การศึกษาการรับรู้และการลงเสียงหนักระดับคำภาษาอังกฤษ ของนักศึกษามหาวิทยาลัยชาวไทย

The Study of Recognition and Production of English Word Stress of Thai University Students

SUTHIDA SOONTORNWIPAT

THIS RESEARCH PROJECT WAS FINANCIALLY SUPPORTED
BY HUACHIEW CHALERMPRAKIET UNIVERSITY
YEAR 2021

ชื่อเรื่อง การศึกษาการรับรู้และการลงเสียงหนักระดับคำภาษาอังกฤษของนักศึกษามหาวิทยาลัยชาวไทย

ผู้วิจัย สุธิดา สุนทรวิภาต

สถาบัน มหาวิทยาลัยหัวเฉียวเฉลิมพระเกียรติ

ปีที่พิมพ์ 2564

สถานที่พิมพ์ มหาวิทยาลัยหัวเฉียวเฉลิมพระเกียรติ

แหล่งที่เก็บรายงานฉบับสมบูรณ์ มหาวิทยาลัยหัวเฉียวเฉลิมพระเกียรติ

จำนวนหน้างานวิจัย 85 หน้า

คำสำคัญ พยางค์ การรับรู้ การลงเสียงหนักระดับคำ

ลิขสิทธิ์ มหาวิทยาลัยหัวเฉียวเฉลิมพระเกียรติ

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาว่านักศึกษาวิชาเอกภาษาอังกฤษสามารถใส่เครื่องหมายระบุเสียงหนักในคำสองพยางค์ สามพยางค์ และสี่พยางค์ในภาษาอังกฤษได้อย่างถูกต้อง และยังศึกษาความสัมพันธ์ระหว่างความสามารถในการระบุเสียงหนักกับความสามารถในการออกเสียงหนักในคำสองพยางค์ สามพยางค์ และสี่พยางค์ในภาษาอังกฤษ รวมถึงปัจจัยที่มีผลต่อการลงเสียงหนักไม่ถูกต้อง ผู้เข้าร่วมงานวิจัยเป็นนักศึกษาเอกวิชาภาษาอังกฤษชั้นปีที่ 2 มหาวิทยาลัยหัวเฉียวเฉลิมพระเกียรติ ที่ลงทะเบียนรายวิชาภาษาศาสตร์ภาษาอังกฤษ 2 จำนวน 14 คน เก็บข้อมูลจากการใส่เครื่องหมายระบุเสียงหนักในคำสองพยางค์ สามพยางค์ และสี่พยางค์ในภาษาอังกฤษ รวม 45 คำ และจากการอ่านรายการคำทั้ง 45 คำ

ผลการศึกษาพบว่านักศึกษาส่วนใหญ่สามารถใส่เครื่องหมายระบุเสียงหนักในคำสองพยางค์ สามพยางค์ และสี่พยางค์ในภาษาอังกฤษได้อย่างถูกต้อง จากการศึกษาพบว่าการลงเสียงหนักในคำสองพยางค์ สามพยางค์ และสี่พยางค์ในภาษาอังกฤษ จำนวนมากกว่าร้อยละ 70 ถูกต้อง เช่นเดียวกับการออกเสียงหนักคำสองพยางค์ สามพยางค์ และสี่พยางค์ในภาษาอังกฤษ จำนวนมากกว่าร้อยละ 70 ถูกต้อง ซึ่งแสดงให้เห็นว่าความสามารถในการระบุเสียงหนักและออกเสียงหนักมีความสัมพันธ์กัน สำหรับปัจจัยที่มีผลกระทบต่อการระบุเสียงหนักและลงเสียงหนักไม่ถูกต้อง ได้แก่ ความแตกต่างระหว่างภาษาไทยและภาษาอังกฤษ ความซับซ้อนของพยางค์ และความรู้เกี่ยวกับโครงสร้างพยางค์ภาษาอังกฤษ

Research Title The Study of Recognition and Production of English Word Stress of Thai University Students

Researcher Suthida Soontornwipat

Institution Huachiew Chalermprakiet University

Year of Publication 2021

Publisher Huachiew Chalermprakiet University

Sources Huachiew Chalermprakiet University

No. of pages 85 pages

Keywords syllable, stress recognition, stress production

Abstract

The objectives of this study were to find out whether English major students are able to assign word stress to two-syllable, three-syllable and four-syllable English words correctly, whether there is a statistically significant correlation between their competence in recognizing and in producing English word stress, and to find out what factors affect the word stress errors. The participants of this study were 14 second year English major students studying EG 2503 English Linguistics 2 course at Huachiew Chalermprakiet University in academic year 2020. The data were collected by using a word stress assignment which comprised of a list of 45 common words.The participants were assigned to mark the primary stress on 45 words, and read all of them.

The research results revealed that most of the students do not have much difficulty in assigning the word stress. Over 70% of the stress placements of two-syllable, three-syllable and four-syllable English words were correct. For the stress productions, it was found that over 70% of stress productions were correct. It can be assumed that the ability of the students to assign the primary stress to the two-syllable, three-syllable, and four-syllable words correlated with their ability to pronounce them. The differences between English and Thai, the complexity of the syllables, and the inadequate knowledge of syllable structure were the factors affecting,students',word,stress,errors.

ACKNOWLEDGEMENTS

I wish to express my gratitude to the following people who contributed to the completion of my research study. First, my profound appreciation goes to Huachiew Chalermprakiet University and the research committee of the Faculty of Liberal Arts for providing me with funding for this project.

My sincere thanks go to Assistant Professor Nick Soonthorndhai, the dean of the Faculty of Liberal Arts, for his encouragement and support. I also wish to thank all of the participants for their kind cooperation and willingness to take part in the study.

Finally, I would like to extend my thanks to my family, my friends, and colleagues for their kind assistance, encouragement, and endless support.

