Thai Learners' Morphological Awareness of English Complex Words and its Effects on Vocabulary-in-Context Usage

การตระหนักรู้เรื่องหน่วยคำของคำผสานในภาษาอังกฤษของผู้เรียนชาวไทย และผลของการตระหนักรู้ที่มีต่อการเลือกใช้คำศัพท์ในบริบทต่าง ๆ

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Abstract

This research aimed to examine fifty-three Thai learners' morphological awareness (or MA) of English complex words and to investigate its effects on vocabulary-in-context usage. Four multiple-choice tests were constructed with complex words containing two to five morphemes and free and bound roots and with affixes governed by the selectiveness of derivation constraint. It was found that the increased number of constituent morphemes and the bound roots did not affect the MA. No correlation was found between the awareness of morphemic structures and meanings. The selectiveness constraint was satisfied in some affixes only. Only the awareness of morphemic meanings extended a significant contribution to vocabulary-in-context usage. L1 transfer was not attested, but irregularity of inflection and polysemy of affixes provided a more effective account for Thai learners' morphological awareness.
Keywords: Morphological Awareness, Complex Words, Vocabulary-in-Context Usage

บทคัดย่อ

งานวิจัยนี้ศึกษาการตระหนักรู้เรื่องหน่วยคำของคำผสานในภาษาอังกฤษของผู้เรียนชาวไทยจำนวน 53 คน และผลของการตระหนักรู้ดังกล่าวต่อการใช้คำศัพท์ในบริบท แบบทดสอบปรนัยมี 4 ฉบับ โดยมีคำผสานที่มีหน่วยคำสองถึงห้าหน่วยและมีทั้งรากศัพท์อิสระและไม่อิสระ รวมทั้งอุปสรรค (prefix) และปัจจัย (suffix) ที่เลือกประเภทของคำบางชนิดในการเชื่อมต่อกับรากศัพท์ พบว่าการเพิ่มจำนวนหน่วยคำและรากศัพท์ชนิดไม่อิสระไม่มีผลกระทบต่อระดับการตระหนักรู้เรื่องหน่วยคำ ไม่พบความสัมพันธ์ระหว่างการตระหนักรู้ด้านโครงสร้างและความหมายของหน่วยคำ การตระหนักรู้เรื่องข้อบังคับการเลือกใช้ชนิดของคำพบในอุปสรรคและปัจจัยบางตัวเท่านั้น และเฉพาะการตระหนักรู้เรื่องความหมายของหน่วยคำมีผลดีต่อการใช้คำศัพท์ในบริบท ไม่พบอิทธิพลของภาษาที่หนึ่ง แต่พบผลกระทบของรูปที่ไม่ปกติของปัจจัยและความกำกวมของอุปสรรคและปัจจัย ที่มีต่อการตระหนักรู้เรื่องหน่วยคำ
คำสำคัญ: การตระหนักรู้เรื่องหน่วยคำ คำผสาน การใช้คำศัพท์ในบริบท

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Introduction

Complex words are made up of at least two morphemes, and at least one of them must be bound (i.e., dependent) such as “un-happy, en-light-en-s, in-vis-ibil-ity,” (Carstairs-McCarthy, 2010; Iwasaki and Ingkaphirom, 2005; Lardiere, 2006; Lieber, 2010). Both English and Thai make use of complex words as a medium of communication (e.g., “อ-มนุษย์” /ʔàmanút/, “non-human,” “พิธี-กร” /pʰítʰiikɔɔn/, “master of ceremony” in Thai). Nevertheless, differences exist between them; i.e., the greater productivity of derivation, the multiple derivation per word, the selectiveness of derivation, and the use of inflection and bound roots in English (Lardiere, 2006). Karlsson (2015) reported that to gain a mastery of affixation was a “universally challenging, slow incremental” process not only to second-language (L2) learners but also even to native speakers, which was in line with Ward & Chuenjundaeng (2009)’s report on the lack of English suffixation awareness among the Engineering- and Medicine-majored Thai students. Motivated by the concept of first-language (L1) transfer in EFL morphology (e.g., Karlsson, 2015; Oz, 2014; Zhang and Koda, 2013), the findings about the contribution of morphological awareness to other language skills (Jeon, 2011; Oz, 2014; Zhang and Koda, 2013), and the findings of Ward & Chuenjundaeng (2009), the current research raised a few questions as to the Thai learners’ morphological awareness of the English derived and inflected multi-morpheme words containing free and bound roots and, also, its contribution to reading skills.

Literature Review

This section provides background information about English and Thai morphology, the definition of morphological awareness, and previous findings on English as a Foreign Language (EFL) morphology.

1. Morphology

Morphology means a study of the internal structures of words, word-formation processes, and rules and constraints which govern them (Lardiere, 2006; Oz, 2014). Words can be classified into simplex, compound, complex, and compound-complex words, depending on the types of the constituent morphemes. A **morpheme** is a smallest meaningful unit of a word, consisting of two types: a free and a bound morpheme (Carstairs-McCarthy, 2010; Fromkin, Rodman, and Hyams, 2017; Haspelmath and Sims, 2010; Iwasaki and Ingkaphirom, 2005; Lardiere, 2006; Lieber, 2010). A **free** morpheme can stand independently with meaning; whereas, a **bound** morpheme cannot. **Complex** words result from a combination of a bound morpheme with another free or bound morpheme(s) such as “dis-color-ed, un-re-li-abl(e)-y, com-pute(r)-iz(e)-ation.” Each word must contain a root, which can be free or bound, to convey a core meaning; e.g., “color, lie, -pute- of the above. In case of complex words, two morphological processes are involved:

derivation and inflection (Iwasaki and Ingkaphirom, 2005; Lardiere, 2006). Through **derivation**, an affix (a prefix, an infix, or a suffix) is added to the existing root or base to create a new meaning and, in most cases, to form a new part of speech such as "happy (adjective), happily (adverb), happiness (noun), unhappy (adjective)." Through **inflection**, an affix is added to express a grammatical meaning such as plurality, possessiveness, present tense, etc. as in "walk (verb), walked (verb, past tense or past participle), cat (noun), cats (noun, plurality)."

