Polysemous Phrasal Verbs: How Much Do Thai EFL High School Learners Know?

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Abstract

This study examined Thai senior high school EFL learners' receptive and productive knowledge of English polysemous phrasal verbs. The research employed the framework developed by Garnier and Schmitt (2015), which is the most widely acknowledged and functional concept of English polysemous phrasal verb knowledge. A battery of tests measuring the participants' receptive and productive knowledge of English polysemous phrasal verbs and vocabulary size were administered. The results indicated that Thai EFL high school learners had an intermediate understanding of polysemous English phrasal verbs. On the receptive knowledge test, participants scored higher than on the controlled and uncontrolled productive knowledge assessments. In addition, the results demonstrated a positive correlation between vocabulary size and receptive / productive knowledge of English polysemous phrasal verbs. The correlation analysis also revealed that a number of English polysemous phrasal verb knowledge dimensions were interrelated. This study provides empirical evidence that Thai EFL learners' knowledge of English polysemous phrasal verbs develops along a continuum from receptive to productive use. This research also suggests that polysemous phrasal verbs are multidimensional and progressive. Longitudinal experiments with varying L1 and education levels would be beneficial for future research.

Keywords: English polysemous phrasal verb acquisition, receptive English polysemous phrasal verb knowledge, productive English polysemous phrasal verb knowledge

1. Introduction

Since it plays a crucial role in language use, vocabulary has long been a concern for English learners and scholars (Nation, 2013; Schmitt, 2010). According to Read (2000, p. 14), "vocabulary is not merely a collection of linguistic units; it is also an attribute of individual language learners, in the form of vocabulary knowledge and the capacity to access that knowledge for communicative purposes". Furthermore, those with a larger vocabulary may assimilate new ideas and concepts faster than those with a limited vocabulary (Sedita, 2005). Phrasal verb (henceforth PV) is a type of formulaic sequence that "contains a verb proper and a morphologically invariable particle that functions lexically and syntactically as a unit" (Gardner & Davies, 2007; Garnier & Schmitt, 2016; Liao & Fukuya, 2004; Wood, 2010). In the field of second language (L2) acquisition, grammarians and applied linguists generally agree that phrasal verbs are an essential and advanced component of lexical knowledge in both spoken and written documents (Darwin & Gray, 1999; Gardner & Davies, 2007; Liu, 2011; Nation, 1990). Indeed, phrasal verbs are widespread and pervasive in ordinary English communication, are employed frequently by native speakers, and require fluency (Garnier & Schmitt, 2015). Low usage of PVs results in a language that sounds unnatural and nonidiomatic (Siyanova & Schmitt, 2007).

Due to their polysemic meanings and word structure, PVs are one of the most notoriously difficult aspects of the English language to acquire, despite their pervasive use (Dagut & Laufer, 1985; Demetriou, 2020; Gardner & Davies, 2007; Garnier & Schmitt, 2015; Liu, 2011; McCarthy & O'Dell, 2007; Phoemthaweesuk, 2009; Schmitt & Redwood, 2011; Sonbul, El-dakhs, & Al-otaibi, 2020; Strong & Boers, 2019; Yasuda, 2010). Previous research has shown that learners with higher proficiency levels find phrasal verbs less challenging than those with lower proficiency levels (Rumpanpetch, 2013) and generate more phrasal verbs than one-word equivalents (Boontong, 2015; Kosolsombat & Pongpairoj, 2017). Despite the fact that knowledge and acquisition of phrasal verbs are frequently insufficient and difficult for L2 learners, they are integral to English language learning and required for a broad range of communicative functions (Garnier & Schmitt, 2016).

Although numerous empirical studies on the vocabulary acquisition of EFL learners have been conducted, there is still a need for more research on phrasal verbs. Prior research has typically analyzed the receptive and productive vocabulary knowledge of L2 learners, but their knowledge of phrasal verbs has been largely ignored. In addition, little research has been conducted to date on L2 learners' comprehension of polysemous phrasal verbs (Garnier & Schmitt, 2015; Liu, 2011). Therefore, the present study produced useful information and cast light on vocabulary acquisition in the Thai EFL context. It contributed to the literature by investigating learners' receptive and productive knowledge of polysemous PVs and determining whether the extent of learners' vocabularies correlated with their receptive and productive knowledge of polysemous PVs. Understanding the levels of phrasal verb knowledge among high school learners provided a foundation for pedagogical practices and the growth of vocabulary knowledge.

