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**The Role of Frequency on the Acquisition of L2
English Infinitive and Gerund Complements by L1
Thai Learners**

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Abstract

This study investigated how frequency influenced acquisition of L2 English infinitive and gerund complements among L1 Thai learners. Participants were separated into low and high proficiency groups based on their CU-TEP scores. Each group consisted of 30 participants. Data were collected using the Word Selection Task (WST) and the Grammaticality Judgement Test (GJT). Initial findings revealed that L1 Thai learners acquired infinitive complements before gerund complements. This could probably be explained by the usage-based theory, specifically, the concept of type frequency. It was assumed that learners acquired infinitive complements first because they were considered a high type frequency construction, and gerund complements later because they were considered a low type frequency construction. It was assumed that the high type frequency construction was

easier for L2 learners to acquire because they were exposed more often to this construction type. Further investigation revealed that the frequency of verbs occurring in the target complement constructions probably contributed to the learners' low-level constructional schemas (i.e. the abstract representations of constructions which are lexically specific) and their language use.

Keywords: acquisition order, L2 English, infinitive and gerund complements, L1 Thai, usage-based approach

Introduction

In recent decades, the usage-based theory has emerged as a response to traditional mainstream generative approaches to language (Bybee, 2010; Bybee & Beckner, 2009; Dabrowska, 2004; Goldberg, 2006; Langacker, 2008; Tomasello, 2003). According to this theory, language acquisition improves remarkably through language use, and not strictly because of innate ability, as generative linguists have previously thought (Bybee & Beckner, 2009; Croft & Cruse, 2004). Furthermore, repeated experiences of particular linguistic elements is very important in forming strong cognitive or abstract representations of linguistic knowledge, and in using them as templates for future language use (Bybee, 2010; Bybee & Thompson, 1997). Hence, as a part of its nature, frequency, usually called 'repetition', is an important factor in language acquisition. According to Ellis (2002), the frequency with which second language (L2) learners have been exposed to linguistic elements can be an important facilitator in second language acquisition (SLA). Nevertheless, the exact role of frequency has yet to be clearly understood, particularly, in SLA (Almulla, 2015), because frequency usually interacts with other factors such as semantic basicness and perceptual salience (Ellis, 2002; Ellis & Collins, 2009; Gass & Mackey, 2002). Therefore, this exploratory research was an attempt to get a better understanding of the effects of frequency on the acquisition of English infinitive and gerund complements by L1 Thai learners.

The investigation of these two features is significant for the following reasons. First, many L2 learners of English appear confuse these two complement constructions (Schwartz & Causarano, 2007). Second, grammarians and language teachers think the infinitive and gerund complement constructions are very difficult to teach or even unteachable because of their complexity (Kitikanan, 2011; Schwartz & Causarano, 2007). Third, it is virtually impossible to distinguish verbs triggering the infinitive complement construction from verbs triggering the gerund complement construction without consulting a good dictionary (Swan, 2005). Finally, it is more interesting to look specifically at L1 Thai learners' production and perception of English infinitive and gerund complement constructions because they have no parallel in Thai (Lekawatana et al., 1969; Mallikamas, 2010).

To the best of the researchers' knowledge, there has been much research exploring the acquisition of infinitive and gerund complements among L2 English learners from different native languages such as L1 Arabic (Almulla, 2015), L1 Spanish (Schwartz & Causarano, 2007), and L1 Thai (Kitikanan, 2011; Samana, 2005). While most of the studies agree that L2 learners of English acquired infinitive complements before gerund complements (Almulla, 2015; Samana, 2005; Schwartz & Causarano, 2007), one study produced the opposite results (Kitikanan, 2011). This study showed that L1 Thai learners were better using gerund complements than infinitive complements. But research has never been conducted on the acquisition of these two English language features among L1 Thai learners using the usage-based theory, together with the different results from the same L1 Thai context. The current study filled in this gap by first investigating the acquisition order of L2 English infinitive and gerund complements among L1 Thai learners, with the usage-based theory as the main theoretical framework. Second, since studies of the effect of frequency on low-level constructional schemas have been inconclusive (Almulla, 2015), the current study also looked at how frequency of verbs occurring in the target complement constructions affected the entrenchment of Thai learners' low-level constructional schema and their language use. As mentioned, repetition and frequency establish strong cognitive or abstract representations of linguistic constructions or constructional schemas. Correspondingly, under the umbrella of the usage-based theory, the abstract

representations of complex constructions or constructional schemas can also be represented in various levels of abstraction, namely, high and low-level constructional schemas (Dabrowska, 2004; Langacker, 2008). The high-level constructional schemas are abstract representations of the general patterns, or general rules, of complex constructions. For example, the high-level constructional schema covering all possibilities of verbs for the ditransitive construction can be illustrated as [VERB NOUN NOUN] (Langacker, 2008). On the other hand, low-level constructional schemas represent a lesser degree of abstractness, are more lexically specific than the abstract representations of general patterns (Dabrowska, 2004; Langacker, 2008). For example, the low-level constructional schema for the ditransitive construction can be represented as [GIVE NOUN NOUN], [SEND NOUN NOUN] or [THROW NOUN NOUN], depending on the entrenchment of verbs through language use (Langacker, 2008).

This study was conducted to test the following research hypotheses:

- (1) Following the usage-based theory, Thai learners will acquire infinitive complements before gerund complements.
- (2) Following the usage-based theory, the frequency of verbs occurring in target complement constructions will contribute to the entrenchment of Thai learners' low-level constructional schemas and their language use.

Literature Review

Usage-based theory

This section describes the nature of linguistic knowledge from the usage-based point of view and other related issues, including constructional schemas and types of frequency.

- ***Constructional schemas***

Language constructions are stored in the speaker's mind as schemas. Constructions based on actual usage events are recognized, categorized and abstracted, or schematized, into cognitive templates or skeletal representations of shared organizational features (Dabrowska, 2004; Langacker, 2008). Once the schemas are established, they function as templates for the creation and interpretation of new

expressions (Langacker, 2008). Correspondingly, abstract representations of complex constructions, or constructional schemas can be in various levels of abstraction, namely, high and low-level constructional schemas (Dabrowska, 2004; Langacker, 2008). High-level constructional schemas are the abstract representations of general patterns, or general rules, of complex constructions. For example, the high-level constructional schema covering all possibilities of verbs for the ditransitive construction can be illustrated as [VERB NOUN NOUN] (Langacker, 2008). On the other hand, low-level constructional schemas represent a lesser degree of abstractness. They are more lexically specific than abstract representations of general patterns (Dabrowska, 2004; Langacker, 2008). For example, the low-level constructional schema for the ditransitive construction could be [GIVE NOUN NOUN], [SEND NOUN NOUN] or [THROW NOUN NOUN], depending on the entrenchment of verbs based on language use (Langacker, 2008).