Two languages may make use of all the four types of words in communication; however, they may give different levels of preference to the same type of words. For example, both English and Thai have all the four kinds of words in their lexicon, but complex words in English are greater in quantity and, accordingly, higher in frequency of use than those in Thai. Lardiere (2006) mentioned that derivation is a very **productive** process in English; whereas, Iwasaki and Ingkaphirom (2005) reported that derivation is not very active in Thai, especially in the matter of suffixation, and most derivational affixes in Thai have Pali, Sanskrit, or Khmer origin. Consequently, English has a very long list of derivational affixes such as "un-, in-, pre-, post-, re-, dis-, -ment, -ness, -ive, -ity, -ation, -ful, -able, -ly, -ize, -ate, -ify, -wards, -wise, and so on. On the contrary, the list is relatively very short in Thai such as "อ-," /ʔà/, "not," "นัก-," /nák/, "a class of persons," "การ-," /kaan/, "noun-forming prefix meaning "activity," "ความ-," /kʰwaam/, "noun-forming prefix referring to an abstract concept," "-การ," /kaan/, "work," "-กร," /kɔɔn/, "doer," etc.

Apart from different degrees of productivity of derivation, English and Thai also differ in some other aspects. First, in English, more than one derivational affixes can be added in a word (also referred to as **multiple derivation**) such as "national, international, internationalize, internationalization, and so on." But, in Thai, the derivational affixes can occur only once in a word such as "อ-มนุษย์" /ʔà-manút/, "non-human," "อนุ-ชน" /ʔanú-tɕon/, "young people," "พิธี-กร" /pʰítʰii-kɔɔn/, "master of ceremony," "ธุร-การ" /tʰúrá-kaan/ "business." Due to the multiple derivation, an English word can contain more than two morphemes; whereas, most Thai counterparts contain only two morphemes. Secondly, English derivation applies "**selectiveness**," but Thai does not. This means that some English affixes select a part of speech of the base to be attached to (Lardiere, 2006, p. 75); for example, "-ly" (as an adverb-forming suffix) selects an adjective base to be attached to as in "wisely, slowly, comfortably;" while, "-ly" (as an adjective- forming suffix) selects a noun base as in "sisterly, friendly, girly." Thirdly, English, like other analytic languages, makes little use of **inflection** (e.g., plurality "-s," past tense "-ed," superlative "-est"); whereas, Thai, like other isolating languages, makes no use of inflection. Fourthly, English complex words may be built upon **bound** roots (e.g., -vis-, "see," –pute-, "think," –ject-, "throw"), which can never be found

as a word in the input; whereas, most Thai complex words are built upon free roots. This research was partly motivated by all these different aspects of Thai and English morphology with a question as to how Thai learners would manage to acquire the very complex structures of English complex words together with their constraint.

2. Morphological awareness

The term "**morphological awareness**" (hereafter, MA) means "… children's conscious awareness of the morphemic structure of words and their ability to reflect on and manipulate that structure" (Carlisle, 1995, p. 194, as cited in Oz, 2014). Following Oz (2014); Zhang and Koda (2012 and 2013), MA in this research was used to refer to the Thai learners' ability to decompose English complex words into morphemes (i.e., awareness of **morphemic structures**) and to decipher the meaning of each constituent morpheme (i.e., awareness of **morphemic meanings**). The past research on EFL morphology revolved around the learners' morphological awareness, and its findings motivated this research to examine Thai learners' MA under the scenario in which English and Thai morphology differed as earlier presented.

3. Previous findings on EFL morphology

Acquiring L1 and L2 morphology has been found a universally challenging and slow process (Dyson, 2009; Karlsson, 2015; Ward and Chuenjundaeng, 2009). The past works could be generalized into three categories; namely, (1) stages and order of morphological development (Deng, Shi, Dunlap, Bi, and Chen, 2016; Karlsson, 2015; Mochizuki and Aizawa, 2000; Pienemann, 1998 and 2005 as cited in Dyson, 2009), (2) morphological awareness and its contribution to acquisition of vocabulary, grammar, and language skills; and (3) factors affecting EFL morphological knowledge. The current research conducted its study, based on the past findings (2) and (3). See details below.

As for the relation between EFL learners' **morphological awareness** and other **language skills**, it was found that EFL learners with better awareness of morphemic boundaries, of relation between roots, bases, and stems and their inflected and derived forms, and of a variety of affixes succeeded more in vocabulary acquisition (in both its size and depth) (Akbulut, 2017; Hashemi and Aziznezhad, 2011; Masrai, 2016; Mochizuki and Aizawa, 2000; Paiman, Thai, and Yuit, 2015; Solati, 2014; Zhang and Koda, 2012; Zhang and Koda, 2013), in **reading comprehension** (Jeon, 2011; Zhang and Koda, 2013; Oz, 2014), in listening, speaking, and writing (Oz, 2014), and in grammar (Zhang and Koda, 2013). Zhang and Koda (2013) and Zhang, Koda, and Sun (2014) added that derivational and compound awareness independently influenced reading ability over

vocabulary and grammatical knowledge. And Zhang and Koda (2012) discovered that it was not "morphological awareness" but, rather, "lexical inferencing" or ability to identify only some morphemes inside a word, which had sufficient impacts on reading comprehension. In the current study, a new perspective was invested in quest of whether the awareness of "morphemic structures" and that of "morphemic meanings" independently contributed to reading skills.

In regard to the factors affecting EFL morphological acquisition, they could be further divided into two types: (1) non-linguistic factors and (2) linguistic factors. The non-linguistic factors included the learners' English language proficiency (Deng, Shi, Dunlap, Bi, and Chen, 2016; Ward and Chuenjundaeng, 2009; Zhang and Widyastuti, 2010), learning settings (Zhang and Widyastuti, 2010), morpheme teaching treatments (Akbulut, 2017; Deng, Shi, Dunlap, Bi, and Chen, 2016; Flanigan, Templeton, and Hayes, 2012; Mochizuki and Aizawa, 2000; Paiman, Thai, and Yuit, 2015; Tahaineh, 2012). On the other hand, the linguistic factors included L1-L2 morphological similarities and differences and their transfer, frequency of L2 input, and nature of morphological complexity of the English complex words. Since this research did not focus on the non-linguistic factors, their findings were excluded from the review below.

