PHRASAL PARAPHRASE LEARNING: EXPLORING AN EFFECTIVE STRATEGY TO CONSOLIDATE VOCABULARY KNOWLEDGE

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ABSTRACT

Lexical competence is considered as an important indicator of language proficiency. While learning vocabulary, learners need to remember various aspects of knowledge about the word (e.g., meaning, form and use). Many vocabulary learning strategies have been proposed to help learners consolidate vocabulary knowledge. Among them, grouping words belonging to the same meaning categories is conducive to recall (Schmitt, 1997). On the other hand, learning chunks is also a mnemonic device for increasing vocabulary. Taking into consideration these two important vocabulary memory strategies that help students learn faster and recall better, the current study proposes grouping and learning lexical phrases sharing semantic equivalence but differing in use (i.e., phrasal paraphrases) (e.g., "*is worth reading*", "*is worthy of being read*" and "*is worthwhile reading*"). For this, a corpus-based paraphrasing system, PREFER, was introduced because it provides a sufficient number of paraphrases and corresponding Chinese translations, usage patterns and example sentences. Such information could widen and deepen learners' vocabulary knowledge. A pre-and post-test was conducted on 49 college freshmen to examine their performance in phrasal paraphrase learning. The results showed that with the assistance of the introduced system, students achieved substantial gains regardless of their proficiency level. Furthermore, students' errors on the test sheets were thoroughly analyzed for the purpose of understanding students' learning difficulties while learning paraphrases. Despite its exploratory nature, the current study shed some light on the effects of learning phrasal paraphrases on vocabulary expansion.

Key Words: lexical phrase, phrasal paraphrase, vocabulary knowledge, consolidation strategy

INTRODUCTION

Vocabulary knowledge is "a fundamental component of second language proficiency" (Read, 1997, p. 303). Besides the number of known words, how well words are known matters (Anderson & Freebody, 1981). Once a learner has been introduced to a new word, he needs to make an effort to remember the meaning and other aspects of vocabulary knowledge (Schmitt, 1997) such as form and use of the word (Anderson & Freebody, 1981; Nation, 2001; Schmitt, 2014; Tsai, 2017).

There has been an increasing interest in exploring effective approaches to expand language learners' vocabulary knowledge in terms of size and depth (Grami & Alkazemi, 2016; Le-Thi, Rodgers, & Pellicer-Sánchez, 2017; Liou & Chen, 2018; Milton & Fitzpatrick, 2013; Zhang, 2017). In the meantime, many researchers have attempted to propose varied vocabulary learning strategies (Nation, 2001; Schmitt, 1997; Singleton, 1999; Zhang & Li, 2011). Since the scope of the current study was confined to consolidation strategies, we adopted Schmitt's taxonomy (1997), the most comprehensive and widely used vocabulary learning strategy (Lai, 2016).

According to Schmitt (1997), learning words sharing some type of sense relationship (e.g., synonymy or antonymy) could consolidate vocabulary (Oxford, 1990). In addition, organizing words belonging to the same meaning categories into groups (e.g., animals) aids recall. As part of vocabulary consolidation strategies, both memory strategies help "the integration of new material into existing cognitive units and provide retrieval cues" (Thompson, 1987, p. 211).

On the other hand, learning chunks is another effective memory strategy for vocabulary expansion (Dai & Ding, 2010; Schmitt, 1997). Researchers suggest that the degree of fluency is decided by the large number of sequences stored in our memory (Dai & Ding, 2010; Nation, 2001). By nature, chunks or lexical phrases (Nattinger & DeCarrico, 1992) have to be learned through repeated exposure and memorization (Dai & Ding, 2010). In short, it is the memory system that provides learners with lexical phrases to be retrieved and used (Dai & Ding, 2010; Nattinger & DeCarrico, 1992; Nesselhauf, 2003).

Taking advantage of the above memory strategies, the current study proposes grouping and learning lexical phrases which share semantic equivalence but differ in use (i.e., phrasal paraphrase learning). In fact, grouping and learning phrasal paraphrases (e.g., "*it is worth reading*", "*it is worthy of being read*" and "*it is worthwhile reading*") substantiates

more memory strategies, as categorized in Schmitt's taxonomy of consolidation strategies. They include associating the word with its coordinates, connecting the word to its synonyms, grouping words together to study them, studying the spelling of a word, imaging word form and paraphrasing the word's meaning.

To effectively facilitate these strategies, the current study introduces PREFER (Chen, Huang, Huang, Liou, & Chang, 2012), a corpus-based paraphrasing system. Leveraging machine translation techniques, the system suggests phrasal paraphrases, accompanied by usage patterns and example sentences. This information-rich environment can enable leaners to expand and consolidate their vocabulary knowledge in terms of size, form, meaning and use (Nation, 2001).