- ***Types of frequency***

The usage-based theory, as the name implies, holds that linguistic knowledge is built up primarily by usage rather than innate ability (Bybee & Beckner, 2009; Croft & Cruse, 2004). From the usage-based perspective, where language use determines grammatical representation in mind, a distinction must be clearly made between two kinds of frequency: token frequency and type frequency (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Croft, 2007; Croft & Cruse, 2004; Ellis & Collins, 2009). Token frequency is the count of occurrence in running texts of either particular words, such as 'broken' or 'have', or specific phrases, such as 'I don't think' (Bybee & Thompson, 1997). In other words, token frequency refers to the total number of occurrences of a word or phrase in language use (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Croft, 2007; Croft & Cruse, 2004; Ellis & Collins, 2009). The high token frequency of a word indicates a high number of usage events of that particular word (Croft & Cruse, 2004). Each time a word is used, the representation of that word, is entrenched or strengthened in the speaker's mind (Croft & Cruse, 2004; Dabrowska, 2004). Besides, the more frequently a word is accessed, the more easily it can be activated for future use, and vice-versa (Dabrowska, 2004).

Type frequency, conversely, refers to the number of distinct lexical items that can be substituted in a given slot in a construction. It can refer to a word-level construction for inflection, or a syntactic construction signifying the relation among words (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Ellis & Collins, 2009). A clear example of type frequency is the regular English past-tense inflection ‘-ed’, which can be applied to hundreds of different verbs in English (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Croft, 2007; Croft & Cruse, 2004; Ellis & Collins, 2009). Type frequency can also be divided into two groups: high type frequency and low type frequency. Examples of construction representing the high and the low type frequency are the regular English past-tense inflection and the vowel change pattern for the past form of some irregular verbs, respectively (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Croft, 2007; Croft & Cruse, 2004; Ellis & Collins, 2009). The regular English past-tense inflection has a very high type frequency since it can be applied to hundreds of different verbs, such as ‘watched’, ‘walked’, ‘talked’, ‘danced’ and ‘played’ (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Croft, 2007; Croft & Cruse, 2004; Ellis & Collins, 2009). On the other hand, the vowel change pattern for the past tense of some irregular verbs, such as ‘blow’ to ‘blew’, ‘throw’ to ‘threw’ and ‘flow’ to ‘flew’, has a much lower type frequency because it can only be applied to a limited number of verbs (Bybee & Beckner, 2009; Bybee & Thompson, 1997; Croft, 2007; Croft & Cruse, 2004; Ellis & Collins, 2009). Hence, it may be that type frequency is responsible for the entrenchment of a schema of a construction (Croft, 2007; Croft & Cruse, 2004). In addition, infinitive complements occur more frequently than gerund complements in both the British National Corpus (BNC) and the Corpus of Contemporary American English (COCA) (Almulla, 2015; Schwartz & Causarano, 2007). Infinitive complements, therefore, are considered a high type frequency construction, whereas gerund complements are considered a low type frequency construction (Almulla, 2015; Schwartz & Causarano, 2007).

Verbal complement structures in English and Thai

• *Verbal complement structure in English*

Infinitive and gerund complements are lexically based. That is, the main verb of the sentence determines which type of complement is permitted after it. Choosing the verbal complement to follow is, therefore, mostly verb specific (Almulla, 2015). Generally, verbs taking infinitive or gerund complements can be classified into three groups: 1) verbs taking only infinitive complements, 2) verbs taking only gerund complements and 3) verbs taking both infinitive and gerund complements (Almulla, 2015; Azar & Hagen, 2009; Kitikanan, 2011; Mallikamas, 2010; Mazurkewich, 1988; Schwartz & Causarano, 2007; Shirahata, 1990; Swan, 2005).

• *Verbal complement structure in Thai*

All Thai verbs are considered finite and verb forms are not changed as they would be in English to indicate non-finite characteristics (Mallikamas, 2010). Simple English sentences permit only one finite verb, the main verb of the sentence containing tense, the verb immediately following the main verb must change its form into to-infinitive or gerund, for example, to signify its non-finite characteristics (Mallikamas, 2010).

Previous studies

Schwartz and Causarano (2007) explored the role of frequency on the acquisition of L2 English infinitive and gerund complements by L1 Spanish learners. Participants were classified into advanced, high-intermediate and intermediate levels. The data were collected from the participants' writing assignments. The findings revealed that Spanish learners acquired infinitive complements before gerund complements, regardless of their levels. Schwartz and Causarano claimed the results could be explained by the concept of type frequency. Learners acquired infinitive complements first because it was a high type frequency construction. Conversely, learners acquired gerund complements later because it was a low type frequency construction.

Almulla (2015) investigated the role of frequency in L2 structure accuracy among L1 Arabic learners with the focus on English infinitive

and gerund constructions. Participants were classified into high proficiency and low proficiency groups. They were required to do a word-by-word self-paced reading grammaticality judgement test. The findings revealed that both groups were more accurate in reading the sentences with the infinitive construction, which was considered a high type frequency construction, than those with the gerund construction, which was considered a low type frequency construction. Almulla claimed that the high type frequency construction was easier for L2 learners to acquire because learners were exposed more frequently to this construction type. Almulla also investigated the effect of frequency of verbs occurring in the target constructions on the entrenchment of Thai learners' low-level constructional schemas and their performance. The findings revealed, however, that there was no significant effect.

In addition to previous studies conducted in Spanish and Arabic L1 contexts, some studies were also conducted in L1 Thai context.

Samana (2005) explored the developmental sequences of the Thai university students' complement interlanguage and their learning strategies. Participants were separated into high proficiency and low proficiency levels, and data were collected from their writing assignments. The findings revealed that the finite complements seemed to be more complicated than the non-finite ones. Both groups preferred to use non-finite complements. Among the non-finite complements, it seemed that 'to' infinitive complements were acquired before 'ing' complements as well as 'wh' infinitive complements since 'to' infinitive complements were used more frequently. Furthermore, for the finite complements, it seemed that 'that' complements were acquired before 'wh' complements. Also, Samana claimed that, when using complements, students used strategies such as formulaic expressions, language transfer, overgeneralization, transfer of training and hypercorrection.