In case of **L1 transfer**, it was reported that acquisition of L2 morphology was potentially **facilitated** if L1 and L2 belonged to the same morphological typology (Zhang and Koda, 2013), belonged to the same language family (e.g., English-Swedish in Karlsson, 2015), shared similar cognates (Oz, 2014), or applied more or less an equal degree of productivity of morphological processes (e.g., a transfer of productive compounding process in Chinese into English in Li, 2017; Zhang, Koda, and Sun, 2014). On the other hand, the acquisition of L2 morphology was **slow** if the L2 morphological processes were different from those in L1 as in Deng, Shi, Dunlap, Bi, and Chen (2016), which reported that a lack of inflectional morphology and limited derivational morphology in L1 Chinese accounted for why the early stage of EFL morphological development showed failure to acquire the two processes. Meanwhile, if L1 contained more complex internal structures of words, it was likely that L2 morphological learning would become more successful (e.g., a strong effect of L1 transparent or agglutinative morphology on EFL morphology reported by Marinova-Todd et al., 2013 as cited in Kraut, 2015). In this research, L1 transfer in EFL morphology was used as a conceptual framework for setting the goals of study and for designing the instrument.

Apart from L1 transfer, some other factors were proposed. For instance, **frequency of L2 input** helped explain why some affixes were acquired sooner than others (Karlsson, 2015;

Mochizuki and Aizawa, 2000; Ward and Chuenjundaeng, 2009; Zhang and Koda, 2013). For instance, the Japanese learners acquired the more common prefixes "re-, un-, pre-" before "semi-, ex-, en-" and then "counter-, in-, and ante-" and acquired the more frequent suffixes "-ation, -ful, -ment" before "-ness, -ism, -able" and then "-ish, -y, -ity (Mochizuki and Aizawa, 2000). Next, **irregular inflection** such as "knew, alumni, (two) salmon" could also hinder EFL morphological development, leading to confusing decomposition (Karlsson, 2015; Masrai, 2016). **Polysemy of affixes**, or one form of an affix with double meanings or usage, was another morphological challenge as in the Japanese EFL learners' confusion of "in-" (not) and "in-" (inside) mentioned in Mochizuki and Aizawa (2000). Finally, English contains the **selectiveness** of derivation constraint as earlier stated, but it was found that the EFL learners were not aware of it and tended to produce wrong affixation as in "*stateness" instead of "statement" produced by Swedish learners in Karlsson (2015). In this research, all these four factors could be helpful in accounting for the MA among Thai learners, especially when L1 transfer failed to provide a comprehensive explanation.

Motivation

Based on the literature review, several aspects called for further investigation. First, research on Thai learners' EFL morphology was extremely **scarce**. In fact, only Ward and Chuenjundaeng (2009) was found, unless otherwise assumed a few more, leaving several issues to be investigated such as awareness of prefixes, roots, internal complexity, selectiveness of derivation, etc. Secondly, as earlier mentioned, English and Thai **differed** in the matter of productivity of derivation, multiple derivation, selectiveness of derivation, inflection, and bound roots, a question was raised as to whether all these differences would affect the Thai learners' EFL morphology. Thirdly, **none** of the previous researches examined the interplay between the awareness of morphemic structures (i.e., the ability to decompose words into morphemes) and the awareness of morphemic meanings (i.e., the ability to decipher meanings of constituent morphemes) and how each would affect a reading task. So, this research made the first attempt. With these three motivations, the current study was carried out.

Conceptual framework

Following Ellis (2002); Gass and Selinker (1994); Saville-Troike (2004), "**language transfer**" refers to "application of certain linguistic features of one language in the production and comprehension of another language," and the transfer include that from L1 to L2, from L2 to L1, from the previously acquired features to the later acquired ones, etc. Motivated by the previous findings and suggestions of L1 transfer in EFL morphological development (Deng, Shi, Dunlap, Bi, and Chen, 2016; Karlsson, 2015; Li, 2017; Oz, 2014; Zhang and Koda, 2013; Zhang, Koda,

and Sun, 2014), L1 transfer was used as a conceptual framework for the goals, the research questions, and the instrument design. It was hypothesized that Thai learners would carry over derivation mechanism they had been exposed to in L1 into the decomposition task of EFL complex words. However, multiple derivation and the use of inflection, bound roots, and the selectiveness constraint could interfere in the acquisition. The **hypotheses** were (1) the more morphemes the word contained; the higher the chances were the learners would fail in the decomposition and deciphering tasks; (2) the decomposition and deciphering of words with bound roots were likely to fail more than that of words with free roots.

Objectives

Based on the motivations and the conceptual framework stated above, this research set the following two objectives:

1. to examine Thai learners' morphological awareness of English complex words
2. to investigate the relation between the morphological awareness and vocabulary-in-context usage.

Research Questions

Based on the objectives stated above, five specific questions were raised as follow.

For objective (1):

1. To what extent were Thai learners aware of the morphemic structures of English complex words?
2. To what extent were Thai learners aware of the morphemic meanings of English complex words?
3. Was there a correlation between the awareness of the morphemic structures and the awareness of the morphemic meanings?
4. To what extent were the learners aware of the selectiveness of derivation constraint?

For objective (2):

5. Was there a correlation among the awareness of the morphemic structures, the awareness of the morphemic meanings, and the vocabulary-in-context usage?

Methods

This section presents the information about the participants, the instruments, the data collection, and the data analysis.

1. Participants

The participants consisted of **fifty-three English-majored, second-year Thai students** who were registered for the required course 205262 English Morphology and Syntax in semester 1/2016 at Naresuan University. This group of students was purposively selected because the answers to the research questions would provide direct benefits to the management of this course. The participants joined in the research project with full consent, and they were paid for the participation. All these informants had studied the English language essentially through classroom learning in Thailand for about 12 years prior to the time of the data collection.

2. Instruments

To obtain answers to the five research questions, **four multiple-choice tests** were constructed by the researcher. All the target complex words in the tests were retrieved from the main textbook of the course 205262 English Morphology and Syntax.