LITERATURE REVIEW

Vocabulary Knowledge and Vocabulary Consolidation Strategies

Development of vocabulary knowledge occupies a pivotal position in learning a second or foreign language (Alali & Schmitt, 2012; Atay & Ozbulgan, 2007; Coxhead, 2018; Schmitt, 2000). Mastering a word involves the abilities to recognize its forms, to know its meaning, to know its specific grammatical properties as well as to use the word appropriately (Nation, 2001; Oxford & Scarcella, 1994). Note that the term "use", adopting Schmitt's definition, here means "vocabulary practice rather than interactional communication" (Schmitt, 1997, p. 203).

After gaining initial information about a new word, learners need to familiarize themselves with various kinds of vocabulary knowledge (Schmitt, 1997). Among several existing vocabulary learning strategies, Schmitt's taxonomy is the most comprehensive, is widely-used, and covers a wide range of learning behaviors (Atay & Ozbulgan, 2007; Lai, 2016). We adopted Schmitt's taxonomy because the focus of this study is primarily on several memory strategies, which are included in his consolidation strategies.

First of all, word association research suggests that new words can be linked to known words especially when they share some kind of relationship (e.g., synonymy or hyponymy). In other words, learning words that have strong connective bonds (Aitchison, 2012) helps consolidate vocabulary (Oxford, 1990).

Schmitt also suggests organizing the words in some way improves

recall (Cofer, Bruce, & Reicher, 1966; Craik & Tulving, 1975; Schmitt, 1997). Words belonging to the same meaning categories are recalled together (e.g., memorizing all animal names) (Gairns & Redman, 1986; Schmitt, 1997; Seal, 1991). While few studies are available, earlier studies show that grouping and learning words work for both native-speakers (Bousfield, 1953) and second language learners (Chamot, 1987).

Another important memory strategy is learning chunks or lexical phrases. According to Schmitt (1997), learning chunks or lexical phrases serves as a mnemonic device to increase vocabulary. These "ready-made sequences" (Nation, 2001, p. 56) are "stored and retrieved whole from memory at the time of use" (Wray, 2002, p. 9) rather than being grammatically analyzed (Dai & Ding, 2010; Nattinger & DeCarrico, 1992; Nesselhauf, 2003; Weinert, 2010). Also, language processing relies on familiar and memorized materials (Bolinger, 1979).

Since these memory strategies facilitate faster learning and better recall, the current study takes one step further and proposes phrasal paraphrase learning. Phrasal paraphrases are lexical phrases that share semantic equivalence but differ in use (e.g., "*is worth reading*", "*is worthy of being read*" and "*is worthwhile reading*"). In the current study, the paraphrases could involve single words such as conjunctions (e.g., "*therefore*" and "*thus*") and adverbs (e.g., "*similarly*" and "*likewise*"). Learning phrasal paraphrases particularly substantiates six memory strategies: (a) studying the spelling of a word, (b) imaging the verb form, (c) connecting the word to its synonyms, (d) paraphrasing the word's meaning, (e) associating the word with its coordinates, and (f) grouping words together to study them. Importantly, all of these strategies facilitate vocabulary knowledge in terms of meaning, form and use. In particular, learning paraphrases enables learners to think of possible alternatives (strategies (c) and (d)). Meanwhile, through comparing and contrasting, learners could learn various morphological (strategies (a) and (b)) as well as grammatical (strategies (e) and (f)) features (Channell, 1981; Gairns & Redman, 1986; McCarthy, 1990). Table 1 shows how learning paraphrases substantiates the six consolidation strategies and facilitates vocabulary knowledge.

Table 1

Learning Paraphrases Substantiates the Six Consolidation Strategies and Facilitates Vocabulary Knowledge

	Schmitt's consolidation strategies (1997)		Nation's framework of vocabulary knowledge (2001)
(a)	Study the spelling of a word	Form	What does the word look like?
(b)	Image verb form		How is the word written and spelled?
			What parts are recognizable in this word?
(c)	Connect the word to its synonyms	Meaning	What other words does this make us think of?
(d)	Paraphrase the word's meaning		What other words could we use instead of this one?
			In what patterns does the word occur?
(e)	Associate the word with its coordinates	Use	In what patterns must we use this word?
(f)	Group words together to study them		What words or types of words occur with this one?
			What words of types of words must we use with this one?