1.1 Construct of English Polysemous Phrasal Verb Knowledge

Phrasal verbs, which are considered formulaic sequences, are an essential element of the English lexicon and crucial for foreign language learners' communicative competence. Phrasal verbs are a particularly difficult area of the English vocabulary (Bolinger, 1971); although they are ubiquitous in the English language, defining them is difficult (Biber, Johansson, Leech, Conrad, & Finegan, 1999; Gardner & Davies, 2007; Liu, 2011). Phrasal verbs have been defined as verb-particle combinations (Fraser, 1976), multi-word verbs (Siyanova & Schmitt, 2007), and as formulaic sequences (Garnier & Schmitt, 2016). In the Collins Cobuild Advanced Learners' Dictionary, phrasal verbs are typically described as a combination of verbs with adverbial particles and an adverb. Schmitt and Siyanova (2007) asserted that phrasal verbs function as a single lexical unit whose meaning is sometimes readily deduced from its component parts (e.g., return from a trip = return) but cannot always be predicted (e.g., brush up on your French = revise).

This present study employed Gardner and Davies' (2007) definition of PVs because it is both objective and functional. They defined phrasal verbs as "any two-part verb consisting of a lexical verb (LV) followed by an adverbial particle" (p. 341). This definition was subsequently used by Garnier and Schmitt (2015) to create the PHaVE frequency list, which was also used in this study to select the target phrasal verbs.

Phrasal verbs with multiple meanings are polysemous. According to Gardner and Davies (2007), each of the top 100 phrasal verbs on their frequency list has between five and six meanings or senses. Similarly, Garnier and Schmitt (2015) determined that phrasal verbs have an average of 1.9 meaning senses. Phrasal verbs, in addition to their polysemy, span the idiomatic spectrum; they can be literal, aspectual, or idiomatic. Consider the idiomatic expression "work out" (Gardner & Davies, 2007):

1) work out (come up with) "His colleagues worked out his interesting idea",

2) work out (work out in detail) "elaborate a plan",

3) work out (do physical exercise) "Every day, she works out in the gym", and

4) work out (be calculated) "The fees work out to less than $1,000"

Phrasal verbs are frequently used in both informal and formal communication and are essential in both contexts. Native English speakers spontaneously comprehend and communicate effectively in spoken discourse and informal writing (Cornell, 1985). Due to the dynamic nature of phrasal verbs in English and the difficulty associated with comprehending their use, EFL learners should be taught how to communicate effectively in English through the use of phrasal verbs. Due to their high productivity, phrasal verbs are difficult for EFL learners to produce and comprehend (Bolinger, 1971), as combinations of common verbs and particles appear to be used to generate new items at random (Celce-Murcia & Larsen-Freeman, 1999). Cornell (1985) also demonstrated that at least 700 phrasal verbs are used in everyday English conversation. Therefore, learners of EFLfrequently encounter new phrasal verbs.

1.2 Previous Related Studies on English Phrasal Verbs

Utilizing phrasal verbs increases English proficiency and the ability to communicate in the English language with the fluency of a native speaker. Learners of English as a Second Language (ESL) and English as a Foreign Language (EFL) frequently lack an understanding of the semantic properties of phrasal verbs and the ability to use them appropriately in communication. Teachers also avoid phrasal verbs because they are challenging to define and little research has been conducted on commonly used phrasal verbs (Darwin & Gray, 1999). Learners frequently grapple with the meaning of complex phrasal verbs because this meaning is unrelated to the usual meaning of the constituent words (Blau, Gonzales, & Green, 1983). Indeed, the meaning of idiomatic phrasal verbs such as *catch up*, which refers to conversing with someone you have not seen in a long time, and *chew out*, which refers to harshly disparaging someone, is difficult to comprehend (Schmitt & Siyanova, 2007;

Celce-Murcia & Larsen-Freeman, 1999).

Schmitt and Redwood (2011) examined the relationship between L2 learners' receptive and productive knowledge of highly frequent phrasal verbs in English and frequency, exposure, and individual differences variables. Taking into account their intermediate level of English, the results indicated that the participants had good receptive knowledge (65.2%) and adequate productive knowledge (48.2%) of the target phrasal verbs. In addition, it was demonstrated that phrasal verb knowledge appeared to be associated with overall language proficiency, as their upper-intermediate participants scored higher than their intermediate participants. Similarly, Kamarudin, Majid, Zamin, and Daud (2019) investigated the receptive and productive knowledge of PVs among Malaysian learners, as well as the factors that may contribute to their difficulties in comprehending and employing this linguistic feature. The test results indicated that Malaysian learners possessed an average level of knowledge regarding PV knowledge and that the production of PVs was fraught with difficulty. However, the majority of phrasal verbs used in this study had only one sense, thus defeating the purpose of the study. According to Gardner and Davies (2007), each of the top 100 phrasal verbs on their frequency list has between five and six meanings on average.