2.1 Test 1: Awareness of morphemic structures

Test 1 was designed to answer research question (1), which aimed to elicit the participants' awareness of the morphemic structures (i.e., ability to decompose words into morphemes). For example, the word "unreliably" was given with the following four choices: (A) un-re-liable-ly, (B) un-reliable-ly, (C) un-re-lie-able-ly, (D) unreliable, and the participants were expected to choose (C), reflecting the ability to divide up the given words into morphemes. For each question, three of the designated choices applied morphemic decomposition, and one of them applied no decomposition. Test 1 contained **twenty-two** target **derived** and **inflected** words: (1) six 2-morpheme words (e.g., wooden), (2) eight 3-morpheme words (e.g., unlocks), (3) four 4-morpheme words (e.g., impossibly), and (4) four 5-morpheme words (e.g., conductors'). The **free roots** consisted of "spoon, wood, lock, light, agree, debt, mercy, friend, salmon, alumnus, know, thesis, color." The **bound** roots consisted of "-loc- "place," -vis- "see," -port- "carry," -poss- "power," -lumin- "light," -dict- "say," -spect- "look," -duct- "lead," -rupt- "break." The (derivational) **prefixes** were "un- (not), un- (in opposite direction), im- (not), in- (not), in- (into), dis- (not), dis- (in opposite direction) co(r)-, con- (with, together), en- (to cause), pre- (before), ex- (out, former). The **derivational suffixes** consisted of (1) the noun-forming suffixes "-ful, -ing, -ity, -or," (2) the verb-forming suffixes "-en, -ate," (3) the adjective-forming suffixes "-en, -ful, -able, -ed, -ly," and (4) the adverb-forming suffix "-ly." The **inflectional suffixes** included (1) the **regular** ones: plurality "-s," present tense 3rd person singular "-s," possessive "-s," comparative degree "-er," past tense "-ed," past participle "-ed," present participle "-ing" and (2) the **irregular** ones: "alumni (plural), theses (plural), (two) salmon (plural), knew (past tense).

2.2 Test 2: Awareness of morphemic meanings

Test 2 was designed to answer research question (2), which aimed to examine the participants' awareness of morphemic meanings, which consisted of the meanings of the prefixes, the free roots, the bound roots, the derivational suffixes, and the inflections. This test contained the **same twenty-two** target words as those in Test 1. In Test 2, each question was obtained from the correct answer from Test 1, and the participants were asked to choose only one answer choice from the given four, which described the correct meaning of each and every constituent morpheme (choices written in Thai). For instance, the question was "unreliably" = un + re +lie + able + ly," and the answer expected was "not (ไม่) + again (อีกครั้ง) + วาง + suffix สร้างคำคุณศัพท์ + suffix สร้างคำวิเศษณ์." The participants would not receive Test 2 to complete until they finished Test 1. As for research question (3), the answers obtained from Test 1 and Test 2 were used for the correlation analysis.

2.3 Test 3: Awareness of selectiveness of derivation constraint

Test 3 was designed to answer research question (4), which aimed to elicit the participants' awareness of the selectiveness of derivation constraint. It contained **fifteen** target complex words with the following derivational suffixes: those selecting a noun: "-al, -en, -ly, -y (i.e., natural, golden, sisterly, wealthy)," those selecting a verb: "-al, -ment, (i.e., approval, measurement)," those selecting an adjective: "-ness, -ity, -en, -ly, (i.e., loveliness, sensitivity, darken, commonly)," those selecting a noun or a verb: "-ive (i.e., expensive, communicative)," and those selecting a noun or an adjective: "-ize (i.e., computerize, realize)." The prefixes consisted of those selecting a verb "un-," meaning "in opposite direction" (i.e., undo) and those selecting an adjective "un-, in-" meaning "not" (i.e., unreliable, inconctrollable). An example of Test 3 was as follow: the question was "-er," "noun-forming suffix" = suffix สร้างคำนาม, and the four multiple choices were: (A) visualize + -er, (B) happy + -er, (C) quickly + -er, (D) fog + -er, and the correct answer was A, showing that "-er" selecting the right part of speech to be attached to (i.e., a verb) to form a noun as requested in the question.

2.4 Test 4: Vocabulary-in-context usage

Test 4 was designed to provide one part of the answer to research question (5), which aimed to investigate a correlation among the awareness of the morphemic structures, that of the morphemic meanings, and the usage of vocabulary in contexts. There were **twenty-two** questions, and the target answers were a subset of the target words used in Test 1 (e.g., dislocating, invisibilities, unpredictability, unlocks, spoonfuls, wooden, corrupted, disagreed, etc.). The participants were requested to choose only one word which would make the given sentence

meaningful and grammatically correct. The sentences were designed to elicit the learners' judgment about the prefixes, the free roots, the bound roots, and the suffixes. An example of Test 4 was as follow: the question was "Have all the boxes ..... so that we can put one more book into them.," and the four choices were (A) untieable, (B) untied, (C) distied, (D) overtied. The correct answer was B, where the learners had to use their knowledge of the prefix "un-," in the sense that it meant "in an opposite order," not "not," and the context "put one more book" required a vocabulary which meant "to unfasten the knot," not "not to tie the knot."

The four tests were calculated for their **reliability** by using Cronbach's alpha. The value was .598, which meant that the tests were generally accepted as indicating a **moderately reliable** scale (Hinton, Brownlow, McMurray, and Cozens, 2004). In addition, the following Naresuan University grading scale was applied for description of the levels of awareness: 80-100% (excellent), 75-79% (very good), 70-74% (good), 65-69% (fairly good), 55-64% (fair), 50-54% (poor), 45-49% (very poor), and 0-44% (failed).

3. Data Collection

With signed consent, every participant came on **two** appointed days to do the tests, which took place in the second week of the course 205262 English Morphology and Syntax. On Day 1, the participants worked on Test 1 and Test 2 within two hours. On Day 2, the participants worked on Test 3 followed by Test 4 within two hours. Then the answers were marked.

4. Data Analysis

For all the four tests, each correct answer was given a one point, and each incorrect answer was given a zero point. Then, statistical analyses proceeded as follow.

4.1 Research question 1: Awareness of morphemic structures

The answers obtained from test 1 were 1,166 items (53 participants x 22 answers). The percentage of these correct occurrences was calculated and used as a mean score for a further application of **non-parametric Friedman Test** to find a mean rank and a significant difference value among the four complex word groups: two-morpheme, three-morpheme, four-morpheme, and five-morpheme words. The same statistical procedures applied to the free versus bound root groups, except that **Wilcoxon Signed Ranks Test** was used instead of non-parametric Friedman Test. The statistic results were used to attest or to refute the hypotheses in regard to the effects of the number of constituent morphemes and the root types on the morphemic decomposition.