TABLE OF CONTENTS

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

TABLE OF CONTENTS (CONT.)

Page

Appendices

LIST OF TABLES

CHAPTER 1

INTRODUCTION

1.1 Background and Signification of the Research Problem

Intelligibility is considered the ultimate goal of communication. To communicate effectively with native English speakers or non- native speakers, pronunciation should be accurate enough to be always understood (Harmer, 1991). Fraser (2000) stated that EFL learners with proper pronunciation can easily make themselves understood even when they make some lexical or grammatical mistakes; however, those learners who can speak English correctly but pronounce unclearly may encounter problems when interacting with other non-native speakers or native speakers of English. To communicate effectively with native English speakers, pronunciation should be accurate enough to be always understood (Harmer, 1991). Pronunciation errors can lead to misunderstanding or cause difficulties for the person who is interpreting the message. Tuan (2018) mentioned that many EFL learners are often faced with some pronunciation problems when they speak English, one of them is the inaccurate production of lexical stress, especially their inability to produce stress contrasts of multisyllabic words. For Thai students, English speaking is considered the most difficult skill since English is not their native language and the English and Thai sound systems are different. In English, stress is significant because it differentiates the meanings of the words, whereas tone is significant in Thai. Isarankura (2018) mentioned that in Standard Thai, many linguists seem to agree that word-final position has the strongest stress. This means that in Thai words, stress is always placed on the last syllable, regardless of the number of syllables within a word. Because of the differences between the English and Thai word stress systems, English word stress is one of the main problems in the pronunciation of English among Thai learners. Since the stress in English words is not fixed,

Thai students often find it difficult to place stress on the right syllables of English polysyllabic words. So, incorrect stress placement is a common cause of intelligibility problems (Rogerson- Revell, 2012)

Ladefoged and Johnson (2011) expressed that stress is an important feature of utterances. It applies to individual vowels, consonants and whole syllables. A syllable or word is stressed when it is pronounced with more force than other syllables or words. Simultaneously, listeners can recognize that a stressed syllable in a word is louder, stronger, and slightly higher than the rest of the syllables or an unstressed syllable. Roach (2009) classified two aspects of English word stress; word stress perception and word stress production. In word stress production, the stressed syllable is pronounced longer in vowel duration, louder, and higher in pitch than unstressed syllables. For the perceptual point of view, one characteristic that all stressed syllables share in common is prominence.

Many previous research studies also showed that Thai students have difficulties with their speaking skills. The misplacement of word stress is one possible cause of the problems. To be able to communicate effectively and intelligibly in oral English, non-native speakers need to speak English with correct word stress placement in order to be understandable to other listeners (Morley 1989, cited in Murphy, 1991; Hedge, 2000; Jenkins, 2000). Moreover, Underhill (1994) stated that pronouncing words with correct sounds but incorrect stress placement are more difficult to grasp than words with the correct word stress, but incorrect sounds.

In English, word stress is one of the suprasegmental features, and every word must have a prominent stress. When listening to native speakers of English, we will find that some syllables of the utterances we hear are louder, longer in vowel duration or higher in pitch. For example, when we say the word “salad”, the first will be higher in pitch, longer in vowel duration, and louder than the second syllable. According to

Underhill (1994), some long polysyllabic words can have secondary stress. For example, when we say the word “examination” the primary stress falls on the fourth syllable, whereas the secondary stress falls on the second syllable. The placement of the primary stress in the word also helps determine the meanings and grammatical category of the word. For example, it can distinguish nouns from verbs, as in an object, and to object.

Jotikasathira (1999) classified three degrees of stress; primary, secondary, and weak stress and also stated that every word in English must have a primary stress. However, there are no fixed rules about the placement of stress but some observations can help identify the stress position. For example, disyllabic words having the same spelling may be used either as a noun or a verb. In most cases, the noun is stressed on the first syllable, and the verb is stressed on the second. For the word ‘present’, if the stress is on the first syllable (PREsent), it functions as a noun, but if the stress is on the second syllable (preSENT), it functions as a verb. So, acquiring word stress in English is problematic for Thai students because there are no exact rules to determine which syllable receives primary stress. This is in line with Jenkins (2009) stating that stress placement is the element causing most difficulty to L2 learners, and Bourjan (2003) pointed out that Thai students had problems with stress placement in their pronunciation of major categories of English words. However, to be able to communicate effectively and intelligibly in English speaking, non-native speakers of English need to be able to produce understandable sounds (Nipa, 2006). So, speaking English with correct word stress placement will be comprehensible to other competent listeners (Morley 1989, cited in Murphy, 1991; Hedge, 2000; Jenkins, 2000).

From the researcher’s teaching experience as an English teacher, word stress is one of the major problems in the English speaking of Thai learners because of the different stress patterns between English and Thai. Therefore, there are many studies focusing on English word stress. Most of the previous studies of word stress

focused on word stress production and the variables such as language proficiency,

gender, and L1 transfer that affected stress production (Khamkhein,2010; Isarankura, 2018; Jaiprasong and Pongpairoj, 2020).However, there are a few researches investigating the recognition of word stress and linguistic variables such as the complexity of the stress patterns and syllables. In order to fill the gaps, this study aims to investigate word stress recognition and production of two-syllable, three-syllable and four-syllable English words of second year students majoring in English at Huachiew Chalermprakiet University and also explore the factors affecting the word stress errors.

1.2 Research questions

1. To what extent can English major students assign stress to two-syllable, three-syllable and four-syllable English words correctly?

2. Is there a significant correlation between the learners'competence in recognizing and in producing stress of English words?

3. What are the factors affecting their word stress errors?

1.3 Objectives

The objectives of this study are to find out (1) whether English major students are able to assign word stress to two- syllable, three-syllable and four-syllable English words correctly, (2) whether there is a statistically significant correlation between their competence in recognizing and in producing English word stress, and (3) what factors affect the word stress errors.