A recent series of studies investigated the acquisition of receptive and productive knowledge of polysemous phrasal verbs in an effort to better understand the functions of this knowledge (Demetriou, 2020; Garnier & Schmitt, 2016; Kamarudin et al., 2019; Sonbul et al., 2020; Zhang & Wen, 2019). Garnier and Schmitt (2016) analyzed the knowledge of 128 Chilean English learners regarding exceedingly common polysemous phrasal verbs. The results indicated that, on average, only 40 percent of phrasal verb meaning senses were known, with the probability of knowing all meaning senses of each tested phrasal verb hovering around 20 percent. Later, Zhang and Wen (2019) examined the receptive knowledge of Chinese learners at the intermediate and advanced levels regarding polysemous English PVs. Participants evaluated the acceptability of 100 senses of 50 PHaVE-listed PV (Garnier & Schmitt, 2015). Both intermediate and advanced learners had an average understanding of polysemous PVs and favored higher-frequency senses over lower-frequency ones. Sonbul, El-dakhs, and Al-otaibi (2020) also examined the receptive and productive knowledge of polysemous phrasal verbs among EFL high school learners. The results demonstrated that participants had adequate receptive and productive knowledge of the target polysemous phrasal verbs. Demetriou (2020) investigated the productive and receptive knowledge of 100 high school English language learners regarding a sample of high-frequency phrasal verbs. Form-recall and form-recognition levels of proficiency were evaluated for each participant. The findings indicated that the participants had a limited grasp of phrasal verbs.

In the Thai context, only a handful of studies have examined PV knowledge among learners of varying proficiency levels (Chodchoi, 2018; Paugtes, 2020; Rumpanpetch, 2013). Chodchoi (2018) investigated the comprehension of each variety of English phrasal verbs among 11th-grade Thai learners enrolled in an English program and a regular program. Sixty high school learners participated, 30 from an English program and 30 from a regular program. The learners' comprehension of phrasal verbs was evaluated using a multiple-choice test, a matching test, and a gap-filling test. All three tests revealed that English program participants comprehended literal phrasal verbs the best, followed by aspectual and idiomatic ones. Similarly, regular program participants comprehended literal phrasal verbs the best on Test 1 and Test 2, followed by aspectual and idiomatic phrasal verbs. In Test 3, they demonstrated the greatest comprehension of aspectual phrasal verbs, followed by literal and idiomatic phrasal verbs. In addition, there was a significant difference between the two groups in terms of phrasal verb comprehension. It was proposed that future research investigate the distinction between how these phrasal verbs are interpreted. Finally, Paugtes (2020) investigated how bilingual and mini-bilingual learners at a bilingual school in Thailand use phrasal verbs and the types of phrasal verbs. The participants included 52 learners in a bilingual program for the 12th grade and 63 learners in a mini-bilingual program for the 6th grade. A phrasal verb evaluation containing 40 phrasal verbs and matching, gap-filling, and multiple-choice questions was administered to participants. The findings indicated that the proficiency level of the learners did not significantly influence their use of phrasal verbs. Rather than relying on learners' school English test scores, it has been suggested that future research should employ multifaceted assessment and conduct a proficiency level test.

Overall, while some previous studies have demonstrated a positive relationship between language proficiency and the capacity to acquire new vocabulary (e.g., Chodchoi, 2018; Rumpanpetch, 2013) such that those with higher proficiency levels acquire more phrasal verbs than those with lower or intermediate proficiency levels, other studies have not demonstrated this finding (e.g., Paugtes, 2020). Moreover, these earlier studies cannot be directly compared because distinct measures were employed. (e.g., receptive versus productive knowledge). The use of both receptive and productive task measures may be advantageous (Jeensuk & Sukying, 2021; Read, 2000;

Sukying & Nontasee, 2022), as it has been demonstrated that L2 learners' use of PVs varies across distinct testing tasks (Liao & Fukuya, 2004).