Kitikanan (2011) investigated Thai learners' ability to use infinitive and gerund complements. Participants were Thai university students with mixed academic years of study and majors. They were required to finish an open-ended questionnaire. The findings revealed that Thai students were more capable with gerund complements than infinitive complements. Kitikanan suggested that the correct use of infinitive and gerund complements was influenced by transfer of

training, whereas most errors found in the learners' production were influenced by negative transfer.

Kitikanan's (2011) results diverged from those of Samana (2005), despite their use of the same theoretical framework, probably because of the lack of a clear identification of learners' proficiency levels and the use of participants from mixed academic year and background. Different research tools were not believed to be responsible for this situation because even though most of the previous studies (Almulla, 2015; Samana, 2005; Schwartz & Causarano, 2007) employed different research tools, they got similar results. To the best of our knowledge, there has been much research into the acquisition of English infinitive and gerund complements among different L2 learners, including L1 Thai. However, there has never been any research on this topic conducted using the usage-based theory in the L1 Thai context. This research filled the gap by exploring the role of frequency on the acquisition of L2 English infinitive and gerund complements by L1 Thai learners from the usage-based point of view.

Methodology

Population and sample

The participants were first-year undergraduate Thai students at Chulalongkorn University. They were chosen and categorized into a low- and high- proficiency group based on their CU-TEP scores. The low proficiency group consisted of 30 students with a CU-TEP score of 45 – 56 (Middle-Intermediate Level). The high proficiency group consisted of 30 students with a CU-TEP score of 80 – 91 (Middle-Advanced Level). These groups were selected to compare and contrast the acquisition order of the English language features under consideration. Participants had to meet the following requirements. First, they must be freshmen undergraduates and native Thai speakers. Second, their CU-TEP score must be in the range of 45-56 (Middle Intermediate Level), or 80-91 (Middle Advanced Level). Third, they must have studied English for at least 12 years in accordance with the government's compulsory education policy in normal Thai schools, where Thai is the medium of instruction. Furthermore, they must not have come from Thai schools with an English Program (EP), or Intensive English Program (IEP), or from international schools where English is the primary medium of

instruction. Finally, they must not have lived or studied in any English-speaking country for more than three consecutive months.

Production processes for research instruments

A reasonable benchmark was needed to identify the level of verbs to be used for the task production. A comparison was made of the CU-TEP score, the TOEFL Paper Based score and the CEFR. It was assumed that low and high proficiency participants were nearly equivalent to the B1 and C1 level, respectively, and that participants would have some knowledge of the verbs on the A1 – B1 levels of the CEFR. To make the variable constant, all verbs used in the complementation position were also in the same range as A1 – B1 levels. In addition, all the targeted test items were written in the past tense. Later, the list of verbs within the scope was taken from English Vocabulary Profile established by Cambridge University Press. All the verbs in the list were manually checked with reliable dictionaries as to whether they were followed immediately by infinitive or gerund complements. Verbs with more than one meaning that could be followed immediately by infinitive complements or gerund complements (e.g. ‘fail’ or ‘admit’), and verbs followed immediately by infinitive complements or gerund complements that occurred as a part of phrases or idioms (e.g. ‘learn to live with something’ or ‘keep going’) were excluded from the list, because different meanings of verbs and the specific structure of phrases or idioms might affect the frequency results counted from the corpus. After the checking process, each verb remaining in the list was put into the corpus data search to see its frequency of occurrence in the target complement construction(s). It was initially decided that the frequency of each verb occurring in the target complement construction would be counted only from the first 200 random concordance lines because the whole corpus appeared to be very large. Also, since the BNC was the corpus of the native speakers, it was carefully selected to be a baseline as a criterion for usage of the two linguistic features.

As a result, from each complement construction, the first four verbs with the highest construction frequency, and the last four verbs with the lowest construction frequency counted from the 200 random concordance lines, were used to produce the tasks. There were a total of

eight verbs from each complement construction. All of the selected verbs are illustrated in Table 1.

Table 1: The list of verbs used in the task production

	Verb + To. Infinitive	Corpus Frequency	Verb + Gerund	Corpus Frequency
High Construction Frequency Verb	attempt	163/200	enjoy	22/200
	refuse	123/200	involve	19/200
	Appear	66/200	finish	16/200
	decide	64/200	dislike	15/200
Low Construction Frequency Verb	demand	14/200	recommend	7/200
	offer	14/200	postpone	6/200
	apply	5/200	suggest	4/200
	hurry	4/200	report	2/200

All the verbs were later randomly separated for the two tasks, namely, Word Selection Task (WST) and Grammaticality Judgement Test (GJT). The two tasks were inspected by three highly experienced linguists for grammaticality and appropriateness. These experts are linguists and English language teachers at the Faculty of Arts, Chulalongkorn University.

Research instruments

- ***Word Selection Task (WST)***

This task was designed to test the participants' ability to produce the L2 features under investigation: infinitive and gerund complements. The total number of the test items was 30, consisting of eight targeted test items and 22 distractors. Many distractors were incorporated into the tasks so that the participants would not be aware of the targeted test items. Furthermore, these eight test items could be divided into two equal groups in accordance with the two types of verb complement: four

items followed immediately by infinitive complements, and another four items followed immediately by gerund complements. Also, the other 22 distractors contained several grammatical features, such as singular and plural forms, pronouns, determiners, adjectives and adverbs. Each targeted test item was worth one point, so the full score for this task was eight. For this task, as the name implies, the participants were required to read each sentence carefully and circle the correct answer given in the parentheses, as in examples (1) and (2). Participants were asked to examine whether each targeted test item should be followed immediately by an infinitive complement or a gerund complement.

- (1) I really enjoyed **(to play/ playing)** tennis with my father.
- (2) Three prisoners attempted **(to escape/ escaping)** from the jail yesterday.

- ***Grammaticality Judgement Test (GJT)***

The GJT was used to examine the participants' underlying knowledge of infinitive complements and gerund complements. As in the previous task, the total number of test items was 30, consisting of eight targeted test items and 22 distractors. This task involved a different set of verbs that used in the previous task. In total, for two tasks, two sets of verbs were used. It was expected that having two different sets of verbs helped prevent participants from memorizing the answers and using their metalinguistic knowledge in completing the tasks.

