	I use an Arabic–English dictionary to discover the meaning of new words.	3.08	1.368	Moderate
6	I guess the meaning from grammatical structure of a sentence to discover the meaning of new words.	2.89	1.126	Moderate
7	I guess the meaning by analysing the structure of words (prefixes, roots, and suffixes) to discover the meaning of new words.	2.73	1.330	Moderate
8	I guess the meaning from aural features, such as stress, intonation, pronunciation, to discover the meaning of new words.	2.40	1.216	Moderate

The mean scores that range between 1.00 and 2.33 are considered "low", between 2.34 to 3.67 are "medium", and those between 3.68 and 5.00 are "high"

As illustrated in Table 4 above, identifying the part of speech of new English words is considered one of the most favourite memory learning strategies to Saudi EFL learners (*M*= 3.71, *SD*= 1.134). At medium frequency, the participants tend to memorize new English vocabulary by building up new sentences (*M*= 3.37, *SD*= 0.914). They also seem to depend on "pre-existing information in the long-term memory to associate them with new information" (Schmitt, 2000). This was demonstrated in their use of strategies in which they connect new words to physical images (*M*= 3.32, *SD*= 1.256) and they group words together to remember them (*M*= 3.17, *SD*= 1.229). However, the participants seem to be less reliant on using semantic maps to learn new words (*M*= 1.80, *SD*= 0.962), or categorizing words according to their synonyms or antonyms (*M*= 2.86, *SD*= 0.910).

Social strategy

This strategy refers to the act of interacting with peers and asking teachers to find the meaning of new English vocabulary (Oxford, 1990). Our study aimed to identify the specific social sub-strategies that are frequently used by Saudi EFL learners. In analysing the students' responses, the results suggest that these social strategies are used with varied frequencies. Table 5 below presents the frequency of these social learning strategies among our participants.

According to the results in Table 5, the strategy of consulting the Internet to learn new English vocabulary is construed the most frequent social learning strategy among Saudi female

Table 4. Memory strategies among Saudi female EFL students

		Mean	SD	Level
1	I observe the parts of speech of the new vocabulary items.	3.71	1.134	High
2	I use new vocabulary items in sentences repeatedly.	3.37	0.941	Moderate
3	I connect pictures to the meanings of new words.	3.32	1.256	Moderate
4	I group new words together to learn new vocabulary.	3.17	1.229	Moderate
5	I examine the new words' affixes (prefixes and suffixes).	3.03	1.353	Moderate
6	I group new words in relation to similar pronunciation and spelling.	2.87	1.274	Moderate
7	I categorize new words according to their synonyms and antonyms.	2.86	0.910	Moderate
8	I use semantic maps to learn new words.	1.80	0.962	Low

The mean scores that range between 1.00 and 2.33 are considered "low", between 2.34 to 3.67 are "medium", and those between 3.68 and 5.00 are "high"

EFL learners (*M*= 3.97, *SD*= 0.988). Other means of learning include the use of media and speaking English with foreigners (*M*= 3.22, *SD*= 1.313), in addition to communicating in English with classroom instructors (*M*= 2.98, *SD*= 1.341). However, asking the instructors to translate English words into Arabic seems to be the least frequent social learning strategy (*M*= 2.46, *SD*= 1.172). The low use of this sub-strategy could be due to their English program, viz, the medium of instruction is English and using Arabic is not favoured in their English department.

Cognitive strategy

This strategy refers to the act of taking notes of new words for future reference (Nation, 2013). The study further examined the most and least frequent cognitive strategies that participants depend on in learning new English words. Participants' responses to these items were analysed using descriptive statistics and are presented in Table 6 below.

Table 6 provides a summary of the most and least practices of the cognitive strategy used in vocabulary learning among Saudi female EFL students. The results suggest that Saudi EFL students are more reliant on taking notes of new English words during class time (*M*= 3.40, *SD*= 1.197) and reading aloud the words with their meanings (*M*= 3.23, *SD*= 1.237). Subsequent to this, the participants believe they can remember words better if they associate them with physical objects (*M*= 2.89, *SD*= 1.156) and write the new lexical term repeatedly (*M*= 2.77, *SD*= 1.133). However, the participants do not seem to favour using flashcards to learn new English words (*M*= 1.74, *SD*= 1.034), or listening to vocabulary CDs (*M*= 1.78, *SD*= 1.110). These last two strategies may apply to children or students with basic English, and thus this could be a tentative interpretation of why our participants rely little on these two specific cognitive strategies.