From Lexical Phrases to Phrasal Paraphrases

Lexical phrases (Nattinger & DeCarrico, 1992), having 50 or more alternative names (Weinert, 2010), are groups of words that have a grammatical structure but operate as a single unit. There is no shortage of research on the importance of learning lexical phrases in second or foreign language learning. Studies of psycholinguistics suggest that language is processed and often acquired through learning about chunks "rather than learning single words (e.g., Peters, 1983). Lexical phrases often incorporate many function words (articles, prepositions, pronouns, etc.) (Cortes & Csomay, 2015). They disclose the details of "strong clustering tendencies and the patterns which are associated with them" (Moon, 1997). For this reason, it is more efficient and effective to learn prefabricated chunks like "is worthy of" than it is to determine whether a preposition is needed or which preposition goes with "worthy" in making a sequence

which often ends up being unconventional or unidiomatic (Chen, Huang, Huang, Chang, & Liou, 2014; Conklin & Schmitt, 2008; Hoey, 2005; Wood, 2009; Wray, 2002).

Since learning lexical phrases has been demonstrated to be an effective vocabulary learning strategy, we consider grouping and learning lexical phrases that share semantic equivalence but differ in use (i.e., phrasal paraphrase learning) a viable way to bolster vocabulary knowledge. The grouped paraphrases not only provide learners with alternatives but also allow learners to compare and contrast the forms and uses of individual phrases. In practice, it is not uncommon to see lists of semantically equivalent word or phrase clusters in pedagogical materials. However, such information does not appear to be well-organized or exhaustive in either textbooks or dictionaries (Campbell, 1990; Chen, Huang, Chang, & Liou, 2015; Frodesen, 2007). Leaners might find it frustrating and time-consuming to manually collect sufficient paraphrases from various sources.

To address this issue, we introduce the PREFER system, a corpus-based paraphrasing assistant system (Chen et al., 2012), to support phrasal paraphrase learning. Leveraging phrase-based machine translation techniques, the PREFER system groups and ranks English phrases that share the same translations. Besides increasing learners' vocabulary, the suggested paraphrases (e.g., "is worth reading", "is worthy of being read" and "is worthwhile reading") could help raise their awareness of various grammatical forms and enable them to associate the word with its coordinates (Kim, 2016; Pawley & Syder, 1983 check year; Webb, 2007). Importantly, the provided usage information and example sentences illustrate real world language use.

The PREFER system (Chen et al., 2012) was initially developed to assist EFL learners in writing (specifically paraphrasing short paragraphs) (Chen et al., 2015). Despite the fact that students achieved success in the paraphrasing task, they were found to have a significant number of usage errors in terms of form and use. In view of learners' difficulties, the current study introduces the PREFER system to help learners consolidate their vocabulary knowledge.

In this study, we examine whether students benefit from the proposed system in phrasal paraphrase learning in terms of size and depth of vocabulary knowledge. Moreover, it is worthwhile to highlight learners' difficulties and discover possible causes. Thus, the current study addresses three questions:

1. Do learners benefit from the PREFER system in terms of the number of phrasal paraphrases learned?
2. Do learners benefit from the PREFER system in terms of the form, meaning and use of phrasal paraphrases?
3. What usage problems do learners have when learning phrasal paraphrases?

The PREFER System

The PREFER system (Chen et al., 2012) was developed based on the assumption that English phrases are semantically equivalent phrases if they share the same foreign translations (Bannard & Callison-Burch, 2005). Utilizing phrase-based statistical machine translation (SMT), English phrases and Chinese phrases in a bilingual parallel corpus are first aligned in order to extract phrase translation pairs. The corpus used to develop the system is the Hong Kong Parallel Text (LDC2004T08), containing a set of more than 2 million Chinese-English sentence pairs. A total of 19.5 million Chinese-English phrases (bigram to 7 gram) are yielded and stored in a phrase table. The English paraphrases are obtained by pivoting on the Chinese phrases, and vice versa. At the same time, the translation probability among each phrase pair is computed. The probability values were obtained by counting how often the English phrases and Chinese phrases were aligned in the parallel corpus. The higher the values, the more likely the phrases are paraphrases. The generated paraphrases are then ranked and displayed. It is worth noting that the suggested paraphrases would include single words such as conjunctions ("therefore" and "thus") and adverbs ("similarly" and "likewise").

