

An Investigation of High School EFL Learners' Knowledge of English Collocations

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Abstract

Vocabulary knowledge is an important tool for second language learners. Specifically, in order to communicate effectively, learners need to know collocations, a group of associated words. This study investigated Thai high school learners' receptive and productive knowledge of English lexical and grammatical collocations. Three hundred and fourteen participants, who voluntarily participated in the study, were given four different measures of receptive and productive knowledge of English collocations. Descriptive and inferential statistics were used to analyze the quantitative data and a correlational analysis was also used to examine the relationship between receptive and productive knowledge of English collocations. The results showed that Thai EFL high school participants had relatively weak knowledge of English collocations, but performed better on receptive collocational tasks than productive tasks. Indeed, Thai EFL high school participants' receptive knowledge of grammatical collocations appears to be acquired first, followed by receptive knowledge of lexical collocations, productive knowledge of lexical collocations, and productive knowledge of grammatical collocations. A correlational analysis also revealed that receptive and productive collocational knowledge were interrelated. Taken together, these findings are consistent with previous studies showing that, like vocabulary, receptive collocational knowledge is acquired before productive collocational knowledge. This study provides insights into vocabulary acquisition and development along the receptive and productive continuum. Future research would benefit from longitudinal studies designed to examine more precisely this developmental continuum.

Keywords: English collocations, Lexical collocations, Grammatical collocations, Receptive knowledge, Productive knowledge

INTRODUCTION

Vocabulary knowledge is an important tool for second language (L2) learners and limited L2 vocabulary knowledge can impair a learner's ability to engage in effective communication (Alqahtani, 2015). To communicate successfully, learners must know and

select appropriate vocabulary to convey meaning fluently and naturally (Krashen & Terrell, 1995). In vocabulary acquisition, collocations are often defined as combinations of words associated with each other (e.g., Firth, 1957; McCarthy & O'Dell, 2017). For example, *heavy rain* and *strong rain* are both syntactically correct, but *heavy* is an appropriate collocation to use with *rain* (Benson et al., 2010).

Learners must know collocations to naturally use a language (Károly, 2005) rather than just learning single English words (Celce-Murcia et al., 2013). Knowledge of collocations can improve a learner's language use and develop fluency and native-like selection. Also, collocations can help language learners to be understood by native speakers. However, L2 vocabulary research has shown that English collocations are particularly difficult for learners to master (Nesselhauf, 2003). When collocations were compared to general vocabulary, it was found that learners have more difficulty acquiring collocations because of inadequate exposure and an inability to understand the meaning of the collocation in different contexts (Nesselhauf, 2003; Tran, 2012). For example, English majors and non-English majors make grammatical collocations errors, especially preposition + noun, and also show significant errors on lexical collocations, in particular verb + noun (Ying, 2009).

In a Thai context, research on collocations in English is viewed as one of the most neglected areas in vocabulary learning and teaching (El-Dakhs, 2015; Sridhanyarat, 2018). However, it has been shown that Thai university learners have difficulty with receptive and productive collocational proficiency tests (Detdamrongpreecha, 2014). More specifically, learners could identify which words were nouns, adjectives, or verbs, but they could not use them effectively in context. The current Thai national curriculum states that high school learners need to know essential English collocations for daily communication. In this regard, the national test for high school graduates also includes collocations in English on the Ordinary National Educational Test (O-NET) and all high school students are required to sit this test before graduation (Ministry of Education, 2008). However, the overall performance on the O-NET exam for high school graduates is relatively low (National Institute of Educational Testing Service [NIETS], 2020). The lack of collocation knowledge in Thai high school students may account for this poor English national exam performance. Moreover, research has shown that Thai EFL learners lack collocational knowledge and they have difficulty learning and using collocations (Bahardoust, 2012; Begagić, 2014; Hsu & Chiu, 2008; Laufer & Waldman, 2011; Nesselhauf, 2005; Nguyen & Webb, 2016). However, little effort has been made to examine collocational knowledge in Thai high school students. Understanding English collocation acquisition is of great importance for researchers and practitioners, since it could shed light on the nature of collocation acquisition and the role of collocation knowledge in vocabulary development.

LITERATURE REVIEW

Construction of Collocations

Collocations, first defined by Firth (1957), are a group of associated words. In general, words are not combined randomly and, even though words must follow specific grammar and syntax, they also have preferred partners. For example, *heavy rain* and *strong rain*

are both syntactically correct, but *heavy* is an appropriate collocation used with *rain* (Benson et al., 2010). More recently, Lewis (1993) defined collocations as a group of words that generally occur together and McCarthy and O'Dell (2017) state that collocations are groups of words that are frequently observed together. For example, *do* and *homework* are often paired, *tall* goes with *boy* or *girl*, and *high* goes with *mountain*.