In addition, several studies have compared the preference of language learners for phrasal verbs and their one-word equivalents, resulting in the avoidance of phrasal verbs (Boontong, 2015; Kosolsombat & Pongpairoj, 2017). For instance, Boontong (2015) investigated Thai learners' preferences regarding English phrasal verbs compared to their single-verb equivalents, as well as whether learners' proficiency levels influenced their choices. Thirty Thai learners with varying levels of proficiency conducted an acceptability evaluation task. The data revealed distinct patterns depending on the proficiency of the subjects. Beginners and intermediate learners preferred phrasal verbs over single verbs, whereas more advanced learners preferred both varieties equally. Kosolsombat and Pongpairoj (2017) also investigated the avoidance behavior of L1 Thai learners with regard to English phrasal verbs. 52 undergraduate learners with an intermediate proficiency level composed the group. Results indicated that L1 Thai participants preferred single-word verbs over phrasal verbs, most likely due to the absence of phrasal verbs in Thai. The avoidance behavior was also more pronounced due to the semantic complexity of figurative phrasal verbs.

For the following reasons, language learners are prone to avoid phrasal verbs in favor of single-word verbs: 1) the majority of phrasal verbs in nature are polysemic and have multiple meanings; 2) due to their unnatural sound and meaning distinctions, phrasal verbs cannot always be replaced with their single-word equivalents. This makes them essential to English language instruction and necessary for a vast array of communicative functions that must be taken into account (Garnier, 2016). Indeed, learners must understand phrasal verbs to use a language naturally and appropriately in context (Gardner & Davies, 2007; Garnier & Schmitt, 2015; Celce-Murcia & Larsen-Freeman, 1999). Additionally, the use of phrasal verbs can enhance a learner's fluency and native-like selection, as well as reduce cognitive effort by reducing the time spent processing a word and making it instantly accessible in their minds. In addition, the use of phrasal verbs can help native speakers comprehend the learners more effectively.

While knowledge and acquisition of phrasal verbs are frequently insufficient and difficult for EFL learners, they are integral to the English language learning process and require consideration of a wide range of communicative functions (Garnier, 2016). In the Thai EFL context, however, previous studies have assessed phrasal verb knowledge using a variety of measures, and these studies have frequently focused on the single-meaning sense of phrasal verbs. Moreover, these studies have not examined the relationship between the proficiency level of learners and their knowledge of phrasal verbs. In order to address this deficiency, the present study examined the receptive and productive knowledge of polysemous PVs among learners. This study's specific objective was to test the hypothesis that learners' knowledge of polysemous phrasal verbs increases as their vocabulary expands. The study evaluated the receptive and productive knowledge of English polysemous phrasal verbs among high school learners and addressed the following research questions:

1) What is the level of receptive and productive knowledge of English polysemous phrasal verbs in Thai high school EFL learners?

2) What is the relationship between Thai EFL high school learners' vocabulary size and receptive/productive knowledge of English polysemous phrasal verbs?

2. Method

2.1 Participants and Setting

The participants were 286 high school learners in grades ten through twelve. All of the participants in this study attended the researcher's school, so convenience sampling was employed to select them. Participants in these grades were selected because they had studied English for over ten years and possessed diverse levels of proficiency. When the data were collected, their ages ranged from 16 to 18. None of the participants had studied English in a country with a majority English-speaking population. The participants received an average of four hours of English instruction per week, broken down into five sessions of fifty minutes each. According to the Office of the Basic Education Commission, all participants had been enrolled in EFL classes as a required subject for at least ten years (Ministry of Education in Thailand). Moreover, despite having access to English-language media such as the internet, news articles, films, radio, and television, they may have used them sparingly due to their incapacity to comprehend them independently. Consequently, it was presumed that Thai learners' exposure to the English language was restricted to classroom instruction. The purpose of the study was communicated to the participants in advance, with the data remaining anonymous.

2.2 Measures

The current study used four research instruments. The Vocabulary Size Test (VST) was used to assess participants' receptive knowledge of vocabulary sizes. Three different tests were used to assess learners' receptive and productive polysemous phrasal verb knowledge, including the Receptive Polysemous Phrasal Verbs Test (RPT), the Controlled Productive Polysemous Phrasal Verbs Test (CPPT), and the Productive Polysemous Phrasal Verbs Test (PPT). Sixty-one participants were asked to pilot the tests, and a test of reliability verified the acceptance of the internal consistency reliability estimates for the three test formats (all Cronbach's α values ≥ 0.78; DeVellis, 2003; Dörnyei, 2007; Mackey & Gass, 2005) and the content validity was validated by five experts (All items > 0.5). All items scored between 0.2 and 0.8 on the item difficulty scale and between 0.2 and 1 on the item discrimination scale (Creswell, 2002; Fraenkel & Norman, 2003).