The eight targeted test items were divided into two equal groups in accordance with the two types of verb complement: four items followed immediately by infinitive complements and another four items followed immediately by gerund complements. Among the four test items that could be followed immediately by infinitive complements, two items were written grammatically correct, while two other items were written grammatically incorrect. Similarly, among the four test items that could be followed immediately by gerund complements, two items were written grammatically correct, while two other items were written grammatically incorrect. In addition, various grammatical features, such as singular and plural forms, pronouns, determiners, adjectives and adverbs were used as distractors. For this task, participants were

asked to examine whether each item was grammatically correct as in examples (3), (4), (5) and (6).

- (3) I finished **to write** the report just minutes before it was due.
 () _____
- (4) Despite her baby face, she appeared **to be** in her late forties.
 () _____
- (5) I really disliked **being** away from my family. () _____
- (6) We decided **going** to Canada for our holidays. () _____

Participants were required to read each sentence carefully and determine if the underlined part of each sentence was correct. If it was grammatically correct, participants were required to put a tick mark (√) in the parentheses. If it was grammatically incorrect, participants were required to put a cross mark (x) in the parentheses and to correct the underlined part in the space provided as in the examples listed above. Each item was worth one point. The score was determined based on the criteria listed in Table 2.

Table 2: Scoring criteria for the Grammaticality Judgement Test

Scoring	Criteria
1 point	a correct judgement on a grammatically correct item.
1 point	a correct judgement on a grammatically incorrect item with a grammatically accurate correction
0 point	an incorrect judgement on a grammatically correct item
0 point	an incorrect judgement on a grammatically incorrect item.
0 point	a correct judgement on a grammatically incorrect item without any correction or with a grammatically inaccurate correction

For each item, participants received one point or none. They received one point for making a correct judgement on a grammatically correct item or making a correct judgement on a grammatically incorrect item with a grammatically accurate correction. Participants were scored based on these two criteria because it showed that they

had some knowledge of the linguistic features under investigation. If participants made a correct judgement on a grammatically incorrect item, but could not provide a grammatically accurate correction, they did not receive any score since it suggested they did not really understand the language feature.

Data collection

Data collection was done in two phases. Data were collected, for the pilot study during the second semester of the 2016 academic year, and for the main study during the summer session of the 2016 academic year. All participants in two phases met the requirements described in the section on Population and Sample. Each proficiency group consisted of 30 participants. There were a total of 60 participants.

Data analysis

The 16 target test items from two tasks, of interest to the study, were checked with an answer key. After the checking process, all answers were analyzed quantitatively using descriptive statistics.

Results and Discussions

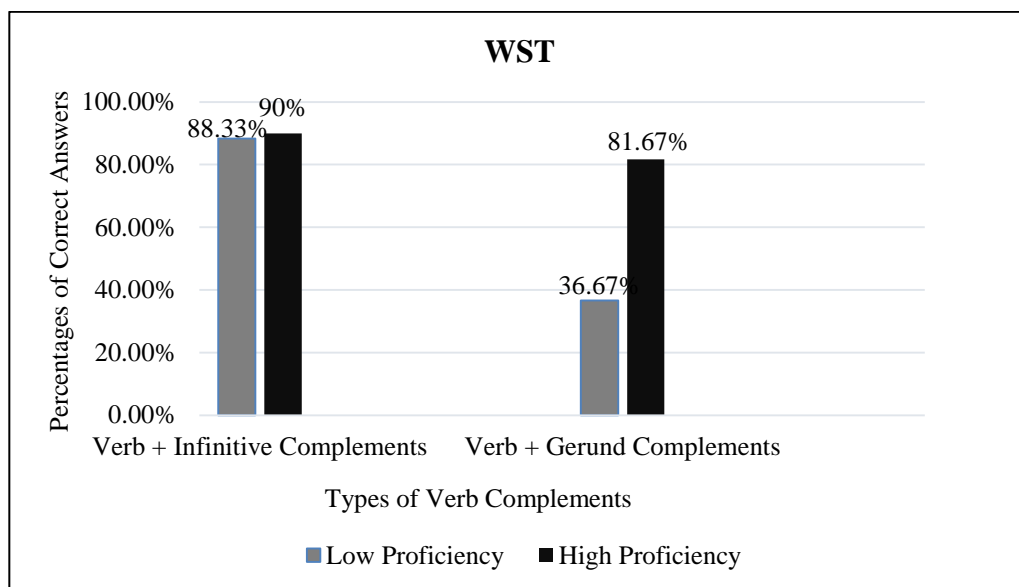
Results and discussions of Hypothesis 1

To test this hypothesis, total scores, percentages, mean scores and standard deviations of correct answers, from the WST and the GJT completed by two groups of participants were compared.

Table 3: Results obtained from the low and high proficiency groups showing correct answers on the WST

		WST (Task 1)							
Proficiency Level	No.	Verb +Infinitive Complements				Verb +Gerund Complements			
		Total	%	Mean	SD	Total	%	Mean	SD
Low Proficiency	30	106/120	88.33%	3.53	0.73	44/120	36.67%	1.46	1.13
High Proficiency	30	108/120	90%	3.6	0.56	98/120	81.67%	3.26	0.69

Figure 1: Results obtained from the low and high proficiency groups showing correct answers on the WST