Collocations are separated into grammatical and lexical collocations, based on the word class of the combining words. A grammatical collocation is a combination of a content word (e.g., noun, verb, adjective) and a function word (e.g., preposition, complementizer) (Benson et al., 2010; Lewis, 2000). *Believe in* is an example of a grammatical collocation where *believe* is a content word and *in* is a function word. Other examples of grammatical collocations included *at night*, *extend to*, *good at*, *fall for*, and *to be afraid*. These grammatical collocations are lexicalized as single units whose meanings are formulaic and whose co-occurrence is highly likely. Grammatical collocations can also be idiomatic because their meanings are different from the literal meaning of those words. For example, *run out of* (to reach the end of stock) or *put up with* (tolerate) (Bahns, 1993). According to Benson et al. (2010), there are eight categories of grammatical collocations: noun + preposition, noun + to infinitive, noun + that clause, preposition + noun, adjective + preposition, predicate adjective + to infinitive, adjective + that clause, and 19 English verb patterns.

By contrast, a lexical collocation refers to a combination of content words: nouns, verbs, adjectives, adverbs. Unlike grammatical collocations, lexical collocations typically exclude prepositions, infinitives, or clauses. Take *strong coffee* as an example. The word *strong* is an adjective, whereas the word *coffee* is a noun. Another example of a lexical collocation is *tie the rope* where *tie* is a verb, and *the rope* is a noun. Benson et al. (2010) categorized lexical collocations into seven types: verb (usually transitive) + noun/pronoun/preposition phrase, verb (which means eradication/nullification) + noun, adjective + noun, noun + verb, qualifier + noun, adverb + adjective, and verb + adverb. This classification is universally accepted and has been used in several studies (e.g., Bahardoust, 2012; Alsulayyi, 2015; Shamsudin et al., 2013; Talakoob & Koosha, 2017; Sangeen, 2019).

In vocabulary learning, vocabulary knowledge is classified into receptive and productive knowledge. Receptive vocabulary knowledge refers to the ability to recognize a form-meaning link of a word, whereas productive vocabulary knowledge involves the ability to retrieve or recall a word and use it in the appropriate context (Schmitt & Meara, 1997; Schmitt & Zimmerman, 2002; Sukying, 2017, 2018a, 2018b, 2020). In the current study, receptive knowledge of English collocations refers to the ability to choose a correct collocate among different options to form a correct collocation. In contrast, productive knowledge of English collocations was the ability to recall lexical items and to complete a fill-in-the-blank task to form the correct collocation.

Roles of English collocations in language learning

Vocabulary knowledge allows learners to communicate fluently and accurately. Indeed, a single word is not sufficient for learners to communicate efficiently, and learners must

know word combinations or collocations to use a language naturally (Károly, 2005). Moreover, learners must use collocations and expressions suitable for different contexts (Deveci, 2004). For instance, the sentence *How is it going?* is informal and should not be used in formal situations but it can be used to greet friends. Therefore, knowledge of connotation and formality is necessary to allow the speaker to choose the appropriate collocations given the context as well as the difference in status and social distance between the speaker and the listener.

Collocations and idiomatic expressions are essential for learners to communicate. If learners lack knowledge about collocations, communication will be impeded. Collocation knowledge can also bridge the gap between grammar and vocabulary (Scrivener, 2005). Indeed, collocations are the most common of English multi-word expressions and comprise more than 70% of what people speak, hear, read, and write are collocations (Hill, 2000). However, collocations are often arbitrary. For instance, it is accurate to say *make the bed*, but not *do the bed*. People say to *turn on the light*, but they do not say to *open the light*. As such, it is difficult for EFL learners to learn and use collocations effectively because they have limited exposure to these collocations in classroom practice (Benson et al., 2010; Lewis, 1997). Furthermore, collocations are challenging to predict and acquire because L2 learners must remember lexical and grammatical collocations as single items.

To conclude, knowledge of collocations is an essential aspect of language competence. Collocations are arbitrary, frequently occur in daily communication, and it is often difficult to predict their meaning. EFL teachers should introduce new vocabulary as a chunk and emphasize active collocations. Explicit teaching of collocations in the classroom will help learners reduce their processing load and foster adequate comprehension and production of the target language (Boonyasquan, 2006).

Previous research on collocations

Previous studies have found that learners lack collocational knowledge, which may cause difficulties at advanced language levels, impede their communication skills and affect their writing performance (Bahardoust, 2012; Begagić 2014; Laufer & Waldman, 2011; Nesselhauf, 2005; Nguyen & Webb, 2016). At all proficiency levels, English learners also have difficulty learning and using collocations, and Thai learners of English do not possess sufficient knowledge of collocations (Hsu & Chiu, 2008; Mallikamas & Pongpaioj, 2005; Yumanee & Phoocharoensil, 2013).