2.2.1 Vocabulary Size Test

The present study utilized the Vocabulary Size Test (VST) developed by Nation and Beglar (2007), which consisted of 50 items with four answer choices per item (Nation, 2015). The Vocabulary Size Test (VST) was used to evaluate the participants' receptive vocabulary size knowledge. Participants were required to choose the optimal definition of the tested term from four alternatives. No points were awarded for non-responses or erroneous responses, while one point was awarded for each correct response. The individual's overall receptive vocabulary size was approximated by multiplying their total score by 100. Below is a sample question from the VST (Nation & Beglar, 2007, p. 75):

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1. poor: we are poor.

    a. have no money

    b. feel happy

    c. are very interested

    d. do not like to work hard

2.2.2 Receptive Knowledge of English Polysemous Phrasal Verb Tests (RPT)

The RPT was created and modified based on the multiple-choice format test (Sonbul et al., 2020) in order to assess the learners' receptive knowledge of PVs. The original 100-item examination contained 37 items with multiple meanings. The samples were chosen at random from the PHaVE List (Garnier & Schmitt, 2015). The distractors were also selected from the PHaVE list of non-target PVs that did not suit the sentence context. To assure the validity of the test, it was piloted with three rounds of natives. In the final round, all items received a flawless score of 100 percent from six native English speakers.

In the present study, twenty polysemous PVs with fifty distinct meanings were employed (Sonbul et al., 2020). After comparing 37 polysemous PVs to the vocabulary lists of the National Institute of Educational Testing Service (NIETS) and testing to determine the level of familiarity with the target words in the context of the research (Wesche & Paribakht, 1996), it was determined that 17 polysemous PVs were not appropriate for this research. The 'I do not know' option was removed from Sonbul et al.'s (2020) test because it encouraged respondents to avoid pondering and committing. (Oppenheim, 1992). In addition, the sentence contexts were modified to distinguish them from Garnier and Schmitt's Controlled-Productive Polysemous Phrasal Verbs Test (CPPT). The final receptive polysemous PVs test was a 50-item test comprised of 20 polysemous PVs with 50 distinct meaning senses. Participants were required to read the sentence and select the most appropriate response (30 minutes). A correct response received a score of 1, while an incorrect response received a score of 0. The RPT sample is shown below.

1) We could fit more people on the bus if everybody ____ ____ a bit. (change position to make more space)

a. broke up   b. looked up   c. turned up   d. moved up

2) Mike needs a lift from the station. Can you go and ____ him ___? (collect, give a lift)

a. pick out   b. pick up   c. pick at   d. pick on

2.2.3 Controlled-Productive Knowledge of English Polysemous Phrasal Verb Tests (CPPT)

Based on the Productive Phrasal Verb test, the CPPT was modified (Garnier & Schmitt, 2016). The original version of the examination contained one hundred gap-fill questions with a defining context (see Garnier &

Schmitt, 2016 for the full version of the test). Based on extensive pilot testing with native speakers, the first letter (or letters) of each word and its meaning were used to limit the responses. In addition, minor adjustments were made to better suit the research context. This controlled productive test of polysemous PVs targets 20 polysemous PVs with 50 distinct meanings. The test employs different sentence contexts from the receptive test to prevent participants from establishing a correlation between words on the receptive and productive tests (Laufer & Goldstein, 2004). The final examination included 50 gap-fill questions, including 20 polysemous PVs with 50 distinct meanings (40 minutes). The assignment evaluated the ability to recall and generate polysemous PVs in response to a prompt. On the exam, a prompt for response and sentence completion was provided. Examples are given below:

1) The prisoners are hoping to **g___o___** of jail soon. (leave)

2) I did not think he would **b___u___**the subject. (mention, introduce)

2.2.4 Productive Knowledge of English Polysemous Phrasal Verb Tests (PPT)

The PPT was created based on the LPAK task format (Sukying, 2018). The purpose of the evaluation was to evaluate the participants' ability to recall and generate polysemous PVs. Each item has two components. (Xa and Xb). Part Xa defines the meaning of the target PVs, followed by a vacant line where the phrasal verb should be entered. In part Xb, participants must compose the sentence using the phrasal verb provided in part Xa. Below is supplied a sample inquiry:

1) a) Move upward, or from a lower spatial location to a higher one   **g___u___**

   b) _____.