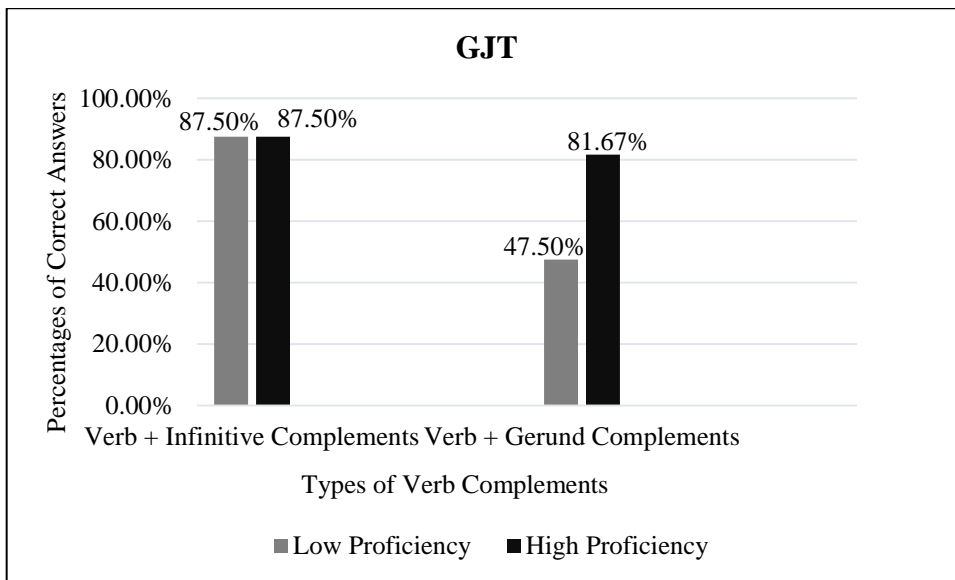


For the WST, the data in Table 3 and Figure 1 showed that both groups did better in infinitive complements (low proficiency group: 106 out of 120 or 88.33%; high proficiency group: 108 out of 120 or 90%) than gerund complements (low proficiency group: 44 out of 120 or 36.67%; high proficiency group: 98 out of 120 or 81.67%). On gerund complements, the high proficiency group (81.67%) outperformed the low proficiency group (36.67%).

Table 4: Results obtained from the low and high proficiency groups showing correct answers on the GJT

GJT (Task 2)									
Proficiency Level	No .	Verb +Infinitive Complements				Verb +Gerund Complements			
		Total	%	Mean	SD	Total	%	Mean	SD
Low Proficiency	30	105/120	87.50%	3.5	0.68	57/120	47.50%	1.9	1.12
High Proficiency	30	105/120	87.50%	3.5	0.57	98/120	81.67%	3.26	0.69

Figure 2: Results obtained from the low and high proficiency groups showing correct answers on the GJT



Similarly, for the GJT, the data in Table 4 and Figure 2 revealed that both groups were better using infinitive complements (low proficiency group: 105 out of 120 or 87.50%; high proficiency group: 105 out of 120 or 87.50%) than gerund complements (low proficiency group: 57 out of 120 or 47.50%; high proficiency group: 98 out of 120 or 81.67%). The high proficiency group (81.67%) also outperformed the low proficiency group (47.50%) on gerund complements.

Both groups were more accurate using infinitive complements than gerund complements. Also, the low proficiency group tended to use infinitive complements when gerund complements were required. Apart from using two targeted linguistic features interchangeably, a few wrong involved incorrect use of the base forms of verbs. The accurate use of gerund complements also increased with proficiency level, suggesting that L1 Thai learners acquired infinitive complements before gerund complements. This can be explained by the usage-based theory, particularly, the concept of type frequency. According to this theory, linguistic knowledge is remarkably influenced by language use (Bybee & Beckner, 2009; Croft & Cruse, 2004). Linguistic knowledge emerges out of language use, and not strictly due to innate ability (Bybee & Beckner, 2009; Croft & Cruse, 2004). Hence, in order to form strong cognitive or abstract representations of linguistic knowledge in mind,

having repeated experiences of particular linguistic elements are essential (Bybee, 2010; Bybee & Thompson, 1997). Following the concept of type frequency, infinitive complements are considered a high type frequency construction, whereas gerund complements are considered a low type frequency construction (Almulla, 2015; Schwartz & Causarano, 2007). The frequency with which L2 learners have been exposed to can facilitate their SLA (Ellis, 2002). Once the abstract representations of linguistic knowledge or constructional schemas are established, they will function as templates for the creation and interpretation of new expressions (Langacker, 2008). In conclusion, the linguistic feature with a high type frequency, namely, infinitive complements, will help ensure that the specific construction will be used frequently, leading to the strengthening of its abstract representation and making it more accessible for future use as well as making it much easier to extend the usage of the construction to new items and vice versa for the linguistic feature with a low type frequency (Bybee & Thompson, 1997). As a result, the first research hypothesis was confirmed. The results of this study were also in line with those in Almulla (2015), Samana (2005) and Schwartz and Causarano (2007)

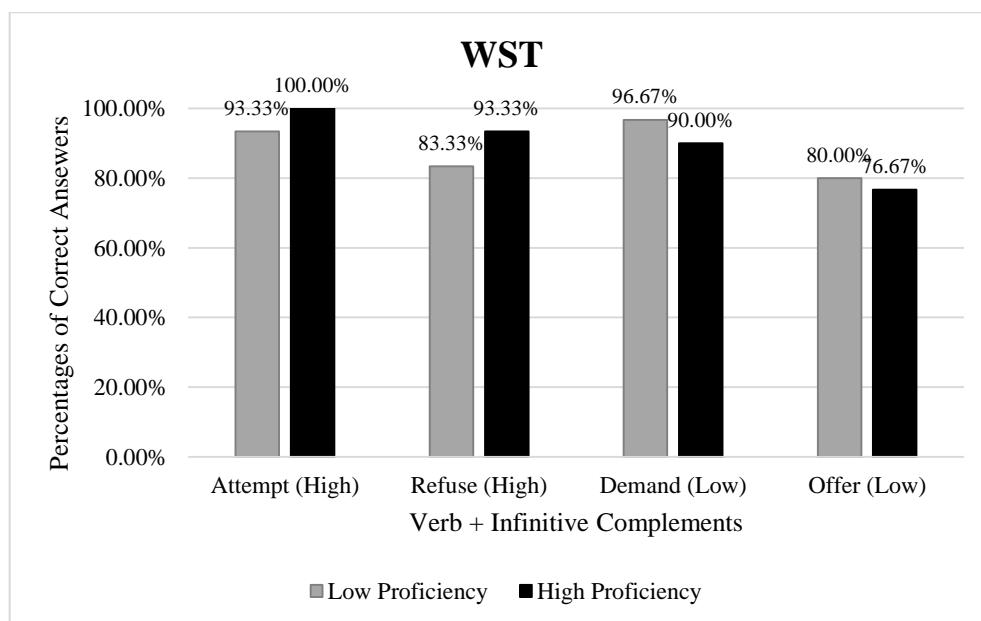
Results and discussions of Hypothesis 2

To test this hypothesis, percentages and total scores of correct answers of verbs on the WST and the GJT from both groups of participants were compared with the frequency of verbs, occurring in the targeted complement construction (i.e. the infinitive or the gerund complement construction).