Learners may suffer difficulties with using collocations because vocabulary teaching and learning is often focused on single-word items. Moreover, collocations are a problematic aspect of vocabulary knowledge for EFL learners because they cannot be separated into constituent parts, such as suffixes, prefixes, and roots. Instead, EFL learners have to learn collocations as a whole (Hosseini & Akbarian, 2007). As such, learners may not have sufficient exposure to the multi-word unit and may not understand the meaning of collocations in different contexts (Tran, 2012). Moreover, teaching methods often focus on structure or grammar with little emphasis on the importance of collocations in language learning (Begagić, 2014; Sridhanyarat, 2018).

Several studies have examined receptive and productive knowledge of collocations. It has been shown that learners' receptive knowledge of collocations is greater than their productive knowledge of collocations (Begagić, 2014; Bueraheng & Laohawiriyanon, 2014). It also appears that learners' competence in collocations differs as a function of the type of collocations. For instance, Bahardoust (2012) found that Iranian ELF learners performed better on lexical collocations than grammatical collocations, especially adjective + noun as this type of collocation may not be affected by the native language (L1). However, other studies found that grammatical collocations are more difficult than lexical collocation (Jabbour-Lagoeki, 1990; Alsulayyi, 2015). This is in part because the grammatical collocations combine a content word and a function word, which is commonly a preposition (Benson et al., 2010; Lewis, 2000). Such combinations are difficult for EFL learners to acquire. For example, it is said that he *lies in bed* but *on the couch*. Another example is using the preposition *in* instead of *at* in the sentence; i.e., I became skillful *in drawing* (Moehkardi, 2002, Mongkolchai, 2008). In this regard, grammatical collocations can be difficult to acquire.

In general, teaching groups of words is better than teaching single words (Nizonkiza et al., 2013) and a classroom practice including frequent collocations is beneficial for learners' collocational knowledge development (Talakoob & Koosha, 2017; Sridhanyarat, 2018). Classroom tasks and activities, such as essay writing and conversation activities, could scaffold learners' collocational knowledge (Bahardoust, 2012; Bueraheng & Laohawiriyanon, 2014). Previous research has highlighted the importance of classroom practice to provide learners with exposure and opportunities to use collocations (Begagić, 2014). However, few studies have been conducted to investigate learners' English collocations, particularly in Thai EFL contexts. Understanding learners' current knowledge of collocations in English may shed light on the nature of collocational knowledge acquisition and provide a clear picture for pedagogical practice. As such, the current study investigated EFL learners' English collocations. Specifically, this study focused on lexical and grammatical knowledge of collocations among Thai EFL high school learners. Three research questions were formulated:

1. What is Thai high school EFL learners' receptive and productive knowledge of English collocations?
2. What is Thai high school EFL learners' knowledge of lexical and grammatical collocations?
3. Is there any relationship between receptive and productive knowledge of English collocations in Thai high school EFL learners?

METHODOLOGY

Participants

The current study was conducted in a high school in northeastern Thailand with a population of 1,038 Thai EFL senior high school learners. Convenience sampling was used in this study. Based on this sampling method, 536 senior high school learners volunteered to participate in the study. However, due to a lack of internet access on the test days, only 314 participants could complete all four tasks. Therefore, the data analysis was based on the responses of 314 participants. The participants were Thai EFL high

school learners in tenth, eleventh, and twelfth-grade, and had never been taught English collocations before the data collection procedure. Each class consisted of 40 to 50 learners who were Thai native speakers. The participants had studied English approximately four hours per week, including a three-hour English class with a Thai EFL teacher and a one-hour English class with English native speakers.

Research instruments

Four tests were used in this current study. The COLLEX test and the COLLMATCH test were used to measure learners' receptive knowledge of English collocations, whereas the Collocation recall test and the CONTRIX test assessed learners' productive collocational knowledge. The COLLEX and the Collocation recall test focused on three types of lexical collocations: adjective + noun, verb + adverb, and verb + noun. The COLLMATCH and the CONTRIX concentrated on three types of grammatical collocations, comprising preposition + noun, noun + preposition, and verb patterns.

The target collocations used in each test were based on Benson et al.'s (2010) concept of collocations, which includes both lexical and grammatical collocations. The target collocations were determined using the O-NET test of academic years 2017 to 2019 for upper high school learners (NIETS, 2018, 2019, 2020). The most frequent types of collocations for EFL learners in the O-NET test, which are lexical collocations (adjective + noun, verb + adverb, and verb + noun) and grammatical collocations (preposition + noun, noun + preposition, and verb patterns), were included in the tests (NIETS, 2018, 2019, 2020). The level of difficulty of the target collocations was set at the B1 and A2 CEFR levels (Common European Framework of Reference for Languages) (Council of Europe, 2001), which is appropriate for upper high school learners.