1.4 Scope of the Research

The participants of this study are second year English major students at Huachiew Chalermprakiet University. The data collections are from two tasks. The first task is doing the word stress assignment which evaluates the students'stress recognition and the second task is reading the word list which evaluates their stress production.

1.5 Definition of Terms

For this study, the following are the working definitions:

1) Word stress refers to an emphasis that is given to a certain syllable in a word. The ways in which all the syllables are stressed in the word vary from primary stress, secondary stress, and unstressed syllables. This study focuses on the primary stress defined as the loudest or the strongest stress (Jotikasathira, 1999).

2) Word stress error is an error that occurs when a speaker does not give stress to the correct syllable in the target word.

3) English major students are students who study English as their major field.

4) Word stress recognition refers to the ability to recognize which syllable of a multisyllabic word has primary stress and word stress production refers to the ability to produce stressed syllables of multisyllabic words.

1.6 Hypothesis

The students can assign word stress to two- syllable, three-syllable and four-syllable English words correctly, and there is a statistically significant correlation between their competence in recognizing and in producing English word stress. The students will do the stress recognition task better than the stress production task. Moreover, the students will have difficulties in pronouncing word stress, especially with the three-syllable words and four-syllable words because of the complexity of the syllables and the differences of the stress patterns between English and Thai.

1.7 Expected Contributions

The acquisition of stress plays an important role in second language learning because incorrect stress assignment and production may lead to intelligibility problems and lead to communication breakdown. With a greater awareness of the English word stress problems Thai students face, appropriate teaching methods will be designed to help students improve their ability to perceive the stressed syllable of words and produce English words with correct stress placement in order to communicate in English more effectively.

CHAPTER 2

LITERATURE REVIEW

This chapter provides related theories; 1) contrastive analysis and 2) error analysis. Moreover, definition of stress, stress patterns in English, and stress patterns in Thai are described and previous studies concerning the English word stress production of Thai students are illustrated.

2.1 Contrastive Analysis

Contrastive analysis (CA) is an approach that attempts to predict the difficulties in second language learning. CA compares learners' first language and a target language by identifying their structural similarities and differences systematically. Lado (1957) claimed that contrastive analysis can predict areas and degrees of difficulty for the second language learner according to the degree of difference between the learner's L1 and L2. The greater differences between the two languages, the more difficult it will be to acquire of the target feature.

According to Richards and Schmidt (2010), CA proposed three primary assumptions. First, the major difficulties in language learning are caused by the learner's native language interference. Second, the difficulties can be predicted by a comparison between the two linguistic systems, i.e. the learner's language and the target language. The third assumption is the preparation of teaching materials. The assumptions describe language learning as a set of habits formation through imitation or reinforcement (Ellis, 1985). In other words, a learner imitates and repeats a certain behaviour until it becomes spontaneous and he is either rewarded or punished depending on his responses. So, language learning is considered a set of

habits. So when learning a language, the learner's successful responses are reinforced and then repeated to form a habit.

Accordingly, learning a second language means the formation of a new set of linguistic habits, and the difficulties that arise during the L2 learning process are the interference of the learner's well-formed first-language with the learning of the target language. It means the greater the differences between L1 and l2, the more errors are expected to occur in the learner's interlanguage. Gass and Selinker (2008) added that a language learner needs to merely learn the differences, and ignore the linguistic features that are similar because they are repetitive in both languages and therefore do not create any difficulties. This view shows the strong version of the CA perspective, which considers interference as the main cause of difficulty in learning a second language and the success of language teaching materials design which is based on the comparison between two languages. However, the weak version of CA begins with what learners do and attempts to account for the errors on the basis of native language (NL) and target language (TL) differences (Gass and Selinker, 2008). Because of the focus on L1 interference, the notion of transfer is classified into two types: positive transfer and negative transfer. Dulay, Burt and Krashen (1982, p. 97) define positive transfer as 'the use of the L1 structure in L2 performance automatically when the structures in L1 and L2 are the same, resulting in correct utterances. Therefore, positive transfer takes place when the native language shares some similar linguistic features with the target language. On the other hand, negative transfer or interference, results from the differences between the two language systems. Such differences make learning the target language difficult and increase the possibility of committing errors in the interlanguage of the learners.

As far as difficulty of prediction is concerned, Lado (1977) claimed that 'we can predict and describe the patterns that will cause difficulty in learning by comparing the language and the culture to be learned with native language and culture of the student systematically.'

Brown (2000, p. 209) suggested six possible levels of difficulty as follows.

Levels	Description
Level 0 Transfer	No difference between L1 and L2, and the learner can positively transfer some linguistic items from L1 to L2, e.g., sounds like/b/,/t/,/d/,/k/,/f/ can be found in Thai and English.
Level 1 Coalescence	Two items in L1 merged into one item in L2, e.g., French learners overlook the difference between teach and learn, and they use apprendre instead.
Level 2 Under-differentiation	An item in L1 does not exist in L2, e.g., the sounds /z/ and /v/ do not exist in Thai. Thus, Thai learners tend to avoid these sounds when practicing English.
Level 3 Reinterpretation	An existing item in L1 is given a new shape or distribution in L2, e.g., the /l/sound is heard at the initial position of a syllable in Thai; however, Thai speakers learning English need to learn the syllable final position of the /l / sound in English.
Level 4 Over-differentiation	A completely new item must be learnt in L2 because of little or no similarity to L1. Thai learners must learn the English phonemes such as /z/, /v/, /t∫/, /dʒ/.
Level 5 Split	Unlike coalescence, split represents an item in L1 becoming two or more in L2. Thai learners of English have to make a distinction between/∫/and /t∫/as in shoes and choose.