Table 5: WST results obtained from the low and the high proficiency groups on verbs followed immediately by infinitive complements

Verb +Infinitive Complements	WST (Task 1)					
	Raw Corpus		Low		High	
	Frequency (BNC)		Proficiency		Proficiency	
	Total	%	Total	%	Total	%
Attempt (High)	163/200	81.50%	28	93.33%	30	100%
Refuse (High)	123/200	61.50%	25	83.33%	28	93.33%
Demand (Low)	14/200	7%	29	96.67%	27	90%
Offer (Low)	14/200	7%	24	80%	23	76.67%

Figure 3: WST results obtained from the low and the high proficiency groups on verbs followed immediately by infinitive complements

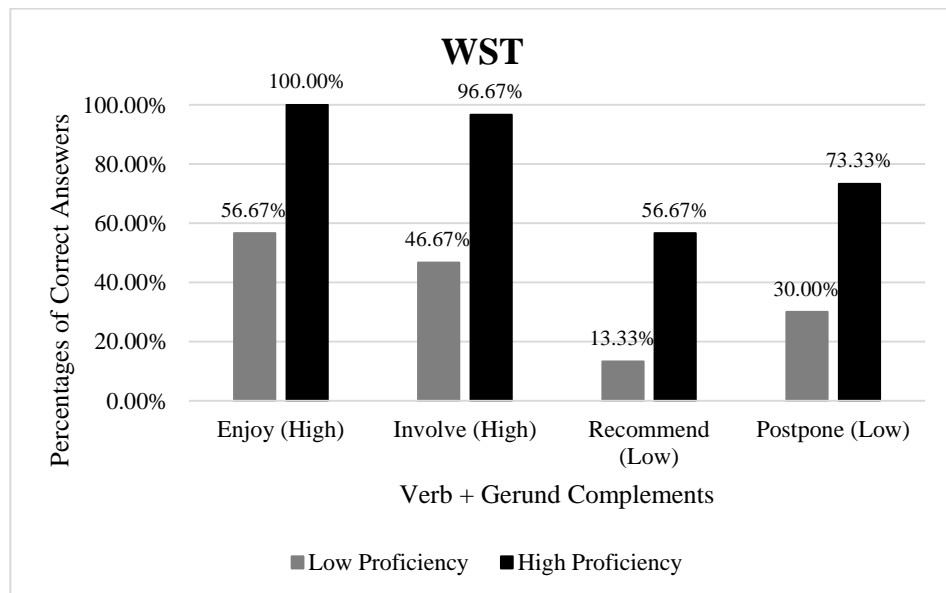


As illustrated in Table 5 and Figure 3, the percentages of correct answers, on the WST from the low proficiency group, on verbs followed immediately by infinitive complements did not align with the frequency of verbs occurring in the infinitive complement construction. For example, only 83.33% of the low proficiency group (25 participants) could correctly answer the verb ‘refuse’, which was categorized as a high frequency verb, but 96.67% of the same group (29 participants) could answer the verb ‘demand’ correctly, which was categorized as a low frequency verb. The data showed the opposite for the high proficiency group. The percentages of correct answers, on the WST from the high proficiency group, on verbs followed immediately by infinitive complements were relatively in the same direction as the frequency of verbs occurring in the construction. Test items with high frequency verbs were answered correctly more often than those with low frequency verbs.

Table 6: WST results obtained from the low and the high proficiency groups on verbs followed immediately by gerund complements

WST (Task 1)						
Verb +Gerund Complements	Raw Corpus		Low		High	
	Frequency (BNC)		Proficiency		Proficiency	
	Total	%	Total	%	Total	%
Enjoy (High)	22/200	11%	17	56.67%	30	100%
Involve (High)	19/200	9.50%	14	46.67%	29	96.67%
Recommend (Low)	7/200	3.50%	4	13.33%	17	56.67%
Postpone (Low)	6/200	3%	9	30%	22	73.33%

Figure 4: WST results obtained from the low and the high proficiency groups on verbs followed immediately by gerund complements



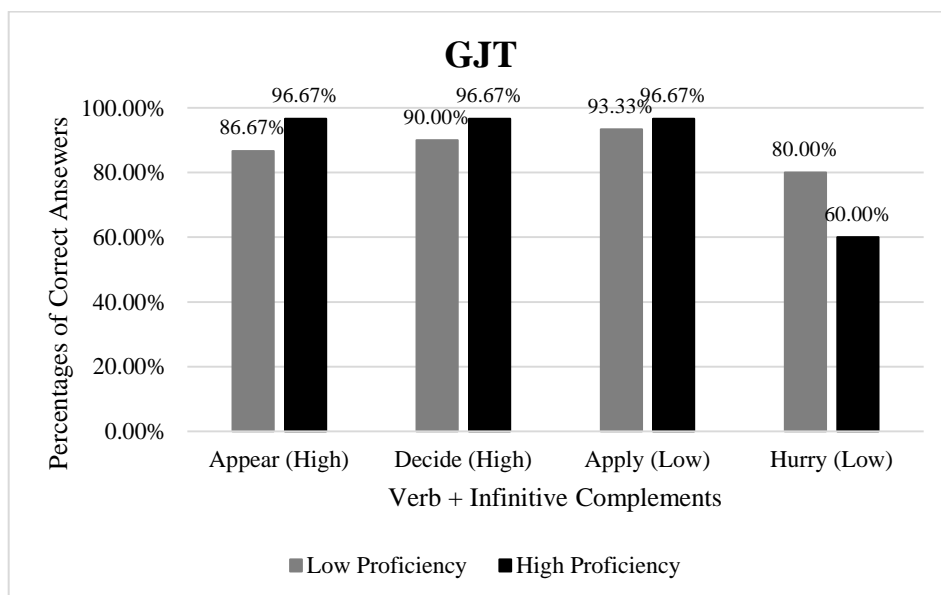
As shown in Table 6 and Figure 4, the percentages of correct answers, on the WST from both groups, on verbs followed immediately by gerund complements seemed to coordinate with the frequency of verbs occurring in the gerund complement construction. To put it simply, high frequency verbs were answered more correctly than low frequency verbs. Still, the anomaly, consisting of the verb ‘postpone’ and the verb ‘recommend’ which were both classified as low frequency verbs, could be noticed. While the percentages of correct answers on the

verb 'postpone' from the low and the high proficiency groups were 30% (9 participants) and 73.33% (22 participants), respectively, the percentages of correct answers on the verb 'recommend' from both groups were 13.33% (4 participants) and 56.67% (17 participants).