4.2 Research question 2: Awareness of morphemic meanings

The answers obtained from Test 2 were 1,166 items (53 participants x 22 answers). Then, the **same statistical analyses** proceeded like those applied to the answers to Test 1. The statistic results were used to attest or to refute the hypotheses in regard to the effects of the number of constituent morphemes and the root types on the morphemic deciphering.

4.3 Research question 3: Correlation between awareness of morphemic structures and awareness of morphemic meanings

Pearson correlation was applied to the answers obtained from Test 1 and Test 2.

4.4 Research question 4: Awareness of selectiveness of derivation constraint

The answers obtained from Test 3 were 795 items (53 participants x 15 answers). The **frequency and percentage** of correct answers were calculated to describe the levels of awareness.

4.5 Research question 5: Correlation among awareness of morphemic structures and awareness of morphemic meanings, and vocabulary-in-context usage

Pearson correlation was applied to the answers to Test 1, Test 2, and Test 4.

Findings

The findings were presented in 5 sections as responses to the five research questions.

Finding One: Awareness of morphemic structures

Among the total of 1,166 target answers in Test 1, the learners gave 707 correct responses, making a score of 60.64% and revealing a ***fair*** level of awareness of morphemic structures (i.e., the learners' ability to decompose the complex words into morphemes). The percentage of the correct responses from the highest to the lowest was as follow: the three-morpheme word group (78.77%), the five-morpheme word group (64.62%), the four-morpheme word group (57.55%), and the two-morpheme word group (35.85%). See Table 1 for the mean rank and the significant difference value obtained by non-parametric Friedman Test.

Table 1 Thai Learners' Awareness of Morphemic Structures in English Complex Words Containing Different Numbers of Constituent Morphemes

Ranks

Complex Words	Mean Rank
Three-morpheme words	3.38
Five-morpheme words	2.78
Four-morpheme words	2.42
Two-morpheme words	1.42

Test Statistics[a]

N	53
Chi-Square	70.055
df	3
Asymp. Sig.	.000

a. Friedman Test

A **non-parametric Friedman Test** of differences among the four groups of the complex words was conducted and rendered a Chi-square value of 70.06 which was **significant** ($p<.01$). This means that the **three-morpheme** complex words (e.g., spoonfuls, unlocks, importable, indebted, friendlier, discolored, corrupted, disagreed) were decomposed significantly more correctly than all the other word groups; whereas, the **two-morpheme** complex words (e.g., wooden, merciful, alumni, knew, theses, salmon) were decomposed significantly less successfully than all the other word groups. In between, the five-morpheme complex words were decomposed significantly better than the four-morpheme word group. **Hypothesis (1)** "the more morphemes the word contained; the higher the chances were the learners would fail in the decomposition task" was **refuted**. In brief, the statistic results suggest that the number of the constituent morphemes did **not entail** the difficulty of the morphemic decomposition to the Thai learners.

In case of the effect of the free and bound roots, of the total of 1,166 target responses, the complex words containing the bound roots were decomposed accurately for 61.22% of the time (e.g., cor**rupt**ed, im**port**able, im**poss**ibly, dis**loc**ating, il**lumin**ating, in**vis**ibilities, unpre**dict**ability, une**xpect**edly, con**duct**ors'), and those containing the free roots were decomposed accurately for 60.23% of the time (e.g., **wood**en, **merci**ful, **alumni**, **knew**, **theses**, **salmon**, **spoon**fuls, un**lock**s, in**debt**ed, **friend**lier, dis**colore**d, dis**agree**d, en**light**ens). See Table 2 for the statistical evidence.

Table 2 Thai Learners' Awareness of Morphemic Structures in English Complex Words Containing Free and Bound Roots

Ranks

Types of Roots		N
Bound roots – Free roots	Negative Ranks	27[a]
	Positive Ranks	26[b]
	Ties	0[c]
	Total	53

a. Bound roots < Free roots, b. Bound roots > Free roots, c. Bound roots = Free roots

Test Statistics[a]

	Bound roots – Free roots
Z	-.071[b]
Asymp. Sig. (2-tailed)	.944

a. Wilcoxon Signed Ranks Test, b. Based on negative ranks

A **Wilcoxon Signed Ranks Test** indicated that there was **no difference** in the learners' awareness of free roots and bound roots, Z = .071, p>.05. **Hypothesis (2)** "the decomposition of words with bound roots was likely to fail more than that of words with free roots" was refuted. The statistic results suggest that the presence of free and bound roots in English complex words did **not entail** a different level of difficulty of morphemic decomposition.

Finding Two: Awareness of morphemic meanings

Among the total of 1,166 target answers, the learners gave 691 correct responses, making a score of 59.26% and reflecting a ***fair*** level of awareness of morphemic meanings (i.e., the learners' ability to decipher the meaning of each constituent morpheme). The percentage of correct responses from the highest to the lowest was as follow: the two-morpheme complex words (81.13%), the five-morpheme complex words (78.30%), the four-morpheme complex words (52.36%), and the three-morpheme complex words (36.79%). See Table 3 for the mean rank and the significant difference value obtained by non-parametric Friedman Test.

Table 3 Thai Learners' Awareness of Morphemic Meanings in English Complex Words Containing Different Numbers of Morphemes

Ranks

Complex Words	Mean Rank
Two-morpheme words	3.27
Five-morpheme words	3.28
Four-morpheme words	2.02
Three-morpheme words	1.42

Test Statistics[a]

N	53
Chi-Square	89.969
df	3
Asymp. Sig.	.000

a. Friedman Test

A **non-parametric Friedman Test** of differences among the four groups of the complex words was conducted and rendered a Chi-square value of 89.97 which was **significant** ($p<.01$). This means that the **two-morpheme** complex words were deciphered for their morphemic meanings significantly more correctly than all the other word groups; whereas, the **three-morpheme** complex words were deciphered significantly less correctly than all the other word groups. In between, the five-morpheme complex words were deciphered significantly better than the four-morpheme word group. **Hypothesis (1)** "the more morphemes the word contained; the higher the chances were the learners would fail in the deciphering task" was refuted. The statistic results suggest that the number of the constituent morphemes did **not entail** the difficulty of the morphemic deciphering.