As can be seen in Figure 1, the paraphrases of the query phrase "is worth" such as "be worthy" and "be worthwhile" are suggested. Each paraphrase is shown with its corresponding Chinese translation, usage patterns and example sentences. For instance, the usage patterns of "be worthwhile" include "Pronoun be worthwhile Ving", "Noun be worthwhile." and "Pronoun be worthwhile TO" are suggested. Further clicks on any usage patterns bring out the corresponding lexical usages. The example sentences, limited to 25 words in length, are retrieved from the BNC to exemplify real-world language use. To avoid information overload for each query phrase, PREFER displays 10 paraphrases at most.
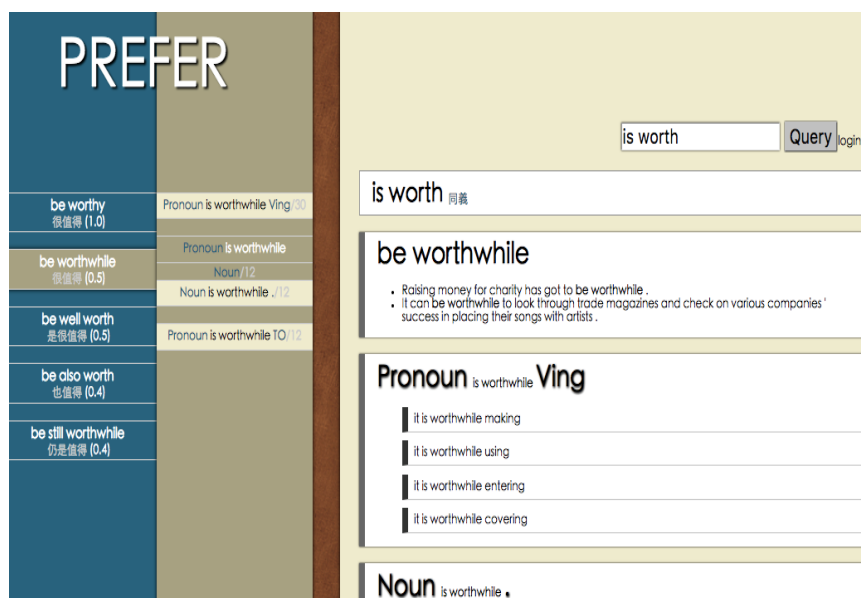
Figure 1. PREFER system interface

METHOD

Participants

Two classes of 62 non-English-major freshmen from a university in Taiwan participated in the study while they were taking a two-credit required Freshman English course. The students had at least six years of formal instruction – from junior through senior high school – and had no experience studying or living abroad. They were estimated to be at the intermediate level based on their performance on a proficiency test (Chen & Lin, 2011), which was conducted at the beginning of the semester. Because 13 students were unable to fully participate in all of the experimental activities, the data of a total of 49 participants were valid for analysis.

The students in two classes were randomly assigned to the experimental and control groups within their classes consulting the PREFER system (n = 27) (hereafter Group P) and traditional tools (n = 22)

(hereafter Group C). To compare the improvements of the students with different proficiency levels, students' pre-test scores were used as an indicator of their proficiency levels. Students who scored above or equal to average (56.47) were classified as high proficiency (n = 25), whereas those with below average scores were low proficiency (n = 24).

Materials

Three materials were employed for collecting quantitative and qualitative data: a test sheet, a worksheet, and interview questions.

To assess whether the students benefitted from PREFER in phrasal paraphrase learning, a multiple-select question task was developed. As it allows respondents to select more than one possible correct item, the multiple-select format was considered the most appropriate for this study. To develop the task, we scrutinized the paraphrases 64 college students produced in a study of Chen et al. (2015). A total of 32 phrases were selected to design the test items. Besides the 22 phrases designed by Chen and her colleagues, ten more phrases where their learners made the most errors were included. The erroneous sequences were particularly annotated and collected to develop distractors. The types of the selected phrases in the pilot and the main studies are shown in Table 2.

Table 2

Sample Types of Phrases Adopted in the Pilot Study and the Main Study

Example phrase	Type	# in pilot study	# in main study
on the whole	Conjunctive adverb	6	4
due to	Preposition phrase	4	4
lead to	Verb phrase	12	5
there is no doubt that	Anticipatory *there*	3	1
it is worth mentioning that	Anticipatory *it*	7	1
		32	15

Each test item contained six alternatives in which two or three erroneous sequences were embedded. For example, the alternatives for "is worth reading" include "*is worthy reading", "*is worthy to read", "is worthy of being read", "is worthwhile to read", "is worthwhile reading",

and "*is worthwhile to reading" (the phrases marked with an asterisk are distractors). In developing the stems, example sentences for individual query phrases were adapted from the *Longman Dictionary of Contemporary English*. Each test sentence was kept lexically and structurally simple (the length of each sentence was no more than 15 words) to reduce cognitive loads. The multi-select task asked the students to determine whether each alternative semantically and syntactically matched the given context by marking "✓" or "✗". Table 3 shows the form of the test item. Dichotomous scoring was used to determine students' performances: the student was awarded one point if he provided correct answers for each alternative; otherwise, he received zero points. As each test item was worth six points, the full marks for the entire test were 90.00.

Table 3

Example Test Item

The book **is worth reading**.
(✗) is worthy reading
(✗) is worthy to read
(✓) is worthy of being read
(✓) is worthwhile to read
(✓) is worthwhile reading
(✗) is worthwhile to reading

✓ indicates the correct answer and ✗ the incorrect answer.