The COLLEX test (Collocation lexis test) measured receptive lexical collocations. Specifically, this test was developed based on a previous study (Gyllstad, 2009) and measured the learner's receptive knowledge of lexical collocations, which focused on adjective + noun, verb + adverb, and verb + noun. The test was presented in a multiple-choice format, and participants had to choose the item (out of three items) that they thought was the most frequent and natural collocation. The test included 20 items for each type of lexical collocations, and the total was 60 items. If participants choose the correct English collocations, they receive one point. An example of the item used in this test is shown below.

1. a. *strong* coffee b. *powerful* coffee c. *energetic* coffee

The COLLMATCH test (Collocate matching test) was also developed based on previous research (Gyllstad, 2009) and measured receptive grammatical collocations, including preposition + noun, noun + preposition, and verb patterns. This test was a yes/no format and participants must respond Yes if the given word is correct or No if it is incorrect. The test included 20 items for each type of grammatical collocations, with a total was 60 items. The participants were awarded one point for each correct answer. Examples are provided below.

1. damage *on*

	yes
	no

2. *at* the job

	yes
	no

3. start *from*

	yes
	no

The Collocation Recall test was developed based on the previous study of Szudarski (2012) and measured productive knowledge of lexical collocations, including adjective + noun, verb + adverb, and verb + noun. This test used the same target collocations as the COLLEX test. The participants were required to translate the meaning of English collocations in Thai into English. The test included 15 items for each type of lexical collocations, with a total of 45 items. One point was awarded for each correct answer. Examples are provided below.

1. คุณภาพแย่ _____ quality
2. กระซิบเบาๆ whisper _____
3. ทำการบ้าน _____ homework

The CONTRIX test (Constituent matrix test) was developed based on Revier (2009) and measured productive grammatical collocations, including preposition + noun, noun + preposition, and verb patterns. This test used the same target collocations as the COLLMATCH test. It was presented in a 'fill-in-the-blank' format, and participants were asked to choose the appropriate answers to complete the given sentence. The test included 15 items for each type of grammatical collocations, giving a total of 45 items. One point was awarded for each correct response. An example of a test item is provided below.

My father has ____ A ____ B ____ the computer.

- | | | | |
|----|--|----|------------------------------|
| A. | 1. annoyances
2. disadvantages
3. difficulties | B. | 1. with
2. of
3. about |
|----|--|----|------------------------------|

Data collection procedure

Before the main study, all the tests were piloted with a different cohort of participants, who had similar demographic information. None of these participants were involved in the main study. Furthermore, a reliability analysis was performed on the test items, which indicated a high degree of internal consistency across the items. More specifically, Cronbach's Alpha coefficients of 0.89, 0.93, 0.71 and 0.90 were identified on the COLLEX, Collocation Recall, COLLMATCH and CONTRIX, respectively. The content validity of the tests was also confirmed by seven raters who had more than 10 years of experience in teaching English in Thai EFL contexts. Based on these ratings, some test items were slightly modified to refine the semantic and grammatical transparency of the tests.

Due to the COVID-19 pandemic, participants completed the tests via online systems (Google forms and Microsoft team). The participants were given the productive knowledge of lexical collocations test (Collocation recall test), followed by the receptive knowledge of lexical collocations test (COLLEX test). The next day, the participants were given the productive knowledge of the grammatical collocations test (CONTRIX test) and the receptive knowledge of the grammatical collocations test (COLLMATCH test). Participants were given 35 minutes to complete the productive test and 25 minutes for the receptive test. Productive knowledge tests were provided to all participants before

the receptive knowledge tests to ensure that participants did not transfer knowledge from a receptive test to a productive test (Laufer & Goldstein, 2004). During the tests, participants were required to open their camera via Microsoft team meeting to ensure that they did not find the answers from other sources. Also, participants needed to submit the answers on time, and Google forms were closed after 60 minutes. A summary of the data collection procedure is shown in Table 1.

Table 1. Summary of the data collection procedure

Day	Productive knowledge	Time (mins)	Receptive knowledge	Time (mins)
1	The Collocation recall test	35	The COLLEX test	25
2	The CONTRIX test	35	The COLLMATCH test	25

RESULTS

Receptive and productive knowledge of English collocations in Thai high school EFL learners

Receptive and productive tests of lexical and grammatical collocations were used to examine participants' knowledge of English collocations. Descriptive statistics were calculated, including the mean score, percentage, and standard deviation (SD). A paired-samples t-test was used to detect any significant differences between the four tests, and the effect size was also calculated. The raw total test scores of the four tests were then converted into percentages for data analyses. Table 2 illustrates Thai high school EFL learners' receptive and productive knowledge of English collocations.