In regard to the effect of the free and bound roots, of the total of 1,166 target responses, the complex words containing the bound roots were deciphered for their morphemic meanings accurately for 62.26% of the time, and those containing the free roots were deciphered accurately for 57.18% of the time. See Table 4 for the statistical evidence.

Table 4 Thai Learners' Awareness of Morphemic Meanings in English Complex Words Containing Free and Bound Roots

Ranks

Types of Roots		N
Bound roots – Free roots	Negative Ranks	24[a]
	Positive Ranks	29[b]
	Ties	0[c]
	Total	53

a. Bound roots < Free roots, b. Bound roots > Free roots, c. Bound roots = Free roots

Test Statistics[a]

	Bound roots – Free roots
Z	-1.404[b]
Asymp. Sig. (2-tailed)	.160

a. Wilcoxon Signed Ranks Test, b. Based on negative ranks

A **Wilcoxon Signed Ranks Test** indicated that there was **no difference** in the learners' awareness of the free roots and bound roots, $Z = 1.404$, $p>.05$. **Hypothesis (2)** "the deciphering of words with bound roots was likely to fail more than that of words with free roots" was refuted. The statistic results suggest that the presence of free and bound roots in English complex words did **not entail** a different level difficulty of morphemic deciphering.

Finding Three: Correlation between awareness of constituent morphemes and awareness of meaning of each constituent morpheme

Pearson Correlation was applied to the data obtained from Test 1 and Test 2 to find out about the correlation between the two aspects of awareness. See the result in Table 5 below.

Table 5 Correlation between Awareness of Morphemic Structures and Awareness of Morphemic Meanings

Types of Awareness	Percentage	Mean	SD	N
Awareness of morphemic structures	60.64	13.34	2.81	53
Awareness of morphemic meanings	59.26	12.98	2.85	53

Types of Awareness		Awareness of morphemic structures	Awareness of morphemic meanings
Awareness of morphemic structures	Pearson Correlation	1	.219
	Sig. (2-tailed)		.115
	N	53	53
Awareness of morphemic meanings	Pearson Correlation	.219	1
	Sig. (2-tailed)	.115	
	N	53	53

The significant difference values (0.115) showed that there was **no correlation** between the awareness of the morphemic structures and the awareness of the morphemic meanings. This means that although the learners were successful in decomposing the complex words into morphemes, it was not necessary that they were successful in deciphering the meaning of each constituent morpheme, and vice versa.

Finding Four: Awareness of selectiveness of derivation constraint

Among the total of 795 target responses to Test 3, the learners gave 440 correct answers, making a score of 55.35% and indicating a ***fair*** level of awareness of the selectiveness of derivation constraint. See Table 6 for the frequency and percentage of correct occurrences.

Table 6 Awareness of Selectiveness of Derivation Constraint

No.	Derivational Affixes	Targeted Parts of Speech of Bases	Frequency of Correct Responses	Percentage of Correct Responses	Meaning
1	**-al** "adjective"	Noun	44	83.02%	Excellent
2	**-en** "adjective"	Noun	43	81.13%	Excellent
3	**-ness** "noun"	Adjective	39	73.58%	Good
4	**-ment** "noun"	Verb	38	71.70%	Good
5	**-ly** "adverb"	Adjective	37	69.81%	Good
6	**un-** "not"	Adjective	36	67.92%	Fairly good
7	**-y** "adjective"	Noun	35	66.03%	Fairly good
8	**-en** "verb"	Adjective	33	62.26%	Fair
9	**-ive** "adjective"	Noun/ Verb	31	58.49%	Fair
10	**un-** "opposite"	Verb	29	54.72%	Fair
11	**-al** "noun"	Verb	22	41.51%	Failed
12	**-ize** "verb"	Noun/adjective	22	41.51%	Failed
13	**-ity** "noun"	Adjective	14	26.42%	Failed
14	**-ly** "adjective"	Noun	12	22.64%	Failed
15	**in-** "not"	Adjective	5	9.43%	Failed
Overall level of awareness (795 total)			**440**	**55.35%**	**Fair**

Table 6 showed that the level of awareness of the selectiveness of derivation restriction varied from one affix to another: from the "**excellent**" level to "**failure.**" For instance, the learners were very much aware that the adjective-forming suffixes "-al, -en" selected a noun to be attached to (i.e., natural, golden), but they failed to select the right parts of speech of the bases for the suffixes "-al, -ize, -ity, -ly" (adjective-forming suffix) (i.e., approval, computerize, realize, sensitivity, sisterly)" and the prefix "in-" (not) to be attached to (i.e., incontrollable).

Finding Five: Correlation between awareness of morphemic structures, awareness of morphemic meanings, and vocabulary-in-context usage

Among the total of 1,166 target responses to Test 4, the learners gave 814 correct answers, making a score of 69.81% and stating a ***good*** level of success in choosing the right word to

complete a sentence. To examine the correlation among the awareness of morphemic structures, the awareness of morphemic meanings, and the use of vocabulary in contexts, **Pearson Correlation** was applied. See Table 7 for the statistical evidence.

Table 7 Correlation among Awareness of Morphemic Structures, Awareness of Morphemic Meanings, and Vocabulary-in-Context Usage

		Awareness of Morphemic Structures	Awareness of Morphemic Meanings	Vocabulary-in-Context Usage
Awareness of Morphemic Structures	Pearson Correlation	1	.257	.269
	Sig. (2-tailed)		.063	.051
	N	53	53	53
Awareness of Morphemic Meanings	Pearson Correlation	.257	1	.362**
	Sig. (2-tailed)	.063		.008
	N	53	53	53
Vocabulary-in-Context Usage	Pearson Correlation	.269	.362**	1
	Sig. (2-tailed)	.051	.008	
	N	53	53	53

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

Table 7 showed that there was **no correlation** between the awareness of morphemic structures and the use of vocabulary in contexts, but there was **correlation** between the awareness of **morphemic meanings** and the use of **vocabulary** in contexts at a low level ($r = .362$, $p = .008$), based on Evans (1996). This means that if the learners knew the meanings of the constituent morphemes, they would be more successful in choosing the right words to complete the sentences meaningfully and grammatically. On the other hand, if the learners knew the morphemic structures of the complex words, it was not necessary that they could find the right words to complete the sentences.