A pilot test was conducted one semester before the main study, aiming at assessing the validity and reliability of the self-developed multi-select test and the questionnaire. The background of the participants and the duration of the experiment were the same as those in the main study. Based on the results of the pilot study and considering the time constraint, 15 relatively discriminating phrases were chosen as the test items for the main test (Table 2). These phrases were also used as query phrases listed in a worksheet. Students were required to consult the assigned tools to collect paraphrases and take notes for each query phrase.

To avoid the effect of short-term memory, the query phrases in the test sheets and the worksheet were identical except for their order. Moreover, the example sentences used in the pre-test, post-test and the worksheet were entirely different.

Additionally, to gain a deeper insight into learners' vocabulary learning behaviors, students were interviewed. The interview questions involved how they learned vocabulary, what difficulties they might encounter when they used paraphrases, and how they dealt with the test questions.

Data Collection Procedure

The instruments adopted to compare with PREFER included the Longman English Dictionary Online, Yahoo! Dictionary and Google Translate. The Longman English Dictionary Online and Yahoo! Dictionary, both offering a fair number of collocations, phrases and example sentences, are popular among EFL learners. Google Translate is another popular machine translation service which many language learners favor. Note that the control group was allowed to consult one of or all of the online tools.

A complete administration of this task took 100 minutes. First, all students were given a pre-test (15 minutes). Then the students were introduced to all the reference tools and were asked to familiarize themselves with these tools using three example query phrases. Upon completion of these instructional steps, the students were randomly assigned to the experimental (Group P consulted PREFER) or control (Group C consulted online tools) group. In the next 55-minute treatment phase, two activities were involved. During the first 30 minutes, both groups needed to consult the assigned tools to collect paraphrases for each query phrase listed on the worksheet and to note at least three paraphrases and usage information. In fact, they were encouraged to find as many paraphrases as possible. In the follow-up phase, they were to memorize the paraphrases they had collected and the usages thereof. For the remaining 15 minutes, all participants were given a post-test. Note that during the pre- and post-tests, no tool support was allowed.

RESULTS

In this study, we examined learners' gains of phrasal paraphrases in terms of size, form and use. Specifically, students' worksheets were reviewed to determine their gains in the number of paraphrases they collected, whereas students' test sheets in the pre-and post-tests were compared to examine their improvements in phrasal paraphrase learning.

Importantly, learners' difficulties in learning phrasal paraphrases deserve investigation. Thus, we analyzed students' test sheets together with the interview results to examine student usage errors and identify the possible causes.

Students' Gains in Terms of the Number of Phrasal Paraphrases

To answer the first research question, the number of paraphrases Group P and Group C collected in 30 minutes were compared. We scrutinized and counted the number of paraphrases for the 15 query phrases that students noted on their worksheets. The total numbers of paraphrases collected by Group P and Group C were 405 and 330 while the average numbers of paraphrases were 2.94 and 2.18, respectively. Independent sample t-test results showed a significant difference (t (15) =7.293, p value < 0.001) between the number of paraphrases the two groups noted, indicating Group P collected more paraphrases than Group C in the same time frame. The number of paraphrases the two groups of students collected for each query phrase is shown in Figure 2.
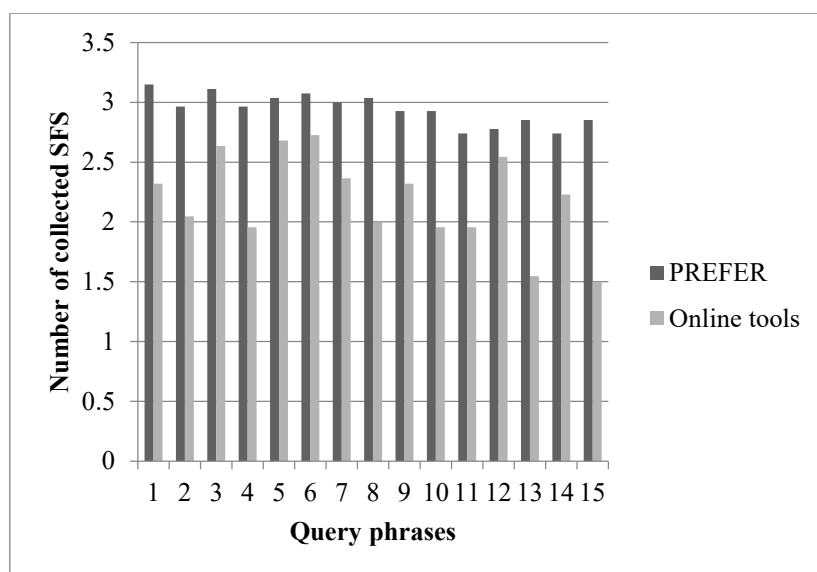