According to the levels of difficulty, the first level, 'Level 0', represents the positive transfer in which the linguistic items in the first language are identical to those in the target language. Thus, language learners have no difficulty while learning the target language because of zero interference. On the other hand, the fifth level 'split' represents the highest level of interference which requires a learner's

enormous effort while learning the second language due to the difficulty he encounters.

However, the claim that language learning is a set of habits formation developed by imitation, repetition and reinforcement was rejected. Some errors, according to Nemser (1971), Corder (1981), and James (2013), cannot be traced simply to the learner's first language. This was supported by Dulay and Burt (1974). They mentioned that, although many errors were committed by transferring first language habits, many more errors were not, and learners often contributed creatively to the process of learning. Only 5 % of the errors made by the students were due to their first language. According to Dulay et al. (1982, p.183), most of the errors that L2 learners made indicate that they are gradually building an L2 rule while they are learning a language. In other words, learners of foreign or second language are on stages of acquisition, and the nature of their errors differ from one development level to another. Additionally, CA is criticised for ignoring factors which may affect the actual learner's production, i.e. learning and communication strategies, overgeneralisation and so forth. In conclusion, it is clear that the CA approach has greatly contributed to the field of language pedagogy and has played a significant role in the preparation of language syllabi, textbooks and teaching resources, which help a learner overcome the difficulties encountered while learning a foreign/second language. Scholars' dissatisfaction with the CA approach has shifted their attention to a more effective and practical method of analysis, i.e. Error Analysis.

2.2 Error Analysis

During the 1970s, the use of CA to predict learning difficulties of L2 learners began to decline as researches showed that many L2 errors were not a result of interference, and L2 learners go through stages of acquisition which make their errors vary from one development level to another. Because of the weakness of the CA hypothesis, an alternative approach called "Error Analysis" was used to study

language learners' errors which would be theoretically justifiable and pedagogically effective
and practicable.

2.2.1 Significance of Learners' Errors

Coder (1981) highlighted the importance of learners' errors in three ways. First, errors show how far toward the goal learners have progressed and what remains for learners to learn. Second, errors are evidence showing how learners learned or acquired language, what strategies or procedures they use in language learning. Thirdly, errors can be regarded as a device that learners use in order to learn. So, making of errors is a strategy employed both by children acquiring their mother tongue and by those learning a second language.

Learners' errors were investigated for two main purposes, according to Dulay et al. (1982): 1) to provide researchers with information about the nature of language learning process and how interference occurs, and 2) to help teachers and curriculum designers determine the difficulties which make the learner unable to communicate effectively. Richards and Schmidt (2010) mentioned that the causes of a learner's errors and the difficulties he encounters while learning can be identified by EA. Furthermore, EA also tells us about the language learning strategies the students use while they learn a language. Sercombe (2000) also pointed out the importance of learners' errors because it helps researchers explore how students learn a language, and what level of proficiency they have reached. Recent researches on learners' errors conducted by El-Dakhs and Mitchell, (2011); Zawahreh, (2012); and Swalameh, (2013) view errors positively and strongly agree that learners' errors are extremely significant and fruitful because they help language researchers and teachers understand second language acquisition process and how it develops. From a pedagogical point of view, a language teacher who is aware of his students' repeated errors can successfully prevent their future occurrence. Thus, the teacher's awareness of learners' errors can facilitate his task while giving the lesson.

In the study of Error Analysis, Corder (1967) proposed five steps of error analysis: 1) selecting a corpus of language, 2) identifying errors in the corpus, 3) classifying the identified errors, 4) explaining the causes of the errors and 5) evaluating the errors. Richard et al. (2002) pointed out that EA aims to identify the strategies learners use in learning a language, to explain the causes of learners' errors, and to obtain information on common difficulties in language learning.

2.2.2 Classification of errors

For a linguistic explanation of errors, Corder (1973) stated that errors could linguistically be classified into four main categories: omission, addition, selection, and misordering. However, in terms of psycholinguistic explanation of L2 learners' errors the concept of intralingual errors and developmental errors were introduced. According to Richards (1974) intralingual errors are "the errors which affect the general characteristics of rule learning, such as faulty generalization, incomplete application of rule learning, and failure to learn conditions under which rules apply"while developmental errors "illustrate the learn attempting to build up hypotheses about the language from his limited knowledge of it in the class room or textbook." The intralingual and developmental errors were classified as follows:

1) Overgeneralization: Overgeneralization is the device of the use of previously learnt strategies of L2 in the acquisition of new L2 items.

2) Ignorance of rule restriction: Ignorance of rule restriction is the device of extending the rules to areas in which they do not apply.

3) Incomplete application of rules: Incomplete application of rules is the failure to learn a complete type of structures because there are simple ones that the learner finds communicative.

4) False concept hypothesized: False concept hypothesized refers to deviations that result from faulty comprehension of the L2 distinction.

James (2013) classified four categories of errors: interlingual, intralingual, communication-strategy, and induced errors. He explained interlingual errors as the errors influenced by mother-tongue (L1), whereas intralingual errors are the result of some factors related to the second language (L2), namely false analogy, misanalysis, incomplete rule application, exploiting redundancy, overlooking cooccurrence restrictions, hypercorrection or overuse, and overgeneralization/system-simplification.

2.2.3 Error Explanation

In second language acquisition or SLA, to explain the nature of errors is a fundamental issue. Ellis (1994) explained that learners' errors involve an attempt to establish the processes responsible for L2 acquisition and L2 learners' errors are classified as errors of performance and errors of competence. Figure 1 illustrates Ellis's explanation.