Table 7: GJT results obtained from the low and the high proficiency groups on verbs followed immediately by infinitive complements

GJT (Task 2)						
Verb +Infinitive Complements	Raw Corpus		Low		High	
	Frequency (BNC)		Proficiency		Proficiency	
	Total	%	Total	%	Total	%
Appear (High)	66/200	33%	26	86.67%	29	96.67%
Decide (High)	64/200	32%	27	90%	29	96.67%
Apply (High)	5/200	2.50%	28	93.33%	29	96.67%
Hurry (High)	4/200	2%	24	80%	18	60%

Figure 5: GJT results obtained from the low and the high proficiency groups on verbs followed immediately by infinitive complements



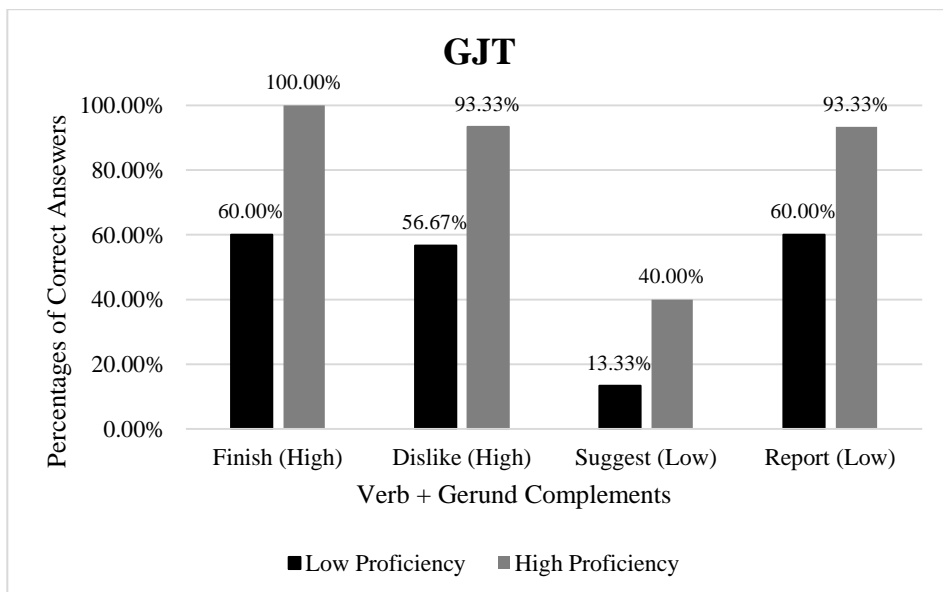
As illustrated in Table 7 and Figure 5, the percentages of correct answers, on the GJT from both groups, on verbs followed immediately by infinitive complements were not in the same direction as the

frequency of verbs occurring in the infinitive complement construction. For example, only 86.67% of the low proficiency group (26 participants) could answer the test item with the high frequency verb ‘appear’. In contrast, approximately 93.33% of the low proficiency group (28 participants) could answer the test item with the low frequency verb ‘apply’. In addition, test items these two verbs were each answered correctly by 96.67% of the high proficiency group (29 participants).

Table 8: GJT results obtained from the low and the high proficiency groups on verbs followed immediately by gerund complements

GJT (Task 2)						
Verb +Gerund Complements	Raw Corpus		Low		High	
	Frequency (BNC)		Proficiency		Proficiency	
	Total	%	Total	%	Total	%
Finish (High)	16/200	8%	18	60%	30	100%
Dislike (High)	15/200	7.50%	17	56.67%	28	93.33%
Suggest (Low)	4/200	2%	4	13.33%	12	40%
Report (Low)	2/200	1%	18	60%	28	93.33%

Figure 6: GJT results obtained from the low and the high proficiency groups on verbs followed immediately by gerund complements



As shown in Table 8 and Figure 6, the percentages of correct answers, on the GJT from both groups, on verbs followed immediately by gerund complements did not parallel with the frequency of verbs occurring in the gerund complement construction. For example, the verb ‘finish’, a high frequency verb, and the verb ‘report’, a low frequency verb, each were answered correctly by 60% of the low proficiency group (18 participants). Similarly, the verb ‘dislike’, a high frequency verb, and the verb ‘report’, a low frequency verb, each were answered correctly by 93.33% of the high proficiency group (28 participants).

Constructional schemas are generally referred to as abstract representations of complex constructions (Dabrowska, 2004). Moreover, the constructional schemas themselves can be represented in various levels of abstraction, namely, high-level and low-level constructional schemas (Dabrowska, 2004; Langacker, 2008). High-level constructional schemas represent abstract representations of general patterns of complex constructions, the equivalent of general rules. On the other hand, low-level constructional schemas represent a lesser degree of abstractness. They are more lexically specific than the abstract representations of general patterns (Dabrowska, 2004; Langacker, 2008). Furthermore, these internal patterns are also represented in the same format as their instantiations, that is, actual expressions of the language use (Dabrowska, 2004). Therefore, high-level constructional schemas of the infinitive complement construction and the gerund complement construction can be represented as [VERB + TO. INFINITIVE] and [VERB + GERUND], respectively (Dabrowska, 2004). Conversely, low-level constructional schemas of the infinitive complement construction and the gerund complement construction can be represented as [ATTEMPT + TO. INFINITIVE] or [APPEAR + TO. INFINITIVE] and [ENJOY + GERUND] or [FINISH + GERUND], respectively, depending on entrenchment due to actual language use (Dabrowska, 2004; Langacker, 2008). In addition, there seems to be a relationship among instantiations or actual expressions of language use, high-level constructional schemas and low-level constructional schemas (Dabrowska, 2004; Langacker, 2008).

Based on the usage-based theory, acquisition of linguistic knowledge is driven by language use (Bybee & Beckner, 2009; Croft &

Cruse, 2004). The frequent use of particular linguistic elements can also lead to the formation of strong abstract representations in mind (Bybee, 2010; Bybee & Thompson, 1997). Once established, these abstract representations function as templates for new expressions (Langacker, 2008). Hence, the second research hypothesis explored the relationship between instantiations or actual expressions of language use and their corresponding low-level constructional schemas, with respect to frequency of use. The second hypothesis investigated the effect of the frequency with which verbs occurred in two targeted constructions on the entrenchment of learners' low-level constructional schemas (i.e. the abstract representations which are lexically specific) by looking at the learners' production. It was assumed that verbs occurring with high frequency would be answered correctly more often than those occurring with low frequency because the more frequently learners experience the language, the stronger their abstract representations will be and, presumably this would affect their production. It was assumed that the case would be the reverse for verbs with a low frequency of occurrence.