Figure 2. Number of paraphrases for the 15 query phrases students collected

Next, the distribution of the number of collected paraphrases noted on the students' worksheets was investigated. As seen in Figure 3, 90.4% of Group P were able to collect three paraphrases with the help of PREFER, whereas 55.2% of Group C achieved the same performance via consulting the existing online tools. Meanwhile, 3.2% of Group P did not note any paraphrases while 16.1% of Group C noted nothing on the worksheets. The results indicated that the PREFER system is able to suggest more paraphrases than the existing online tools in the same amount of time. It can be inferred that the efficiency of collecting available paraphrases allowed learners more time to familiarize themselves with the use of individual phrases.
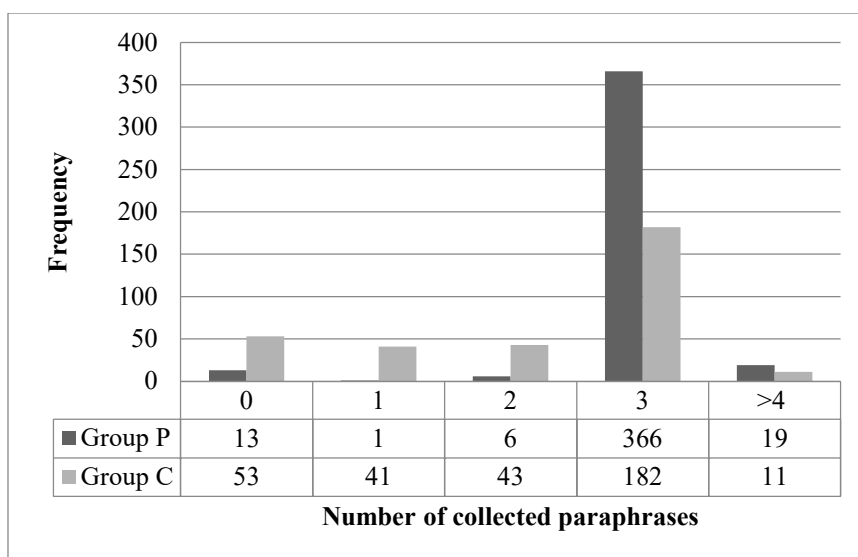

	0	1	2	3	>4
■ Group P	13	1	6	366	19
▨ Group C	53	41	43	182	11

Number of collected paraphrases

Figure 3. Distribution of the collected paraphrases of the two groups

The inherent limitation of the existing online tools may have affected the performance of Group C. Single-word queries with both Longman English Dictionary Online and Yahoo! Dictionary necessitated several more trials to find the desired phrase(s). On the other hand, while allowing multi-word input which supports faster consulting, Google Translate returns only one corresponding translation at a time. Taken as a whole, consultation of traditional reference tools was time-consuming. This,

coupled with insufficient information, explains why Group C's paraphrasing collecting task was underperforming. In contrast, both multi-word input and abundant paraphrase suggestions made PREFER more efficient for Group P to collect paraphrases.

Since PREFER contributed to the number of phrasal paraphrases, whether it benefitted students' vocabulary knowledge yielded more significant concerns. This is discussed in the second research question.

Students' Gains in Terms of the Knowledge of Phrasal Paraphrases

The second research question investigates whether and to what extent the PREFER system benefits students' learning of paraphrases. To see students' improvements, the mean scores in the pre- and post-tests were used as performance indicators. Results revealed that students' pre-test scores (M = 56.47, SD = 7.08) and post-test scores (M = 62.18; SD = 7.33) differed significantly (F (1, 96) = 15.398, p value < 0.001). This indicated that all students showed significant improvements when tool assistance was provided.

Table 4

Students' Performance in Terms of Different Tool Support and Proficiency Level

		N	Pre-test Mean (SD)	*F* (*p* value)	Improved score Mean (SD)	*F* (*p* value)
Tool support	Group P	27	56.00 (6.34)	0.260 (0.612)	7.59 (6.13)	4.476* (0.040)
	Group C	22	57.05 (8.01)		3.41 (7.71)	
Proficiency level	Highly	25	62.16 (4.41)	103.125* (<0.001)	2.44 (6.02)	113.588* (<0.001)
	Less	24	50.54 (3.53)		9.13 (6.67)	

Note. Full marks = 90.00. *p* <.05.

Subsequently, we investigated students' performances in terms of the

tools they consulted. First of all, the performances of the students who consulted differing tools were compared. As can be seen in the first panel of Table 4, Group P (n = 27) and Group C (n = 22) did not show any significant difference in the pre-test (F (1, 47) = 0.260, p value = 0.612), which verified that the students were randomly grouped. In the case of the improved scores, two groups differed significantly (F (1, 47) = 4.476, p value = 0.040). Clearly, Group P (M = 7.59, SD = 6.13) outperformed Group C (M = 3.41, SD = 7.71), which indicates that PREFER was of greater benefit for helping learners acquire paraphrases as compared with the online tools used.