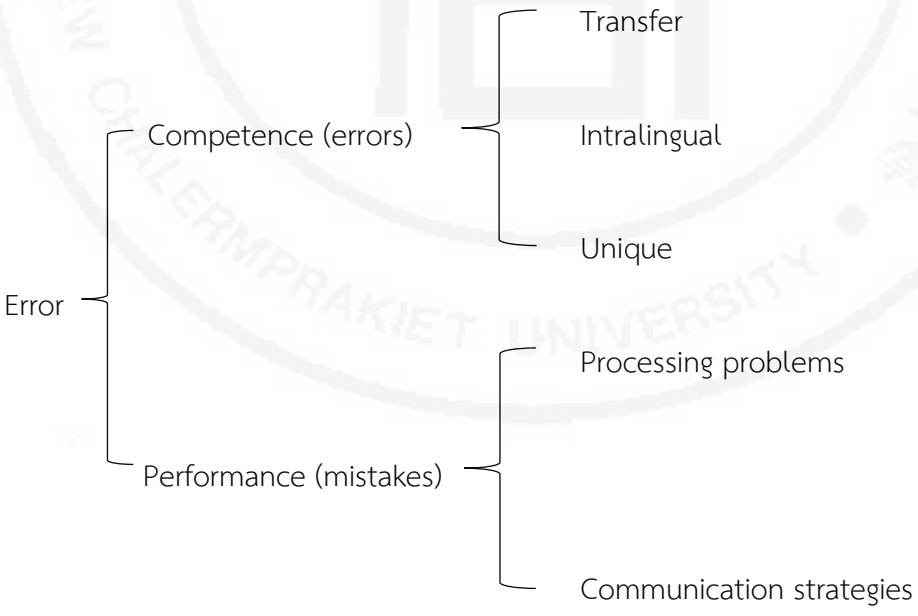

Figure 1: Psycholinguistic Sources of Errors (Ellis, 1994:58)

Figure 1 above shows that errors are classified into two types; the competence errors and the performance errors. The competence errors can be caused by applying the rules of the target language (TL) inaccurately whereas the performance errors are the result of committing mistakes repeatedly in the use of language. Generally, L2 learners' errors may be caused by different sources including the influence of L1 or the effect of the target language that might affect the process of second language learning. Analyzing L2 learners' errors, which includes identifying, describing, classifying and explaining them can be of much help to FL/L2 researchers, syllabus designers and EFL/ESL teachers. It can be concluded that exploring different sources of L2 errors is needed in order to understand the nature of the language being learned. EA theory can explain a variety of errors made by FL learners' errors, including syntactic, grammatical and phonological errors.

2.3 Stress in English and Thai

2.3.1 Definition of stress and Stress patterns in English

Stress is a supra-segmental phoneme which is significant in English. Roach (2000) mentioned that "stress" can be studied from the point of view of production which depends on the use of muscular energy, and the point of view of perception, all stressed syllables are prominent than unstressed syllables. He also explained that there are three levels of stress. Primary stress is the most prominent syllable. It refers to the strongest emphasis given to a syllable when spoken in isolation. Secondary stress gives emphasis to a lesser degree than that of the primary stress, but is still strong enough to constitute stressing. Unstressed is a third level of stress that refers to the lack of any amount prominence. In order to assign correct prominent stress, it is essential to consider 1) the complexity of the syllables, 2) the word class, 3) the number of syllables, and 4) the phonological structure of those syllables.

Word stress is described by Dalton and Seidlhofer (1994 cited in Plansangket, 2016) as the pattern of two types of syllables: stressed and unstressed syllables. They also claimed that incorrect accent decreases intelligibility and will result in misunderstandings. However, there are not any exact rules to identify which syllable

should receive primary stress, but the context can help determine which syllable should receive primary stress. Also, Rogerson-Revell (2012) mentioned that stress placement in English is variable, that is, the syllable or syllables that are stressed can vary depending on the structure and function of a word. For example, in the sentence "She is going to **present** a **present**", the two similar words are stressed differently. The first "present" is stressed on the second syllable because it functions as a verb, whereas the second "present" is stressed on the first syllable since it functions as a noun.

Celce-Murcia, Brinton, and Goodwin (1996: 133) stated that stress placement is related to the historical origin of a word, affixation, and the grammatical category of the word in an utterance. In English, the number of syllables, affixes, and/or the grammatical category of the word are believed to have a significant impact on word stress placement. So, within disyllabic or multisyllabic words, some syllables are pronounced louder and longer than others, and some syllables are stressed while others are not.

Although English lexical stress is not fixed, it is predictable in polysyllabic words, according to Kreidler (1997). He also stated that in order to decide on the position of stress in words, the following information is necessarily taken into account: the word class, the number of syllables in a word, the distinction between strong syllables and weak syllables, and the recognition of certain specific prefixes and suffixes. Pertaining to the stress position in English words, it can be the final syllable (i.e.,the ult), the second syllable from the end (i.e., the penult), third syllable from the end (i.e., the antepenult) and the fourth syllable from the end (i.e., pre-antepenult).

Jotikasathira (1999) defined stress as the loudness with which we pronounce a word or a syllable. When we speak, we pronounce some syllables louder than others. In English, there are at least three degrees of stress: *primary*, *secondary*, and *weak*. Primary stress is the strongest or the loudest stress. Every word in English must have

one primary stress. For example, when we say the word "sofa", the first syllable is pronounced louder than the second. Thus, the first syllable has primary stress.

The word *sofa* will look like this: *SOfa*. Secondary stress usually appears in words that have three or more syllables. A syllable with secondary stress is pronounced at normal

speaking level. Weak stress is pronounced with a low pitch, a little softer than normal speaking level. Weak stress is usually not marked at all. The second syllable of the word *sofa* has weak stress and the word *examiNAtion* is pronounced with weak stress on the first, the third and the last syllables. There are no exact rules for determining which syllable of a word should be stressed, but some of the following observations would be of help.

1) Nearly 75% of two-syllable words are stressed on the first syllable.

2) Disyllabic words, having the same spelling, may be used either as nouns or verbs. In most cases, the noun is stressed on the first syllable, the verb, on the second.