The PPT consists of 20 items, including 20 polysemous PVs with 20 distinct meanings (30 minutes), chosen from a pool of 50 meanings. Because the PPT was a free-writing assignment that required more time to complete, only 20 definitions were chosen. Moreover, writing 50 unique sentences can fatigue and bore participants during data collection. In section Xa, a correct PV is worth one point, while an erroneous response is worth zero points. An experienced native speaker who teaches English as a foreign language in Thailand evaluated the participant's written section Xb sentences. Assuming that participants had a limited comprehension of PVs, minor misspellings were disregarded, and no points were deducted for incorrect constructions.

2.3 Data Collection Procedure

After obtaining permission from high school, the research was presented to the participants as regular classwork. It was administered over the course of two days during separate class sessions. Before assessing polysemous phrasal verb knowledge on the first day of data collection, the Vocabulary Size Test (VST) was administered to measure participants' overall receptive vocabulary size knowledge, followed by the Productive Polysemous Phrasal Verb Test (PPT). The Controlled-Productive Polysemous Phrasal Verb Test (CPPT) was administered on the second day, followed by the Receptive Polysemous Phrasal Verb Test (RPT). Before administering the examinations, the participants were apprised of the overall purpose of the present study and informed that their performance on the examinations would not affect the outcome of the course.

To prevent confusion, test instructions were provided to participants in their native Thai. The productive tests were administered first to prevent participants from associating words from the receptive test with their spelling on the productive test (Laufer & Goldstein, 2004). In other words, the two categories of productive polysemous phrasal verb knowledge tests were administered before the receptive test. Therefore, the four exams were administered as follows: 1) VST followed by 2) PPT, 3) CPPT, and 4) RPT. Participants were required to complete the four exams independently, without the use of dictionaries or discussions with classmates. Participants who left all queries unanswered were excluded from the analysis. Those who provided the same ten answers consecutively to different queries were also disqualified.

2.4 Data Analysis

Four examination results were statistically analyzed. First, descriptive statistics were used to report the results, followed by an ANOVA analysis to compare all experiments. A paired-samples t-test was also used to determine whether there was a statistically significant difference between the scores on the various assessments, both receptively and productively. Additionally, a correlation analysis was used to examine the relationship between performance on the four tests. In addition, effect sizes were calculated.

3. Results

As shown in Table 1, the participants' aggregate score on their knowledge of English polysemous phrasal verbs was 69.74%. (Three tests mean percentage: RPT, CPPT, PPT). They performed best on the receptive knowledge

test of English polysemous phrasal verbs (RPT; 74.02%), then on the controlled-productive knowledge test (CPPT; 71.02%), and lastly on the free productive knowledge test (PPT; 64.02%). In addition, participants scored 51.56% on the VST.

Table 1. Descriptive statistics ($N = 286$)

English polysemous phrasal verbs	Tests	Mean	SD	Skewness	Kurtosis	Total (%)
Receptive knowledge	RPT	37.01	13.43	-0.43	-0.51	74.02
Control productive knowledge	CPPT	35.51	12.80	-0.22	-0.83	71.02
Productive knowledge	PPT	25.67	12.05	0.11	-0.51	64.18
Vocabulary size	VST	25.78	4.79	0.12	-0.52	51.56

ANOVA was performed to determine whether the test scores were significantly different. As shown in Table 2, scores on the four tests (RPT, CPPT, PPT, and VST) differed substantially, with a large effect size ($F = 744.705$, $p < 0.001$, $\eta2 = 0.42$). There was a statistically significant difference between scores on the three different tests of English polysemous phrasal verb knowledge (RPT, CPPT, and PPT) with a large effect size ($F = 207.755$, $p < 0.001$, $\eta^2 = 0.72$).

Table 2. The ANOVA results

Knowledge	Tests	F-test	(η^2)
Polysemous phrasal verb	RPT, CPPT, PPT	207.755**	0.72
Polysemous phrasal verb + Vocabulary size	RPT, CPPT, PPT, VST	744.705**	0.42

Note. **$p < 0.001$, $N = 286$ (2-tailed).

In addition, a paired-samples t-test revealed that test scores varied (RPT versus CPPT: $t = 5.45$, $p < 0.001$, $d = 0.11$; RPT versus PPT; $t = 32.32$, $p < 0.001$, $d = 0.89$; CPPT versus PPT; $t = 30.06$, $p < 0.001$, $d = 0.79$). Overall, these results indicate that the participants had different degrees of reception, controlled production, and free production of English polysemous phrasal verb knowledge.