Table 2. Thai high school EFL learners' receptive and productive knowledge of English collocations

Types of collocations		Tests	Mean	SD	<i>t</i>	Effect-size
Lexical	R	COLLEX	34.50 (57.50%)	9.05	22.88	1.44
	P	Collocation recall	22.39 (49.75%)	9.52		
Grammatical	R	COLLMATCH	36.20 (60.33%)	4.46	40.02	2.52
	P	CONTRIX	17.66 (39.25%)	9.20		

Note: R = receptive knowledge, P = productive knowledge, $p < .001$

The COLLEX and COLLMATCH tests measured the participants' receptive knowledge of lexical and grammatical collocations, respectively. By contrast, the Collocation recall test and CONTRIX test measured productive knowledge of lexical and grammatical collocations, respectively. Overall, the results showed that participants performed better on the receptive measure of English collocations, indicated by higher average scores than on the productive measure of English collocations. Specifically, the COLLEX test performance (57.50%) was higher than the Collocation recall test performance (49.75%) in the knowledge of lexical collocations. Similarly, for grammatical collocations, the COLLMATCH test performance (60.33%) was higher than the CONTRIX test performance (39.25%).

A paired-samples t-test was used to examine any significant differences between performance on the receptive and productive tests. The effect size was also calculated to

indicate the strength of the difference between receptive knowledge and productive knowledge. As shown in Table 2, the mean scores of receptive and productive knowledge of lexical collocations on the COLLEX and the Collocation recall test performance were significantly different ($t = 22.88, p < .001$), with a large effect-size ($d = 1.44$). Furthermore, there was a significant difference between receptive and productive knowledge of grammatical collocations on the COLLMATCH and the CONTRIX test ($t = 40.02, p < .001$), with a large effect-size ($d = 2.52$). Thai high school EFL learners' knowledge of lexical and grammatical collocations is presented in Table 3.

Table 3. Thai high school EFL learners' knowledge of lexical and grammatical collocations

Types of collocations		Tests	Mean	SD	t	Effect-size
Lexical	R	COLLEX	56.88	16.57	2.31	0.14
	P	Collocation recall	(54.17%)			
Grammatical	R	COLLMATCH	53.86	12.46		
	P	CONTRIX	(51.29%)			

Note: R = receptive knowledge, P = productive knowledge, $p = .022$

Overall, the results show that participants performed better on the lexical collocations tests than on the grammatical collocations tests, indicated by significantly higher average scores on the COLLEX and Collocation recall tests (54.17%) than the COLLMATCH and CONTRIX tests (51.29%). This suggests that lexical collocations may be easier than grammatical collocations. Indeed, the test performance for lexical collocations was significantly higher than the test performance for grammatical collocations ($t = 2.31, p = .022$), with a small effect-size ($d = 0.14$). A summary of Thai high school EFL learners' knowledge of English collocations is presented in Figure 1.

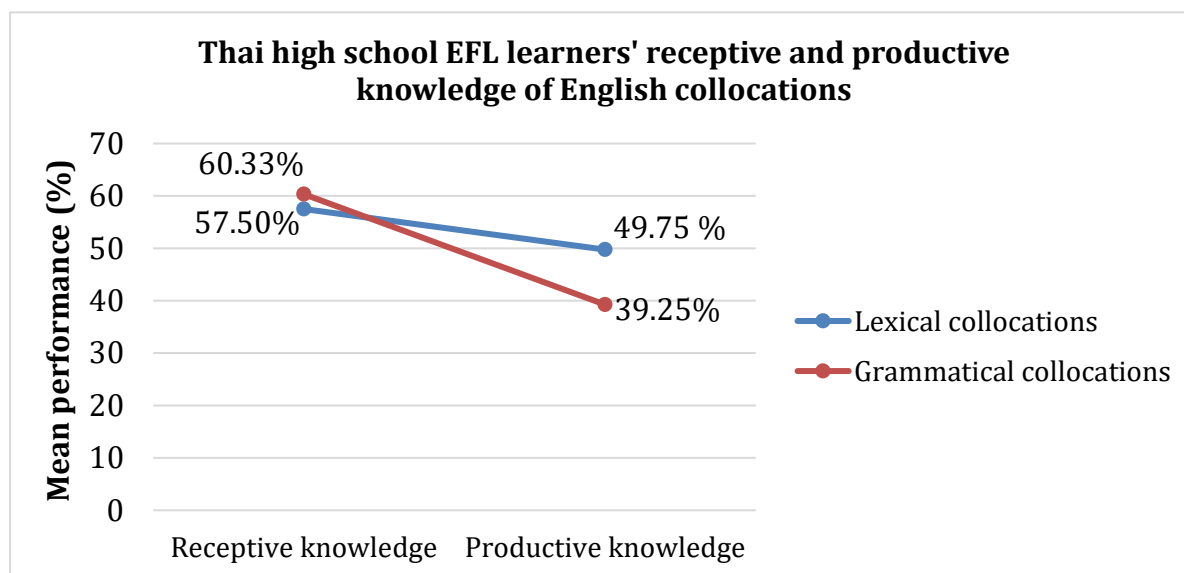


Figure 1. Thai high school EFL learners' receptive and productive knowledge of English collocations