3) Words ending with the suffixes –oon, -eer, -ee, and –ette usually have primary stress on these suffixes:

4) Words ending with the suffixes –ic,-ious,-ual, -ion, -ity, -ian, -ify, graphy, and –logy normally have primary stress on the syllables before these suffixes.

Kanoksilapatham (2010) explained that each English word has only one stress on one of its syllables. For multisyllable words, the syllable with more prominence is called stress syllable and the less prominent one is referred to as unstressed syllable. According to Kanoksilapatham(2010) , stress is classified into three levels; primary stress, secondary stress, and unstressed syllable. She provides some generalizations regarding the placement of stress in English.

1) More than 80% of two syllable words receive primary stress on the first syllable if the word is a noun, and on the second syllable if the word is a verb.

2) The major stress falls on the first or second syllable of three syllable words.

3) The placement of primary stress is predictable in the words with the following suffixes.

- The suffixes indicating that syllable preceding them receives primary stress are -ial, -ian, -ible, ic, -ical,-ient, --ify, -(t)ion, -ior,-ious, -ish, -ity, -logy,-meter, -ive, -ual, and -wise.

- Some suffixes indicating that the second syllable preceding them receives primary stress are -ate, -cy,- ize,-phy, --try, -ee, and -eer.

- The suffix -able does not change the stress pattern of a word to which it is added.

- In compound words, the first component of the word receives primary stress, and the second component receives secondary stress.

Liu (2017) mentioned that in stress languages, there is usually one syllable in a word that is more salient than other syllables. He also pointed out that languages can be categorized into two groups: 'predictable stress languages' and 'non-predictable stress languages'. Stress shows different functions in different types of languages. In the first group, such as French or Finnish, the stressed syllable is regular and the stress position is predictable based on phonological characteristics of the word alone. In the second group, such as English and Spanish, primary stress is not fixed, and different placement of stress may result in difference in meaning or grammatical category of the word. For example, if the disyllabic words, having the same spelling, may be used either as nouns or verbs, the primary stress falls on the first syllable if it functions as a noun, but if it is a verb, the second syllable receives the primary stress. However, it doesn't mean the stress is randomly assigned, and the phonological characteristics of the word are not the only factor determining where the stress falls.

2.3.2 Stress Patterns in Thai

Naksakul (2002 cited in Jaiprsong and Pongpairoj, 2020) defined stress as the production of speech with a higher pitch and a longer duration. Stress manifested the prominent quality of a word (Luksaneeyanawin, 1983). In Thai, stress can be classified into two patterns: stressed and unstressed (Naksakul, 2002).

According to Warotamasikkhadit (2002 cited in Nipa, 2006), syllable structures play an important role in word stress in Thai. He classified syllable structures into three groups: monosyllabic words, disyllabic words, and polysyllabic words.He also explained the stress patterns of disyllabic and polysyllabic words as follows:

1) Two-syllable words

A. Unstressed-Stressed

In the unstressed-stressed pattern, the primary stressed syllable is the second syllable. The first syllable usually contains short vowels or long vowels without consonants at the end of the syllable.

B. Stressed-Stressed

In this pattern, the stress is put on both the first and the second syllable. The syllables in this pattern usually contain diphthongs or long vowels with consonants at the end.

2) Three-syllable words

A. Stressed-Unstressed-Stressed

The stress of the stressed-unstressed-stressed pattern is on the first and the last syllable. The second syllable of this pattern usually has a short vowel without consonants at the end.

B. Unstressed-Stressed- Stressed

The stress of this pattern is on the second and last syllables. The first syllable usually contains a short vowel or the first syllable begins with the vowel and the second syllable contains a short vowel.

3) Four-syllable words

A. Unstressed-Stressed-Unstressed-Stressed

In this pattern, the stress is put on the second and the last syllable. It is the most common pattern in four syllable words. The first and the third syllables contain short vowels without consonants at the end of them

B. Stressed-Unstressed-Unstressed-Stressed

The stress of this pattern is put on the first and the last syllable. The second and the third syllables contain the vowel /a/.

C. Stressed-Unstressed-Stressed-Stressed

The stress is put on the first, third, and the last syllables. The second syllable

usually contains a short vowel without consonants at the end of it.

D. Stressed- Stressed-Unstressed-Stressed

The stress in on the first, second and the last syllables. The third syllable of this pattern contains the vowel /a/.

Hiranburana (1972) mentioned that Thai word stress could not be explained by just a single rule because when the word occurs in isolation, the stress falls on the last syllable, but when it occurs in context, the stress will be shifted. For example, when the word /ro:ŋrian/ ("school" in English) is pronounced in isolation, the stress is automatically fell on the last syllable consistent with the Thai stress-pattern rule. When there is a context containing the word /ro:ŋrian/, the stress will be shifted. For example, in /dá:n pai ro:ŋrian/ (walk to school), the stress is shifted to the word "walk /dá:n/" because the action is stressed in this phrase according to sentence stress rules.

Swan and Smith (2001) stated that Thais speak English with Thai accent because they try to fit every English word into the Thai phonological system. Swan and Smith (2001) also explained that every syllable in Thai has a fixed tone. Thai gives equal weight and timing to each syllable, and that tonal pitch is located on single syllables which produces a rather staccato effect when transferred to English.

Thubthong, Kijsirikul, and Luksaneeyanawin (2010) mentioned that Thai is a fixed accent language. The last syllable of the word is accented and always perceived as a stressed syllable. Secondary accent is assigned according to the syllable structures. Secondary accents are realized as stressed syllables in formal speech, but as unstressed syllables in rapid conversation or casual speech.

Even though syllable stress occurs in Thai, it is not as significant a feature as in English. That means stress in Thai cannot help differentiate meanings of the words as it might do in English. It can be concluded that Thai is a tonal language with a fixed tone in each syllable, whereas English is a stressed-time language and the complexity of English stress rules may cause some difficulties for Thai students.