Conclusion

The Thai learners had a **fair** level of morphological awareness, consisting of the awareness of the morphemic structures, the awareness of the morphemic meanings, and the selectiveness of derivation constraint. The increased **number** of constituent morphemes and the **bound** roots did **not entail** increased difficulty in **decomposing** words into morphemes and in **deciphering** the morphemic meanings. In addition, being aware of the morphemic structures did not necessarily indicate being aware of the morphemic meanings, and vice versa. As for the **selectiveness** of derivation, its awareness was not consistent. The derivation satisfied the constraint in only some affixes. Finally, the ability to decipher the meanings of the constituent morphemes contributed to the usage of **vocabulary** in contexts significantly more than the ability to only decompose words into morphemes.

Discussion

This study provided a **new addition** to research on EFL morphology of Thai learners- that is, Ward and Chuenjundaeng (2009) described the Thai learners' (Engineering- and Medicine-majored students') knowledge about some common English suffixes; this research described the Thai learners' (English-majored students') knowledge about **all types of morphemes** in English **two-to-five morpheme** complex words and about a **selectiveness** constraint involved in derivation. Moreover, it provided new additions to research on EFL/L2 morphology in general, and these additions consisted of the following aspects (1) no correlation between the increased number of constituent morphemes (i.e., **multiple derivation**) and the **root types** (i.e., free and bound roots) and morphological awareness, (2) no correlation between awareness of morphemic **structures** and awareness of morphemic **meanings**, (3) a positive impact of awareness of morphemic meanings, not awareness of morphemic structures, on **vocabulary**-in-context usage. All these new additions filled up or expanded the findings suggested by Jeon (2011); Oz (2014); Zhang and Koda (2012 and 2013); Zhang, Koda, and Sun (2014).

In regard to the issues of **L1 transfer**, the refutation of the two hypotheses reported in Finding 1 and Finding 2 implied that the concept of L1 transfer **failed** to account for the status of the Thai participants' morphological awareness. As declared in "Conceptual Framework," following such previous frameworks and findings as Deng, Shi, Dunlap, Bi, and Chen (2016); Ellis (2002); Gass and Selinker (1994); Karlsson (2015); Li (2017); Oz (2014); Saville-Troike (2004); Zhang and Koda (2013); Zhang, Koda, and Sun (2014), this research had expected that the Thai learners would carry over the derivation mechanism from Thai into English, but it was likely that they would encounter the challenges of the inflection, the multiple derivation (i.e., multi-morpheme words), the bound roots, and the selectiveness of derivation in English and possibly failed in morphological

decomposition and deciphering. However, Findings 1, 2, and 4 proved that the hypotheses were wrong because the increased number of the constituent morphemes in a word and the use of inflection and bound roots did not hinder the Thai learners' morphemic decomposition and deciphering, and the selectiveness of derivation constraint was satisfied in several cases of affixes. Instead, it was possible to claim that these learners had been exposed to the English language for a very long time (i.e., an average of 12 years), so they had acquired complex words from various sources such as through classroom learning and/or through direct experiences to the language and to the native speakers. Therefore, the learners had possessed a certain level of morphological awareness from their **exposure** (probably from exposure to derivation in Thai too) prior to the time they worked on the MA tests. The fair level of MA proved that they were free from L1 interference despite the fact they were not yet instructed the internal structures of English complex words offered in the course English Morphology and Syntax for which they were being registered.

Besides, a few findings of the current research deserved additional attention. Although the increased number of the constituent morphemes did not affect the decomposition and deciphering tasks, a few questions remained to be explained as to why some target groups of the complex words were decomposed and deciphered significantly better than others. Two factors were found potential accounts: (1) regular versus irregular inflection (supporting Karlsson, 2015; Masrai, 2016) and (2) polysemy of affixes (supporting Mochizuki and Aizawa, 2000). In regard to the **(ir)regularity** of inflection, as reported in Finding 1, the three-morpheme word group was decomposed significantly more successfully than all the other groups because it contained no irregular inflection as in "spoonfuls, unlocks, importable, indebted, friendlier, discolored, corrupted, disagreed"; whereas, the learners failed only in decomposing the two-morpheme word group because it was the only group which contained irregular inflection as in "plurality in "alumni, theses, (two) salmon" and "past tense in "knew."

In terms of the **polysemy** of affixes, as reported in Finding 2, the three-morpheme word group was deciphered for the morphemic meanings the least successfully, probably because this group carried the most polysemous affixes such as "spoon*ful*s, *un*locks, *im*portable, *in*debted, friend*li*er, *dis*colored. And, it was noticed that the meaning which each italicized affix expressed was less frequent than its counterpart; e.g., "-ful" ("a noun-forming suffix," instead of "an adjective-forming suffix"), "un-" ("in an opposite order," instead of "not"), "im-" ("into," instead of "not"), "in-" ("into," instead of "not"), "ly-" ("an adjective-forming suffix," instead of "an adverb-forming suffix"), and "dis-" ("in an opposite order," instead of "not"). Therefore, with an assumption of the

polysemy of affixes, we could explain the significant cases effectively. To support the factor of polysemous affixes in Finding 2, Finding 4 revealed that the selectiveness of derivation constraint was more successfully followed in the polysemous affixes which carried the more **common** meanings. That is the affixes with a more common meaning or usage were attached to the right parts of speech of the bases more frequently than those with a less common one. The following examples illustrated the point: the suffixes "-al" (an adjective-forming suffix, 83.02%, "natural") versus "-al" (a noun-forming suffix, 41.51%, "approval"); "-ly" (an adverb-forming suffix, 69.81%, "commonly") versus "-ly" (an adjective-forming suffix, 22.64%, "sisterly"); "-en" (an adjective-forming suffix, 81.13%, "golden") versus "-en" (a verb-forming suffix, 62.26%, "darken"), and the prefix "un-" (not, 67.92%, "unreliable") versus "un-" (in opposite direction, 54.72%, "undo"), etc. All in all, the concepts of "(ir)regularity of inflection" and "polysemy of affixes" in English morphology provided an effective account for the phenomena of the different levels of morphological awareness and selectiveness awareness across different word groups.