Next, the performances of the students with different proficiency levels were examined (the second panel of Table 4). The pre-test mean score (56.47) was used as the basis to determine students' proficiency levels. Analyses revealed that the score improvements of the highly (n = 25) and less (n = 24) proficient students were significantly different (F(1, 47) = 13.588, p value < 0.001). This indicated that less proficient students made greater progress (M = 9.13, SD = 6.67) as compared with their highly proficient counterparts (M = 2.44, SD = 6.02). Not surprisingly, with tool support, the less proficient students improved more markedly than their highly proficient counterparts. In other words, for the students who need extra help becoming engaged learners, all the introduced tools served useful purposes very well.

To further understand which tool was of greater benefit to the less proficient students, the relationship between students' proficiency levels and the tools they consulted was investigated. ANOVA did not show a significant interaction effect between these two independent variables (F(1, 45) = .36, p value = 0.554). It indicated that students benefitted from PREFER more than from the existing reference tools regardless of their proficiency level. In short, the automatically grouped paraphrases along with the usage information directly and effectively benefitted learners' vocabulary expansion (McInnis, 2009).

Students' Usage Problems and Possible Causes

The third research question looks into students' usage errors and investigates the possible causes. A McNemar's test was conducted to assess if the scores of Group P and Group C in the pre-and post-tests were significantly different from each other. Note that the top score of each alternative in the individual test item is equal to the number of the students.

Only two out of 15 test items are discussed because neither of these groups showed significant differences in the scores of each option. To gather the contributory factors, interviews were conducted just after the end of the experiment. Each interview was conducted face-to-face between the student and the researcher. Four students (one highly and one less proficient student from Group P, whereas one highly and one less proficient from Group C) were interviewed; others had classes to attend.

Table 5

Learner Performance on "There Is No Doubt That"

		Group P (27)			Group C (22)		
		Pre-test	Improved score	|Z| (*p* value)	Pre-test	Improved score	|Z| (*p* value)
1.	Undoubtedly,	27	-2	1.414 (0.157)	21	0	0.000 (1.000)
2.	Doubtless,	6	4	1.265 (0.206)	13	2	0.707 (0.480)
3.	There's no question that	25	-1	0.577 (0.718)	20	-2	1.414 (0.157)
4.	* It is no question that	19	0	0.000 (1.000)	14	-3	1.134 (0.257)
5.	It is beyond doubt that	26	-1	0.577 (0.564)	18	-2	1.000 (0.317)
6.	* There is beyond doubt that	25	-4	1.633 (0.102)	17	-3	1.134 (0.257)
		128	**-4**		**103**	**-8**	

Note. "✗" indicates the distractor. **p* <.05.

Table 5 shows the results of the query phrase "there is no doubt that". The six alternatives were divided into three pairs. The first pair examined students' attention to word form, and the other two pairs examined students' knowledge of the constituents of individual phrases. For the first alternative in the first pair, all Group P students achieved the top score in the pre-test; however, two students lost their confidence in their choices in the post-test. At the same time, Group C did not show progress in the

post-test. Regarding the second alternative, although overall performance was improved, only ten Group P students and 15 Group C students provided correct answers. All the interviewed students shared the view that they were confused about whether there is an "-ed" ending in "undoubtedly" and whether "-ly" should be added to "doubtless" mainly because they paid little attention to word endings while learning vocabulary. These results corroborated the findings of previous studies that the unstressed phonemic constituents were incompletely grasped while learning formulaic sequences or phrases (Peters, 1977; Wray, 2002).

On the other hand, the use of expletive subjects "there is" and "it is" were the focuses of the second and third pairs. Group P students' performances appeared satisfactory in the pre-test; however, they did not make any progress after the treatment. Similarly, Group C showed no improvements. It appeared that students had difficulties with expletive constructions. According to the interviewed students, they tended to pay closer attention to the content words rather than function words when they learn vocabulary. One more possible reason for Group C's unsatisfactory performance was the tools they consulted. The online tools only suggested "undoubtedly" and "doubtless". However, other paraphrases such as "there is no question that" or "it is beyond doubt that" were not available. Such limited information would hinder learners' development of vocabulary knowledge.

Table 6

Learner Performance on "Is Worth Reading"

		Group P (27)			Group C (22)		
		Pre-test	Improved score	|Z| (*p* value)	Pre-test	Improved score	|Z| (*p* value)
1.	* is worthy reading	22	-5	1.667 (0.096)	20	-4	1.333 (0.182)
2.	* is worthy to read	8	5	1.508 (0.132)	7	2	1.000 (0.317)
3.	is worthy of being read	23	-3	1.000 (0.317)	18	1	0.447 (1.345)
4.	is worthwhile to read	14	0	0.000 (1.000)	16	-3	1.134 (0.257)
5.	is worthwhile reading	15	-3	0.832 (0.405)	8	-1	0.378 (0.705)
6.	* is worthwhile to reading	22	-2	0.816 (0.414)	17	-1	0.378 (0.705)
		104	**-8**		**86**	**-6**	

Note. "✗" indicates the distractor. **p* <.05.