Discussions of the second hypothesis are separated into two parts: one for the low proficiency group and the other for the high proficiency group.

Regarding the low proficiency group, the percentages of correct answers on the WST and the GJT for verbs followed by infinitive complements (see Figures 3 and 5) did not align with the frequency of verbs occurring in the infinitive complement construction. Participants scored as well, or even higher on some low frequency verbs as they did on high frequency verbs. Also, the percentages of correct answers on the GJT for verbs followed by gerund complements (see Figure 6) did not coordinate with the frequency of verbs occurring in the gerund complement construction. By contrast, the percentages of correct answers on the WST for verbs followed by gerund complements (see Figure 4) appeared to align with the frequency of verbs occurring in the gerund complement construction, meaning, test items with high frequency verbs were answered correctly more often than those with low frequency verbs. Consequently, for the low proficiency group on the WST, only with respect to verbs followed by gerund complements did

the frequency of verbs occurring in the construction align with correct answers on the test (see Figure 4).

Overall, each verb followed by an infinitive complement was answered correctly by over 80% participants, whereas each verb followed by a gerund complement was answered less correctly than those followed by infinitive complements. Also, it appeared that the low proficiency group tended to use or select infinitive complements even in grammatical contexts where a gerund complement was required, leading to high percentages of correct answers on verbs followed by infinitive complements and low percentages of correct answers on verbs followed by gerund complements. The low proficiency group, that is, mostly answered correctly test items with verbs requiring infinitive complements, but they also answered test items requiring gerund complements, with infinitive complements. This could be explained by the strong influence of the high-level constructional schema of the infinitive complement construction in the learners' mind. Based on the concept of type frequency, infinitive complements are considered a high type frequency construction, whereas gerund complements are considered a low type frequency construction (Almulla, 2015; Schwartz & Causarano, 2007). By having high type frequency, that particular construction will be used frequently and extended to new lexical items, leading to the entrenchment of its corresponding high-level constructional schema (Bybee & Thompson, 1997). The results from the low proficiency group confirmed the first research hypothesis that Thai learners acquired infinitive complements before gerund complements. In addition, the results suggested that the low proficiency group was still remarkably influenced by the high-level constructional schema, but not by the low-level constructional schema.

With respect to the high proficiency group, the percentages of correct answers on the WST, covering verbs followed by infinitive complements and gerund complements, aligned with the frequency of verbs occurring in two targeted complement constructions (see Figures 3 and 4). In other words, test items with high frequency verbs were answered correctly more often than those with low frequency verbs. The results showed that the high proficiency group had acquired both, the high-level and the low-level constructional schemas. Conversely, the percentages of correct answers on the GJT, covering verbs followed by

infinitive complements and gerund complements, did not align with the frequency of verbs occurring in two targeted complement constructions (see Figures 5 and 6). In other words, participants scored as well, or even higher on some low frequency verbs as on high frequency verbs. In summary, for the high proficiency group on the WST, the percentages of correct answers aligned with the frequency of occurrence. The results from GJT showed some consistencies. One explanation could be that the frequency of the target verbs occurring in the target complement constructions for this study was counted from the first 200 random concordance lines from BNC (Lancaster), the frequency of the verbs, used to categorize verbs into high frequency and low frequency, may not actually be distinct enough from one another. For example, for gerund complements on GJT, while the verbs 'finish' and 'dislike' with the frequency of occurrence 16 out of 200 and 15 out of 200, respectively, were considered as high frequency verbs for this study, the verbs 'suggest' and 'report' with the frequency of occurrence 4 out of 200 and 2 out of 200, respectively, were considered low frequency verbs.

The results suggested that the frequency of verbs occurring in targeted complement constructions probably contributed to the entrenchment of learners' low-level constructional schemas and their language use. As a result, the second hypothesis was partially confirmed. Last but not least, the low-level constructional schema seems to have been established in the learners' mind after the high-level constructional schema and the low-level constructional schema are established when the learners' cognitive representation had reached a higher level.

Conclusions

The results indicated that L1 Thai learners acquired the infinitive complements before the gerund complements and this phenomenon of language could be explained by the usage-based theory, specifically, the concept of type frequency. Also, the frequency of verbs occurring in the target complement constructions probably contributed to the entrenchment of the learners' low-level constructional schemas and their language use.

Pedagogical implications

This study's findings on the acquisition of English infinitive and gerund complements, may help English language teachers design and develop teaching materials and methods for these two language features. Perceptive and productive (including oral and written) exercises concerning the actual usage of the infinitive and the gerund complements should be designed and assigned to learners. Perceptive tasks such as reading texts, news passages, and audio conversations, filled with the targeted linguistic features, should be given to learners first. After these perceptive tasks have become familiar, production tasks such as writing assignments, group presentations, and role plays, requiring the use of linguistic features, should be introduced. With respect to the usage-based theory, it is possible that the more frequently learners experience the targeted language structures, the stronger the corresponding abstract representations in their mind become, and the easier the activation of those language structures for their future use will be.

Limitations of the study and recommendations for future studies

The following are limitations of the current study and recommendations for future studies.

- (1) The research instruments used in this study were WST and GJT. Since they were relatively controlled elicitation tasks, future studies should employ a wider range of task types, including spontaneous and natural production tasks, so that the results show a clearer picture of the learners' behavior.
- (2) Future studies should include all kinds of verbs with verbal complements, namely, verbs followed immediately by infinitive complements (e.g. 'attempt' and 'refuse'), verbs followed immediately by gerund complements (e.g. 'enjoy' and 'finish') and verbs followed immediately by both infinitive and gerund complements (e.g. 'cease' and 'intend').
- (3) As discussed in the section on Methodology, since the frequency of verbs occurring in the target complement construction for this study was manually counted from the first 200 random concordance lines from BNC, the frequency of verbs, used to

classify verbs as high frequency or low frequency, may not have made a clear enough distinction between the two groups, leading to the partially confirmed results. Consequently, future studies should apply a wider scope of corpus frequency, for example 500 – 1,000 random concordance line, so that the results will be more generalized. In addition to the use of BNC, American corpora, such as COCA or some corpora of other Englishes should be incorporated in future studies.

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