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Implications

This study sheds light on the management of English morphology classes and English reading classes for Thai learners. In the morphology classes, a few extra sessions may need be invested for instructional treatments of regular versus irregular inflection, polysemy of affixes, and the selectiveness of derivation constraint, and the connection between morphemic structures and meanings. The reason is that these morphological aspects were found the areas of challenges to the Thai learners. In the English reading classes, a balanced instruction of the English morphemes and their meanings is recommended so that the students can familiarize themselves with not only the morphemic forms but also their meanings, which were found rendering a powerful effect on reading tasks.

Recommendations for further research

The English language proficiency of Thai learners is suggested to be included in a future study. By doing so, a developmental path of EFL morphology is revealed, and L1 transfer may be found active at some point of the acquisition or at some level of proficiency. The issues about the polysemy of affixes and the selectiveness of derivation constraint still call for further depictions such as systematic patterns of their occurrences, an error analysis, and teaching methods for these phenomena.

References

Akbulut, F. D. (2017). Effects of morphological awareness on second language vocabulary knowledge. ***Journal of Language and Linguistic Studies,*** 13(1), 10-26.

Carstairs-McCarthy, A. (2010). ***An introduction to English morphology: Words and their structure***. Edinburgh: Edinburgh University Press.

Deng, T., Shi, J., Dunlap, S., Bi, H., & Chen, B. (2016). Morphological knowledge affects processing of L2 derivational morphology: An event-related potential study. ***Journal of Neurolinguistics,*** 37, 47-57.

Dyson, B. (2009). Processability theory and the role of morphology in English as a second language development: A longitudinal study. ***Second Language Research, 25***(3), 355-376.

Ellis, R. (2002). ***The study of second language acquisition*** (9th ed.).Oxford: Oxford University Press.

Evans, J. D. (1996). ***Straightforward statistics for the behavioral sciences***. Pacific Grove, CA: Brooks/Cole Publishing.

Flanigan, K., Templeton, S., & Hayes, L. (2012). What's in a word? Using content vocabulary to generate growth in general academic vocabulary knowledge. ***Journal of Adolescent & Adult Literacy,*** 56(2), 132-140.

Fromkin, V., Rodman, R., & Hyams, N. (2017). ***An introduction to language***. MA: Boston.

Gass, S. M.andSelinker, L. (1994). ***Second language acquisition: An introductory course***. New Jersey: Lawrence Erlbaum Associates.

Hashemi, M., & Aziznezhad, M. (2011). Etymology: A word attack strategy for learning the English vocabulary. ***Social and Behavioral Sciences,*** 28, 102-106.

Haspelmath, M. & Sims, A. D. (2010). ***Understanding morphology*** (2nd ed.). London: Routledge.

Hinton, P.R., Brownlow, C., McMurray, I., & Cozens, M. (2004). ***SPSS explained***. London: Routledge

Iwasaki, S. & Ingkaphirom, P. (2005). ***A reference grammar of Thai***. New York: Cambridge University Press.

Jeon, E. H. (2011). Contribution of morphological awareness to second-language reading comprehension. ***The Modern Language Journal,*** 95, ii, 217-236.

Karlsson, M. (2015). Advanced students' L1 (Swedish) and L2 (English) mastery of suffixation. ***International Journal of English Studies,*** 15(1), 23-49.

Kraut, R. (2015). The relationship between morphological awareness and morphological decomposition among English language learners. ***Read Writ,*** 28, 873-890.

Lardiere, D. (2006). Words and their parts. In R. Fasold & J. Conner-Linton (Eds.), ***An introduction to language and linguistics*** (pp.55-96). Cambridge: Cambridge University Press.

Li, M. (2017). The effect of L1 Chinese transfer on L2 English learning: A brief review of the research. ***Theory and Practice in Language Studies,*** 7(5), 350-355.

Lieber, R. (2010). ***Introducing morphology***. Cambridge: Cambridge University Press.

Masrai, A. M. (2016). The influence of morphological knowledge on lexical processing and acquisition: The case of Arab EFL learners. ***Ampersand,*** 3, 52-60.

Mochizuki, M., & Aizawa, K. (2000). An affix acquisition order for EFL learners: An exploratory study. ***System,*** 28, 291-304.

Oz, H. (2014). Morphological awareness and some implications for English language teaching. ***Social and Behavioral Sciences,*** 136, 98-103.

Paiman, N., Thai, Y. N., & Yuit, C. M. (2015). Effectiveness of morphemic analysis of Graeco-Latin word parts as a vocabulary learning strategy among ESL learners. ***3L: The Southeast Asian Journal of English Language Studies,*** 21(2), 31-45.

Saville-Troike, M. (2004). ***Introducing second language acquisition*** (3rd ed.). New York: Cambridge University Press.

Solati, A. (2014). Word-formation: A systematic way to enrich power of medical students. ***Modern Journal of Language Teaching Methods,*** 4(1), 20-33.

Tahaineh, Y. (2012). The awareness of the English word-formation mechanisms is a necessity to make an autonomous L2 learner in EFL context. ***Journal of Language Teaching and Research,*** 3(6), 1105-1113.

Ward, J., & Chuenjundaeng, J. (2009). Suffix knowledge: Acquisition and applications. ***System,*** 37, 461-469.

Zhang, D., & Koda, K. (2012). Contribution of morphological awareness and lexical inferencing ability to L2 vocabulary knowledge and reading comprehension among advanced EFL learners: testing direct and indirect effects. ***Read Writ,*** 25, 1195-1216.

Zhang, D., & Koda, K. (2013). Morphological awareness and reading comprehension in a foreign language: A study of young Chinese EFL learners. ***System,*** 41, 901-913.

Zhang, D., Koda, K., & Sun, X. (2014). Morphological awareness in biliteracy acquisition: A study of young Chinese EFL readers. ***International Journal of Bilingualism,*** 18(6), 570-585.

Zhang, Y. & Widyastuti, I. (2010). Acquisition of L2 English Morphology: A family case study. ***Australian Review of Applied Linguistics,*** 33(3), 29.1-29.17.