Table 5. Social strategies among Saudi female EFL students

		Mean	SD	Level
1	I look for extra English information through the Internet to learn new vocabulary items.	3.97	0.988	High
2	I communicate with foreigners in English through different types of media to develop new vocabulary.	3.22	1.313	Medium
3	I communicate with instructors of English in English to use a new lexical item in a sentence to increase the knowledge of vocabulary.	2.98	1.341	Medium
4	I communicate with instructors of English in English to ask for a synonym of a new word or to explain it.	2.91	1.321	Medium
5	I discuss in English with classmates to know and expand the meaning of a new vocabulary item.	2.79	1.194	Medium
6	I play English games, such as scrabble, crossword puzzles to find meaning of a new vocabulary item through group work activities.	2.61	1.313	Medium
7	I study and practice meaning of new vocabulary items in-group to expand lexical knowledge.	2.49	1.134	Medium
8	I ask instructors of English for Arabic translation of new lexical items.	2.46	1.172	Medium

The mean scores that range between 1.00 and 2.33 are considered "low", between 2.34 to 3.67 are "medium", and those between 3.68 and 5.00 are "high"

Vocabulary Size among Saudi EFL Learners

The participants' vocabulary size was measured using the VST. This test comprised 50 test items, and therefore; the minimum achievement score is 0 and the maximum score is 50. All participant's responses were analysed using descriptive statistics. According to our results, the minimum score of the participants is 15 and the maximum score is 49, while the mean score is *M*=38.71, *SD*=.7.33 To further

Table 6. Cognitive strategies among Saudi female EFL students

		Mean	SD	Level
1	I revise previous English lessons and take notes in class to learn the new vocabulary items.	3.40	1.197	Moderate
2	I repeat orally a single word with its meanings to learn it.	3.23	1.237	Moderate
3	I practice orally new words with their lexical sets.	2.93	1.168	Moderate
4	I associate new vocabulary items with physical objects to learn the lexical items.	2.89	1.156	Moderate
5	I use a new lexical item by writing it repeatedly in sentences.	2.77	1.133	Moderate
6	I keep a notebook for a vocabulary list with meanings and examples to learn the new vocabulary items.	2.64	1.463	Moderate
7	I listen to vocabulary CDs to learn new vocabulary items.	1.78	1.110	Low
8	I write new lexical items with meanings on flash cards to learn them.	1.74	1.034	Low

The mean scores that range between 1.00 and 2.33 are considered "low", between 2.34 to 3.67 are "medium", and those between 3.68 and 5.00 are "high"

explore how the participants performed on the vocabulary test, the achievement scores were categorized into 5 different groups: those scores ranging between 0-10 were considered the bottom scores ("Very low"), 11-20 ("Low"), 21-30 ("Moderate"), 31-40 ("High"), and 41-50 ("Very high"). The percentage of participants in these five categories are presented in Figure 2 below.

Figure 2 shows that most of the participants have a "very high" vocabulary size (55.6%) and "high" vocabulary size (30%). Only a small number of the participants have a "moderate" (12.2%) and low (2.2%) level of vocabulary size. None of the participants has a "very low" vocabulary size. These results show that most of the participants of the present study seem to have good lexical knowledge, which is reasonably not surprising as all the respondents' field of study was English language.

Relationship Between Vocabulary Learning Strategies and Vocabulary Size

This study investigated the relationship between participants' VLSs and vocabulary size using a regression analysis. The metacognitive strategy, cognitive strategy, social strategy, memory strategy, and determination strategy were the independent variables of the study, whereas participants' score of the vocabulary size test was the dependent variable. All the variables were entered in a single model using the forced entry method and the bootstrap robust procedure in IBM SPSS. The results obtained from this regression analysis are given in Table 7 below.

Table 7 shows a summary of the results obtained from the multiple linear regression analysis. According to the results, the model was significant (F (5, 89) = 2.57, p <.05), and the VLSs can account for 13% of the variance in the dependent variable, that is, vocabulary size. It is obvious that there are two variables that significantly predicted participants' vocabulary size score; namely, the metacognitive strategy being a significant and positive predictor (t(89) = 2.49, p <.05), and the cognitive strategy being a significant and negative predictor of the dependent variable (t(89) = -2.30, p <.05). The social strategy, memory strategy, and determination strategy did not show any significant relationship with participants' vocabulary size (all p >.05).