2.4 Previous studies concerning learner problems with the English word stress

Chuleethongrerk,S. (2006) investigated 68 Thai university students assigning primary stress to first-syllable-stressed and second-syllable-stressed disyllabic words in context and context free environments. The students were asked to complete two tasks; pronouncing 10 selected words which appeared frequently in their textbook, and reading a reading passage which contained those words. The study revealed that students assigned stress on second-syllable stressed disyllabic words more correctly than first-syllable-stressed disyllabic words. This result also suggested that students assign stress more correctly in context free settings.

Khamkhien (2010) studied Thai learners' English pronunciation competence. The study investigated Thai learners' knowledge about the word stress assignment and identified possible factors affecting the Thai learners' pronunciation competence. The findings demonstrated that majority of the Thai students lacked adequate English pronunciation skills. The word stress placement of 90 Thai participants was judged to be poor based on their scores. The most significant factor contributing to the participants' test scores was gender while faculty and years of studying English were not.

Watanapokapul (2010) conducted a study which aimed to explore the CU medical students in marking stress in English polysyllabic medical terms and the relationship between the ability to mark stress on English medical terms, and the ability to pronounce them. The results revealed that the students have difficulty in pronouncing polysyllable medical terms which may be caused by personal factors and linguistic features. The means scores of marking stress were slightly higher than those from pronouncing stress. This showed that there is a relationship between students' competence and performance.

Krajo (2016) investigated 30 university students' production of English word stress to see if English word stress placement was challenging for L2 learners and to look into the phonological elements that contributed to the issues. The capacity of L2 learners to produce stress varied, but three-syllable words were more difficult than two-syllable words, and the misplacement of stress was caused by the influence of vowel length and vowel height.

Plasangket (2016) explored the competence in word stress placement of EFL graduate students in Thailand, and investigated the factors affecting their stress placement errors. The participants were asked to complete an assignment test and a questionnaire regarding their attitude and motivation towards their pronunciation. The results revealed that students have limited competence to accurately assign primary stress on disyllabic pairs. The findings also suggested that lack of pronunciation learning experience, including phonetics, phonology and stress rules knowledge, is the important factor affecting student difficulties on the task.

Yangklang (2017) investigated the improvement of English word stress and intonation pronunciation of the first-year students at a university after using an e-learning program and also explored students' satisfaction with the e-learning program in order to improve stress and intonation pronunciation. The results revealed that the students improved their stress and intonation pronunciation by using the e-learning program, and they were also satisfied with the e-learning program in that it encouraged and motivated their pronunciation improvement.

Liu (2017) explored the production of word stress of 70 Chinese college students in their reading aloud. The students were asked to read about 600 words. Their readings were audiotaped and coded. The results showed that participants have difficulty in placing the stress to the right position in these 8 words: Pacific, geography, Seattle, concern, idea, somehow, somewhere, console. The frequency of 64 errors indicated that two-syllable words have the highest error rate, while three-syllable words have the second highest error rate. Learners' insensitivity to the syllable structure of English words and the lack of knowledge of English word stress are the causes of the problems.

Tuan (2018) conducted a study of Vietnamese learners' acquisition of word stress. This study aimed to investigate (1) whether Vietnamese learners were able to assign stress patterns in English multisyllabic words and (2) whether there was a significant correlation between the learners' competence in recognizing and in producing English lexical stress. The participants were 45 Elementary EFL learners. The researcher used word assignment tests, followed by a comparative analysis of the participants performance on the test and a retrospective interview. The results

revealed that overall level of competence in assigning stress in English words was above average, and the participants performed the recognition test better than they did with the production test. Moreover, there was a strong correlation between the participants' competence in recognizing and producing English lexical stress.

Weda (2018) explored the stress placement in English words of Indonesian learners of English studying English Literature Study Program. The participants were the students of English Literature Study Program. The results revealed that Indonesian learners were able to put the primary stress on monosyllabic words, two-syllable words, and three-syllable words easily, but were not able to put the stress on polysyllabic words with suffixes. It was also found that Indonesian learners tended to put the correct stress placement more on the reading test than on the written test.

Isarankura (2018) investigated the pronunciation of Thai students of English loanwords used in the Thai language. This study analyzed the extent to which tone assignment and the stress patterns in Thai affect the stress placement of English polysyllabic loanwords in the pronunciation of Thai students. Participants were 30 high and low proficiency English majors studying in a private university. The participants were assigned to read 30 English loanwords in isolation and in sentences. The findings revealed that the students transferred first language to the greatest extent when performing the oral reading of two-syllable loanwords in sentences. A small number of students placed stress wrongly on the final syllable of loanwords with three and four syllables,

Jaiprasong and Pongpairoj (2020) explored the production of English word stress of Thai students in two groups of English words – 1) English words with different suffixes: suffixes affecting stress shift, i.e. '-ic' (e.g. 'fantástic'), '-ity' (e.g. 'idéntity') and '-tion / -sion' (e.g. 'eléction') and suffixes demanding stress, i.e. '-oon' (e.g. 'typhóon'), '-eer' (e.g. mutinéer) and '-ee' (e.g. foresée) and 2) compound words: compound nouns (e.g. bédroom) and compound verbs (e.g. look fór). The participants were 10 intermediate learners and 10 advanced learners. They were asked to complete two production tasks: "Reading English Word Stress in Isolation" and "Reading English Word Stress in Sentences". The results revealed that the

advanced learners performed better English word stress production than the intermediate learners in both tasks. The errors found in this study were interlingual errors because the word stress assignment rules of English and Thai were different. The errors were caused by negative transfer or interference of L1 while learning English word stress.