Overall, the results showed that participants achieved higher average performances on receptive collocation knowledge than productive collocation knowledge. Indeed, they performed better on the COLLMATCH test (60.33%), a receptive

measure of grammatical collocations, than on the COLLEX test (57.50%), a receptive measure of lexical collocations. They also performed better on the Collocation recall test (49.75%), a measure of lexical collocations than on the CONTRIX test (39.25%), a measure of grammatical collocations. This suggests that productive knowledge of English collocations is more difficult to acquire than receptive knowledge of English collocations.

Relationship between receptive and productive knowledge of English collocations

A correlational analysis was conducted to examine the relationship between different tests, including lexical and grammatical collocations. Pearson correlations were calculated to examine the strength and the direction (positive and negative) of the relationship between the participants' receptive and productive knowledge of English collocations, including both lexical and grammatical collocations. The correlations are presented in Table 4.

Table 3. Correlations between receptive and productive knowledge of English collocations

Types of collocations		Tests	COLLEX	Collocation recall	COLLMATCH	CONTRIX
Lexical	R	COLLEX	1			
	P	Collocation recall	.593**	1		
Grammatical	R	COLLMATCH	-.041	-.001	1	
	P	CONTRIX	.006	.016	.618**	1

Note: R = receptive knowledge, P = productive knowledge

** Correlation is significant at 0.01 level (2-tailed)

The results of this analysis revealed that the receptive and productive knowledge of English collocations were positively correlated. There was a significant large positive correlation between the COLLEX and the Collocation recall test, which measure receptive and productive knowledge of lexical collocations, respectively ($r = .593$). There was also a significant large positive correlation between the COLLMATCH and the CONTRIX test, which measure receptive and productive knowledge of grammatical collocations, respectively ($r = .618$). However, the correlation between performance on the Collocation recall and the CONTRIX test ($r = .016$), and the COLLEX and the CONTRIX test ($r = .006$), were not significant. Finally, the relationship between the Collocation recall and the COLLMATCH test ($r = -.001$), and the COLLEX and the COLLMATCH test ($r = -.041$), was considered negligible indicating that performance on these tests was not correlated.

Overall, this analysis revealed relationships between receptive and productive knowledge of English collocations. Specifically, the receptive and productive knowledge of each type of English collocations were positively correlated. That is, with an increase in the performance on the receptive knowledge of lexical collocations, performance on productive knowledge of lexical collocations also increases. Similarly, higher performance on the receptive knowledge of grammatical collocations is associated with higher performance on productive knowledge of grammatical collocations. On the other

hand, participants with lower performance on receptive test of lexical collocations tend to have a lower performance on productive test of lexical collocations.

DISCUSSION

Receptive and productive knowledge of English collocations in Thai high school EFL learners

According to the current study results, participants had relatively poor performance on English collocations, both receptively and productively. This indicates that Thai EFL participants do not have sufficient knowledge of English collocations, which could be due to inadequate exposure to collocations. Indeed, teaching and learning single-word items are the main focus of Thai education and, therefore, participants may not understand the meaning of English collocations in different contexts and cannot use collocations appropriately (Tran, 2012). While participants may know single-word items, a lack of collocational knowledge will obstruct their communication skills (Nguyen & Webb, 2016). The current results are consistent with previous studies that second language learners lack collocational knowledge (Begagić, 2014; Dokchandra, 2019; Nguyen & Webb, 2016; Nizonkiza et al., 2013) and that learners find it difficult to predict the meaning of collocations and remember collocations as single items (Boonyasquan, 2006; Hill, 2000).

The results also revealed that participants performed better on receptive measures of collocation knowledge than on productive measures. That is, the ability to recall and produce English collocations appeared more complex than the ability to recognize English collocations, which is consistent with the theoretical framework of vocabulary knowledge acquisition (Laufer & Goldstein, 2004). Producing an English collocation demands the comprehension of collocations. The current results suggest that productive ability requires heavier processing demands than the receptive ability. Indeed, receptive and productive performance lie on a continuum, and knowledge gradually moves from receptive ability towards productive capacity as more is learned about the lexical item (Melka, 1997).