Table 3. Comparisons between scores on different tests of English polysemous phrasal verb knowledge

English polysemous phrasal verbs	Tests	t-value	Effect-size (d)
Receptive knowledge	RPT	5.45**	0.11
Controlled-productive knowledge	CPPT		
Receptive knowledge	RPT	32.32**	0.89
Productive knowledge	PPT		
Controlled-productive knowledge	CPPT	30.06**	0.79
Productive knowledge	PPT		

Note. **$p < 0.001$, $N = 286$ (2-tailed).

A correlation analysis was conducted to examine the relationships between English polysemous phrasal verb knowledge tests (RPT, CPPT, and PPT) and vocabulary size tests (VST). Effect sizes were also calculated (R^2). As shown in Table 4, pearson correlation coefficients revealed no significant correlations between vocabulary size (VST) and English polysemous phrasal verb knowledge (RPT, CPPT, and PPT; all r values ≤ 0.09, $R2 \leq 0.01$). However, the three different tests of English polysemous phrasal verb knowledge (RPT, CPPT, and PPT) were positively correlated with large effect sizes (all r values ≥ 0.90; $p < 0.001$; all $R2$ values ≥ 0.81).

Table 4. Correlation between scores on vocabulary size and polysemous phrasal verb knowledge

Tests	RPT	CPPT	PPT	VST
RPT	1			
CPPT	0.94**	1		
PPT	0.90**	0.90**	1	
VST	0.07	0.09	0.08	1

Note. **$p < 0.001$, $N = 286$ (2-tailed).

4. Discussion

Using a battery of multiple tests, this study investigated the receptive and productive knowledge of English polysemous phrasal verbs among Thai high school learners. The results indicated that aspects of English polysemous phrasal verb knowledge were correlated but not concurrently known, indicating that PV knowledge is acquired in stages.

The three measures of polysemous phrasal verbs used in this study revealed varying levels of phrasal verb knowledge. Participants performed the best on the receptive knowledge test, followed by the controlled productive knowledge test and the productive knowledge test. The RPT assesses the participants' ability to distinguish the form and meaning of a phrasal verb and to comprehend its meaning in isolated sentences. In contrast, the CPPT measures a participant's capacity to recall and generate polysemous phrasal verbs when prompted by sentences. Similarly, the PPT assesses the participants' ability to draw on various types of knowledge, including cognitive and metacognitive strategies, to relate the meaning and form of the target phrasal verbs in contexts with few cues.

This study's observed pattern of results could be explained by the levels of learning in L2 contexts (Laufer & Goldstein, 2004). The RPT imposed a significantly lower cognitive processing demand on Thai learners than the CPPT, which imposed a lower cognitive processing demand than the PPT. The difference between the RPT and PPT scores may indicate that the CPPT test functions as a steppingstone, enabling learners to acquire and develop phrasal verb knowledge. In other words, receptive phrasal verb knowledge serves as the basis for productive phrasal verb knowledge. These results also indicate that receptive phrasal verb knowledge is acquired at an early stage where it may not be completely mastered. In other words, productive knowledge of phrasal verbs cannot be mastered until receptive knowledge is mastered. These results are consistent with prior research demonstrating that receptive knowledge of English polysemous phrasal verbs is acquired before productive knowledge (Chodchoi, 2018; Demetriou, 2020; Gardner & Davies, 2007; Garnier & Schmitt, 2016; Kamarudin et al., 2019; Paugtes, 2020; Rumpanpetch, 2013; Sonbul et al., 2020; Zhang & Wen, 2019). In the vocabulary literature, it has also been reported that receptive knowledge is first acquired and then transferred to productive knowledge (Jeensuk & Sukying, 2021; Laufer & Goldstein, 2004; Nation, 2013; Sukying & Nontasee, 2022; Zhang & Sukying, 2021). Overall, the results indicate that students possessed adequate receptive and productive knowledge of the target polysemous phrasal verbs.