The other query phrase that troubled learners was "is worth reading". Similarly, Table 6 summarizes the performances of the two groups. The six alternatives were divided into two sets. As seen in the first set, more than 80 percent of Group P students demonstrated good performance before the treatment on alternatives 1 and 3. However, some students lost their confidence after the treatment. Group C showed a similar trend. For alternative 2, only 13 Group P students and nine Group C students provided correct answers after the treatment. In the second set, all the alternatives appeared to be problematic for quite a few students. Taken together, the students shared the frustration with the usage of "is worthy" and "is worthwhile". The students said that their focuses were usually kept on content words rather than function words when they learned phrases, as discussed above. For this reason, they had difficulties determining the proper word usages when these phrasal phrases were displayed together. They opted for analyzing or even generalizing grammar rules. This finding

is consistent with that of Wood (2010).

Both qualitative and quantitative analyses shed some light on learners' difficulties as well as the causes of the errors in paraphrase learning. Overall, the errors students made fall into two dimensions: form and use. Several studies indicate that language learners often have trouble with the word form during vocabulary acquisition (Laufer, 1990; Schmitt, 2008), and suggest that word form should be a major focus instead of "just be an 'add-on' to meaning" (Schmitt, 2008, p. 336). In terms of use, learners are prone to put together words from their vocabulary inventory of individual items with grammar analysis, which is highly likely to lead to incorrect usage and unidiomatic expressions (Chen et al., 2014).

CONCLUSION

The current study aims to promote phrasal paraphrase learning because it substantiates several memory strategies to consolidate vocabulary knowledge. To achieve this goal, we introduced the PREFER system, which suggests paraphrases along with usage information and example sentences.

A multi-select task was conducted with 49 college students. Students demonstrated significant improvements in phrasal paraphrase learning with the assistance of the system regardless of their level of proficiency. It can be inferred that phrasal paraphrase learning could widen and deepen learners' vocabulary knowledge.

Pedagogical Implications

Students' usage errors deserve instructors' attention. Form and use are two important issues in EFL leaners' vocabulary learning. Researchers suggest that lexical phrases be explicitly taught and consciously learned (Alali & Schmitt, 2012; Nesselhauf, 2003; Wood, 2010). Likewise, paraphrases need to be learned intentionally. The findings of the current study suggest that computer assisted phrasal paraphrase learning is effective and beneficial to vocabulary learning. Several activities could be performed using PREFER in the classroom. For example, to raise learners' awareness of word form and use, students could be provided with content words of paraphrases and attempt to associate the content words with their coordinates via consulting PREFER (Chen et al., 2014; Kennedy & Blanchet, 2014). Another viable activity is to encourage students to do the

sentence production task using paraphrases. In so doing, learners could facilitate various phrases to restate their ideas, which can further consolidate their knowledge in terms of meaning, form and use.

Limitations and Future Work

Despite its exploratory nature, this study shed light on the effectiveness of learning phrasal paraphrases on expanding and consolidating vocabulary knowledge. However, more work will be worth doing to provide more definitive evidence. For example, the number and the variety of the test items could be increased. A more heterogeneous group of students could be included, which may help us further examine whether less proficient students benefit more than their highly proficient counterparts (Thompson, 1987). Alternatively, a comparison of the effects of grouped and scattered paraphrases on vocabulary expansion could be performed in future research. Last but not least, it would be useful to explore how many paraphrases should be introduced at a time to minimize the memory load of learners and thus yield a better learning performance.

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代換短語學習：探究有效強化詞彙知識策略

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詞彙知識在語言學習上扮演了重要的角色。有許多學者提出不同的策略來強化詞彙學習，其中，語意相近的詞彙一起學習是重要的詞彙記憶策略之一。與此同時，學習詞彙短語相較於學習單字更有助於記憶。有鑑於此，本研究提出群集式代換短語學習。我們導入一語料庫為本的代換短語建議系統 PREFER，此系統不僅建議同義的詞彙短語，也提供個別詞彙短語的用法及例句。英語學習者透過對比的方式，學習詞彙短語的用法。如此一來，不但學習者的詞彙量可以擴充，也有助於他們察覺詞彙的形式及用法。本研究利用前後測比較來評估 49 位大一學生的學習成效，結果顯示在導入系統輔助學習後，學生的詞彙知識有顯著進步。除此之外，我們也分析學生的錯誤並探究背後可能的原因。本研究初探了強化詞彙知識策略，相信目前的成果有助於詞彙擴充相關研究。

關鍵詞：詞彙短語、代換短語、詞彙知識、詞彙強化策略