The development from receptive to productive performance is also the result of a fundamental change in the way a lexical item is integrated into the mental lexicon (Meara, 1997). The contextual word knowledge aspects, like collocation and register, are most likely to be delayed in productive knowledge, as acquiring this type of knowledge necessitates a great deal of exposure (Schmitt, 2010). These results are consistent with previous claims that learners find it difficult to use collocations, especially productively, and suggest that teachers should focus on teaching productive knowledge with collocations, such as essay writing and conversation exercises (Begagić, 2014; Bueraheng & Laohawiriyanon, 2014; Chorbwhan & McLellan, 2016).

The analysis of the current findings revealed that participants performed better on lexical collocations than grammatical collocations. The grammatical collocations may have been more difficult to acquire as they combine a content word (e.g., noun, verb, adjective) and a function word (a preposition, a complementizer such as "that") (Benson et al., 2010;

Lewis, 2000) and English prepositions may be difficult for EFL participants to acquire because of L1 interference (Moehkardi, 2002; Boonyasaquan, 2006; Mongkolchai, 2008; Phoocharoensil, 2011). A clear example of L1 interference is the use of the preposition *in* instead of *at* in the sentence, I became skillful *in drawing* (Mongkolchai, 2008). Another example of L1 interference related to preposition use is an incorrect selection of preposition; for instance, when you are *tired with* working and studying, you may need to take a rest. *Tired with* is the grammatical collocation, which is the adjective + preposition. *Tired with* is quite uncommon because the correct preposition after *tired* should be *of*. Thai native speakers may be more likely to use the uncommon *tired with* rather than the more common *tired of* due to interference from their native Thai language, where the word *tired* is frequently followed by the preposition *with* (Phoocharoensil, 2011). Again, consistent with previous studies (Bahardoust, 2012; Sridhanyarat, 2018), while learners have difficulty with English collocations, they perform better on lexical collocations than grammatical collocations.

The types of measurement used to assess participants' collocational knowledge can also affect their performance. The findings indicated that the participants performed better on the grammatical collocations than the lexical collocations on the receptive knowledge test. By contrast, the participants' lexical collocational knowledge was higher than their grammatical collocational knowledge on the productive knowledge test. This phenomenon is partly because identifying the correct English collocations may require easier processing than being asked to choose the appropriate English collocations among given alternatives on the receptive knowledge task. However, selecting the most appropriate and meaningful grammatical collation to complete a given sentence may require heavier processing than providing the L2 meaning for the given lexical collocations. This is consistent with previous reports that test types impact learners' performance on vocabulary knowledge (Laufer & Goldstein, 2004).

The current study showed different difficulty levels of collocational knowledge. This suggests that some types of collocational knowledge may be acquired before others. The results showed that participants' knowledge of English collocations follows a specific sequence. The receptive performance of grammatical collocations seems to be the easiest to acquire, followed by the receptive performance of lexical collocations. Overall, receptive mastery generally develops before productive mastery. The receptive performance of grammatical collocations might be easier than the receptive performance of lexical collocations because it may require less cognitive processing demands (Henriksen, 1999; Sukying, 2017, 2018a, 2018b, 2020). Indeed, participants need only to recognize the form of grammatical collocations and choose the correct items from fewer alternatives than for lexical collocations.

The productive performance of grammatical collocations seems to be the most difficult aspect to achieve, followed by the productive performance of lexical collocations. The productive knowledge of grammatical collocations may require a deeper understanding and heavier cognitive processing demand than the productive knowledge of lexical collocations. That is, not only do participants need to recall and retrieve English collocations to produce them, but they also need to correctly produce these collocations

in different contexts. By contrast, participants only need to provide the L2 meaning for the given lexical collocations on the productive knowledge test of lexical collocations.

Together, the present findings propose a model for the acquisition of English collocations in Thai high school EFL learners and showed that participants' knowledge of English collocations follows a specific sequence. The receptive performance of grammatical collocations is achieved first, followed by the receptive performance of lexical collocations, the productive performance of lexical collocations, and, finally, the productive performance of grammatical collocations. Given that English collocations are not easy to acquire for EFL learners (Nesselhauf, 2003; Supasiraprapa, 2004) this finding suggests that, like for vocabulary, systematic instruction of English collocations would be beneficial for EFL learners (Sukying, 2017, 2018a, 2018b, 2020) and this instruction should focus first on acquiring the easiest sequences before moving to more difficult sequences (Dokchandra, 2019; Sukying, 2017, 2018a, 2018b, 2020). The model of the acquisition of English collocations is illustrated in Figure 2.