The correlational analysis revealed no significant relationship between learners' knowledge of English polysemous phrasal verbs and their knowledge of vocabulary size. However, significant positive correlations were found between scores on the tests of English polysemous phrasal verbs for reception and production. Importantly, the participants' vocabulary size knowledge was inadequate to support and develop their English polysemous phrasal verb knowledge (Laufer & Goldstein, 2004; Sukying, 2018) and phrasal verbs knowledge (Demetrios, 2020; Laufer & Goldstein, 2004; Sonbul et al., 2020). Indeed, Schmitt and Redwood (2011) found a correlation between phrasal verb knowledge and overall language proficiency, as well as a positive correlation between proficiency and vocabulary acquisition capacity. Higher proficiency levels are associated with greater phrasal verb acquisition (Chodchoi, 2018; Rumpanpetch, 2013). In contrast, Paugtes (2020) found no statistically significant difference in phrasal verb scores between learners with higher and lower levels of proficiency. To examine the contribution of vocabulary size to English polysemous phrasal verb knowledge and to other aspects of English that may influence English polysemous phrasal verb knowledge, it may be necessary to use different contexts and methods.

5. Conclusion

The current study revealed that Thai high school learners had an intermediate level of proficiency with polysemous phrasal verbs. The findings also revealed the continuum of varying levels of phrasal verb knowledge. In particular, it was demonstrated that receptive knowledge of English polysemous phrasal verbs preceded productive knowledge. In addition, the correlation analysis revealed that various dimensions of English polysemous phrasal verb knowledge are highly and closely interrelated. The present findings indicate that acquiring English polysemous phrasal verbs is an incremental process continuum and suggest that knowing English vocabulary likely contributes to the acquisition of English polysemous phrasal verb knowledge. This study provides empirical evidence regarding the English polysemous phrasal verb knowledge acquisition of Thai EFL learners by proposing the natural construct of English polysemous phrasal verb knowledge in Thailand and the vocabulary facilitations to enhance it.

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Appendix A

The Receptive of Polysemous Phrasal verbs Test (RPT)

Instructions: Read each sentence carefully, and then choose the phrasal verb that best completes the meaning of the sentence. To help you, a definition for each phrasal verb is given after every sentence. **Please make sure you read each definition carefully.** There are 50 sentences and some of them use the same phrasal verb. You have 30 minutes to finish the test. Good luck!

Examples:

1. Our water supply has been ____ ____. (ended the provision of)

    A. went off

    B. winded up

    C. cut off

    D. hung up

2. Do you think that mixed-ability classes ____ ____ the better students? (limit potential)

    A. close down

    B. give back

    C. hold back

    D. move back

3. Our tank and infantry forces ____ ____ to regroup. (withdrew)

    A. went out

    B. pulled back

    C. looked around

    D. went in

4. She resigned and ____ ____ to one of her younger colleagues. (surrendered, yielded)

    A. handed over

    B. went off

    C. pulled up

    D. winded up

5. He ____ ____ a cheque for $200,000. (gives, presents)

    A. takes over

    B. hands over

    C. carries out

    D. pulls out

Appendix B

Controlled-Productive Polysemous Phrasal Verbs Test (CPPT)

Instructions: Read each sentence carefully, and then write what you think the missing words (a phrasal verb) are, in the space next to the sentence. To help you, the first letter(s) of each word is/are shown. A definition for each phrasal verb is also given after every sentence. **Please make sure you read each definition carefully**. There are 50 sentences and some of them use the same phrasal verb. You have 40 minutes to finish the test. Good luck!

Examples:

Item	Sentence	Answer
1	Put the chicken on the grill and t___ it o___ a few times. (***bring the bottom to the top or vice versa***)	
2	Their new album will c___ o___ next month. (***be released to the public***)	
3	She h___ b___ the laughter with great effort. (***contained, repressed***)	
4	They p___ u___ a few posters on the wall. (***displayed, attached***)	
5	After hitting the iceberg, the ship began to g___ d___. (***sink***)	

Appendix C

Productive Polysemous Phrasal Verbs Test (PPT)

Instructions: Each item contains two parts (Xa and Xb). Part Xa presents the meaning sense definition of target PVs, followed by a blank space next to the sentence for writing the phrasal verb word you identify as the missing word (a phrasal verb). To help you, the first letter(s) of each word is/are shown. In part Xb, you are required to write the sentence using the phrasal verb that you provide in part Xa. **Please make sure you read each definition carefully**. There are 20 items in this test. You have 30 minutes to finish the test. Good luck!

Examples:

item	Meaning sense definition	Answer
1a	Interrupt somebody as they are speaking	
1b		
2a	Rest in a comfortable position against the back of a seat	
2b		
3a	Invite to a recreational place or social event	
3b		
4a	Use STH (or become used) completely so that nothing is left	
4b		
5a	Collapse, fail; stop functioning properly (heart, knees)	
5b		

Note. For further information regarding the tests, please contact Natthamon Chansongkhro atnattamon.cha@patum.ac.th