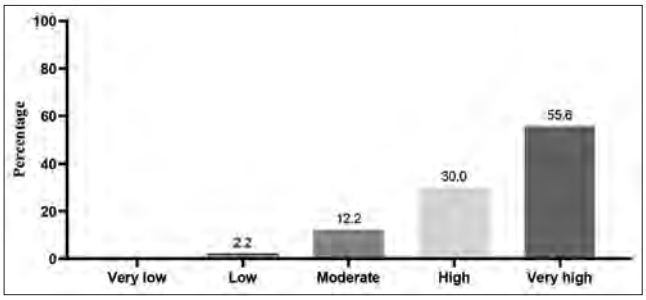

Figure 2. Level of vocabulary size

Table 7. Results of bootstrap multiple regression analysis between vocabulary learning strategies and vocabulary size

Predictor	*B*	*SE*[a]	*β*	*Sig*[b]
(Constant)	36.763	4.075		0.001
Metacognitive	0.174	0.076	0.312	0.021
Cognitive	-0.130	0.058	-0.268	0.032
Social	-0.111	0.101	-0.184	0.277
Memory	0.031	0.076	0.057	0.680
Determination	0.023	0.068	0.040	0.734

R^2=0.13; F-test=2.570 (p<0.05)
[a] Standard errors bootstrapped (BCa)
[b] Significance tests bootstrapped (BCa)

DISCUSSION

This study has recruited Saudi female EFL learners to participate in a task through which they report the practices they use to acquire new English words, specifically the cognitive, metacognitive, memory, social, and determination strategies. All participants also took a vocabulary size test. Our results showed that the metacognitive strategy was the most dominant vocabulary learning strategy among Saudi EFL learners, whereas the cognitive strategy was the least frequent. These results suggest that participants with linguistic background largely depend on non-conventional methods in learning new English words, such as picking up words from films and TV programs. Prima facie, this view is consistent with other previous studies on Saudi female undergraduates (Alahmad, 2020; Alahmadi et al., 2018; Alqarni, 2017). For instance, Alqarni found that using English-language media (i.e., movies, songs, podcasts) in vocabulary learning is the most frequent metacognitive strategy among female Saudis. Similar findings were also reported by Al-Harbi and Ibrahim (2018), but our results are still not in tandem with other studies in the same context (Rabadi, 2016). A possible explanation of this discrepancy could be linked to the level of education and level of language proficiency that often affects learning style (O'Malley et al., 1985; Oxford, 1990; Waldvogel, 2013). Our participants were linguistic students and their English proficiency was arguably high. Waldvogel (2013) suggests that metacognitive learning strategies are very sophisticated and they require higher levels of language proficiency for their recruitment. School students or those with low language proficiency skills are usually less likely to depend on metacognitive strategies (Alahmad, 2020; Milton & Al-Masrai, 2012) and they therefore tend to rely on cognitive and social strategies whose usage makes learning partly involving instructors and classmates (Rabadi, 2016). That said, this suggests that our English undergraduate participants seem to be more independent learners and they are more likely to depend on themselves than instructors in vocabulary acquisition. The little use of the cognitive strategy in our data can support this claim. Our participants no longer needed to use flashcards or keep a notebook of new English words, and thus an indication of departing the rote learning methods that are very common in high schools (Alqarni, 2017). The dependence on the metacognitive strategy may facilitate vocabulary acquisition outside the classroom (Pigada & Schmitt, 2006; Schmitt, 2010), and thus a possible

reason why it was frequently used by our participants who finished their school stage and became more self-dependent at university.