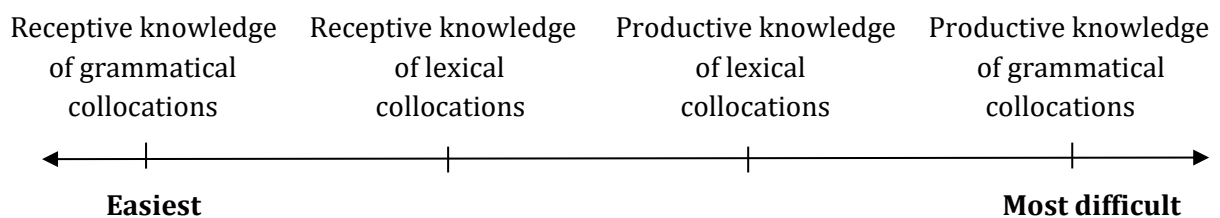


Figure 2. The model of the acquisition of English collocations in Thai high school EFL learners

In summary, like vocabulary, the hierarchy of the acquisition of English collocations is complicated and developmental. For receptive knowledge, grammatical collocations seem to be easier than lexical collocations, but lexical collocations may be easier for productive knowledge than grammatical collocations. While the results are dependent on the types of receptive and productive tests used (Laufer & Goldstein, 2004; Sukying, 2017, 2018a, 2018b, 2020), it appears that learners' receptive collocational knowledge is likely to be greater than their productive collocational knowledge. Indeed, the receptive knowledge of English collocations is a scaffolding mechanism for the productive knowledge of English collocations.

Relationship between receptive and productive knowledge of English collocations

The correlational analysis showed a significant positive relationship between receptive and productive knowledge of lexical and grammatical English collocations. This result is consistent with previous studies showing a positive relationship between receptive and productive knowledge of collocations (Detdamrongpreecha, 2014). That is, when receptive performance increases, productive performance also increases and vice versa. This suggests that when participants can recognize the meaning of English collocations (i.e., receptive ability), they are more likely to appropriately produce the collocation (i.e., productive ability).

In summary, the results showed that collocational knowledge in a Thai context should be improved. The current study's findings revealed Thai EFL participants had poor

collocational knowledge, both receptively and productively. Also, the receptive and productive knowledge of English collocations were positively correlated and that the participants' knowledge of English collocations follows a specific sequence. This suggests that systematic instruction of English collocations would help EFL learners. Indeed, learners need to acquire English collocations rather than single English words to use the English language naturally and fluently (Celce-Murcia et al., 2013). Thus, teaching collocations in a Thai context can be advantageous for EFL learners.

CONCLUSION

This study was primarily conducted to investigate Thai high school EFL learners' receptive and productive knowledge of English collocations. This study also assessed the relationship between receptive and productive knowledge of English collocations in Thai high school EFL learners. It showed that participants performed better on the receptive measure of English collocations than on the productive measure. Moreover, the relationship between the participants' receptive and productive performance on both lexical and grammatical collocations was positively correlated. The present findings propose a model for the acquisition of English collocations in Thai high school EFL learners. That is, the receptive performance of grammatical collocations is achieved first, followed by receptive performance of lexical collocations, productive performance of lexical collocations, and, finally, the productive performance of grammatical collocations. Overall, collocational knowledge is an important aspect of vocabulary acquisition to promote learners' language use and develop fluency and native-like selection. However, at present, collocations have been neglected in the Thai EFL teaching context. Therefore, it will benefit EFL learners if English collocations are integrated into vocabulary teaching and learning.

LIMITATIONS AND RECOMMENDATIONS

An online data collection procedure was used in the current study due to the COVID-19 pandemic. Online collocation tests were conducted via the Microsoft team system and Google forms. Although participants were required to open their camera during the test, participants may have tried to find the answer from other sources. It remains to be determined if the results can be replicated using an "in-person" study. Furthermore, there are many types of lexical and grammatical collocations, and this current study was unable to include all types. Indeed, this study was limited to lexical collocations (adjective + noun, verb + adverb, and verb + noun) and grammatical collocations (preposition + noun, noun + preposition, and verb patterns). Finally, the current study did not use the same tests to measure the receptive and productive performance of lexical collocations and grammatical collocations. This may have also affected the results of the study.

Future research may assess collocation knowledge at different education levels, such as primary, junior high, and university levels. While this current study focused on testing English collocations, future studies may also focus on other aspects, such as the instructions that can help to develop collocational knowledge, learners' attitudes towards collocations, and analyzing English collocations in English books and national tests. This

study assessed knowledge of several lexical (adjective + noun, verb + adverb, and verb + noun) and grammatical collocations (preposition + noun, noun + preposition, and verb patterns). However, other types of collocations exist, and these should also be measured for a more thorough understanding of English collocations. In addition, these findings suggested that participants' performance in the grammatical collocations might be influenced by their L1 (i.e., prepositions), but this study did not aim to investigate the possible L1 interference. Thus, future studies in the Thai context may wish to address the role of LI interference in collocational knowledge. Finally, the collocation tests included a large amount of content, including three types of lexical collocations and three types of grammatical collocations, covering both receptive and productive knowledge. This seemed to overwhelm the participants and may have affected their performance. This should be considered in future studies, perhaps by conducting testing over several weeks.

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