Our study has further estimated participants' vocabulary size. Recent research suggests that EFL learners "need about 2,000-3,000 of the most frequent English words to participate effectively in everyday conversation, whereas 5,000 words to begin to read authentic texts, and around 10,000 for starting an academic degree course" (Milton & Treffers-Daller, 2013). The results of the present study showed evidence that our participants were competent with the 1000-5000-word frequency test. More than 85% of the participants achieved "high" and "very high" scores in the test. This suggests that our English undergraduate participants met the minimum threshold of vocabulary knowledge required in reading comprehension, reading academic materials, authentic texts, and performing well in basic communications and spoken discourse (Alahmadi et al., 2018; Hirsh & Nation, 1992; Laufer, 1997; Milton & Al-Masrai, 2012). However, our findings seem to oppose a large majority of previous work on vocabulary size in the Saudi context (Al-Khasawneh, 2019; Alahmad, 2020; Alzahrani et al., 2021). The participants in these studies exhibited inferior levels of vocabulary size. Their vocabulary size tended to be low in medium-frequency word tests. In our study, this was not the case. The participants showed superior abilities in high- and medium-frequency words. Nevertheless, this may not be surprising as the participants of our study were all linguistic students and they are reasonably expected to have better lexical knowledge relative to EFL learners whose English is not considered their major of study or the medium of their instruction. This being so, one may propose that our participants are considered proficient in the high- and medium-frequency words but it is still clear how our participants would perform on low-frequency word tests, and thus this remains an open avenue for future investigation.

Similar to recent work that addressed the relationship between vocabulary learning strategies and vocabulary size (Aljdee, 2011; Alqarni, 2017; Memis, 2018; Zhang & Lu, 2015), our study assessed the relationship between participants' use of five vocabulary learning strategies and the total score of their vocabulary size test using a regression analysis. This was to identify the specific vocabulary learning strategy that contributes more to participants' vocabulary knowledge. Our results showed a significant relationship between strategy use and vocabulary size. Both the metacognitive strategy and cognitive strategy exhibited a significant relationship with participants' vocabulary size. While the metacognitive strategy was a positive predictor, the cognitive strategy was a negative predictor of vocabulary size. These results corroborate recent reports on the relationship between strategy use and vocabulary knowledge (Alahmad, 2020; Alahmadi et al., 2018). For instance, Alahmadi et al. (2018) investigated the impact of different vocabulary learning strategies on vocabulary size among undergraduate Saudi EFL learners and found that the strategy of guessing the meaning from context had the highest correlation with participants' vocabulary size. Their clustering analyses also revealed that those who used more vocabulary learning strategies tended to have a larger vocabulary size, irrespective of educational level.

Similar to Alahmad (2020), we observed a significant and positive relationship between participants' metacognitive learning strategies and vocabulary size, but a reverse pattern between participants' cognitive strategy and vocabulary size. We mainly attribute this discrepancy to differences in the use of these vocabulary learning strategies among our participants. According to our data, the metacognitive learning strategy is the most frequently used vocabulary learning strategy among the participants, whereas the cognitive strategy is the least frequent learning strategy. This suggests that an increase in strategy use is likely to result in an increase in vocabulary knowledge, whereas participant's impoverished use of strategies is likely to negatively influence vocabulary learning. This tentative explanation is in tandem with the literature on language learning strategies (Oxford, 1990; Rubin, 1975; Shi, 2017). That said, one can reasonably suggest that strategy use is a significant predictor of vocabulary size, and hence teachers are advised to help EFL learners be familiar with a wide range of vocabulary learning strategies that can be employed to learn new English words inside and outside their classroom (Alahmad, 2020; Alhaysony, 2017; Alqarni, 2017).

CONCLUSION

Our study showed that strategy use is very useful in vocabulary learning among Saudi female EFL learners. Those who were highly users of the metacognitive strategy seemed to hold a larger lexical resource, whereas those who tended to use the cognitive strategy, which is the least used learning strategy among all participants, seemed to have lower levels of vocabulary size. Overall, all participants showed good competency in high- and medium-frequency words, but we still do not know how the same participants would perform on more difficult vocabulary tests, or what we call low-frequency words. Future studies may need to consider this gap and focus on students with different proficiency levels through which results can be more representative of other students and thus be more generalizable.

Our results have implications for students and language educators, inter alia. EFL teachers may need to consider planning more effective teaching materials and activities that make students more familiar with a wide range of learning strategies necessary for vocabulary acquisition. In future research, it would be interesting to explore how teachers approach teaching English vocabulary, and how they assist students to learn, memorize, and use new language words. To accomplish this goal, some qualitative data and classroom observations are needed. Qualitative data can tell us whether respondents' answers to the questionnaire are genuinely reflective of what they learn in the classroom. To this end, EFL teachers need to use activities that meet their students' needs and facilitate vocabulary learning and vocabulary development among EFL learners.

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