From the previous studies mentioned above, it can be concluded that most EFL learners including Thai learners still face difficulties with the word stress in English. The capacity of EFL learners to produce word stress varied because of various factors such as gender, language proficiency, syllable structure of English words, lack of knowledge of rules on English word stress, and L1 transfer.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter provides information about the methodology of the study. It includes the participants of the study, instruments of the study, procedures, and data analysis.

3.1 Participants

The participants of this study were 14 second year English major students studying EG 2503 English Linguistics 2 course at Huachiew Chalermprakiet University in academic year 2020. The justification for choosing the second- year students was that these students had already taken 2 English Linguistics courses in the previous academic year and all of them volunteered to take part in this project. This would serve one of the objectives of this study; to test the recognition and production of English word stress with participants who had basic knowledge of English Linguistics.

3.2 Instruments

The data were collected by using a word stress assignment which comprised of a list of 45 common words. They are 15 two -syllable words, 15 three- syllable words, and 15 four-syllable words. Since all of the participants study English Linguistics course, it was expected that these students were familiar with the words selected from the Supplementary Handouts of the English Linguistics 2 course. So, a list of 60 words was collected from the Supplementary Handouts of the English Linguistics 2 course. To ensure the data obtained from the participants could be generalized, the list of 60 words was used in a pilot study with 5 students. If the students have difficulty

understanding and pronouncing some words on the list, those words will be excluded from the list. As a result, a list of 45 words were checked for their primary stresses in Cambridge dictionary. Then all of them were used as the word stress assignment.

The list of two-syllable words, three-syllable words, and four-syllable words were as follows.

Two syllable words	Three syllable words	Four syllable words
perform /pəˈfɔːrm/	vitamin /ˈvaɪ.ɾə.mɪn/	reality /riˈæl.ə.ti/
expect /ɪkˈspekt/	certainly /ˈsɝːtən.li/	politician /ˌpɑː ləˈtɪʃ. ən/
Chinese /ʧaɪˈniːz/	benefit /ˈben.ə.fɪt/	discovery /dɪˈskʌv ɚ.i/
express /ɪkˈspres/	volunteer /ˌvɑːlənˈtɪr/	apologize /əˈpɑː lə. dʒaɪz/
forest /ˈfɔːrɪst/	continue /kənˈtɪn.juː/	calculator /ˈkæl. kjə. leɪ. ɾəː/
ocean /ˈoʊ.ʃən/	government /ˈgʌv. ɚn. mənt/	conversation /ˌkɑːn vəˈseɪ. ʃən/
knowledge /ˈnɑːlɪdʒ/	relative /ˈrel. ə. ɾɪv/	dictionary /ˈdɪk. ʃən. er.i/
return /rɪˈtɝːn/	guarantee /ˌger.ənˈtiː/	geography /dʒiˈɑː grə.fi/
traffic /ˈtræf.ɪk/	calendar /ˈkæl. ən.dəː/	economic /i.kəˈnɑː. mɪk/
challenge /ˈʧæl.ɪndʒ/	elephant /ˈel. ə. fənt/	automatic /ˌɑː ɾəˈmæɾ ɪk/
mistake /mɪˈsteɪk/	organize /ˈɔːr. gən. aɪz/	environment /ɪnˈvaɪ. rən. mənt/

Two syllable words	Three syllable words	Four syllable words
income /ˈɪn.kʌm/	manager /ˈmæn. ə dʒəˑ/	electronic /iˌlekˈtrɑː nɪk/
unfair /ʌnˈfer/	performance /pəˑˈfɔːr məns/	comprehension /ˌkɑːm prəˈhen.ʃən/
control /kənˈtroʊl/	Recommend /ˌrek əˈmend/	emergency /ɪˈmɜˑː dʒən.si/
silence /ˈsaɪ.ləns/	Faculty /ˈfæk əl t̬i/	independence /ˌɪn. dɪˈpen. dəns/

3.3 Data collection

The data collection took place in the second semester of academic year 2020. The word stress assignment was distributed to the participants in English Linguistics 2 class in the fourth week of the semester. For the first step after the consenting process, the participants were informed to place the stress mark (/) over the stressed syllable in the word stress assignment which contains 15 two-syllable words, 15 three-syllable words, and 15 four-syllable words. After doing the assignment, the participants were given 20 minutes to prepare themselves before reading all of the words in the assignment. Each participant pronounced all of 45 words, and the data was recorded. The researcher was responsible for administering and recording the participants' pronunciation for data analysis of word stress. All the recordings were listened to by three raters: the researcher and two native speakers of English working as English lecturers at Huachiew Chalermprakiet University. After completing the pronunciation task, the participants had the interview which focuses on what the participants thought about their performance and their English language exposure. The questions of the interview were as follows;

Interview questions

1. Do you enjoy studying English?
2. How long have you been studying English?
3. How do you rate your overall proficiency in English as compared with the proficiency of other students in your current class?
4. How important is it for you to become proficient in English?
5. What English skill is considered the most difficult for you?
6. What do you think about your pronunciation of word stress and word stress assignment?
7. Why do you want to study English?

3.4 Data Analysis

The analysis of the data was conducted in five stages:

(1) In the first stage, the researcher scored the word stress assignment manually; a 1 was assigned to each correct answer, and a 0 to each incorrect one. The error frequency and percentage of two-syllable, three-syllable and four-syllable English words were calculated.

(2) In the second stage, the participants read all 45 English words, and their readings were recorded. Then the researcher and two native English teachers listened to each student's recording and marked the primary stress on the target words which corresponded to each student pronunciation.

(3) The error frequency and percentage of two-syllable, three-syllable and four-syllable English word pronunciation were calculated.

(4) In the fourth stage, each student's stress marking task and word stress production task were compared and analyzed.

(5) In the final stage, the interview data was collected and analyzed to find out whether there were any factors attributable to the word stress errors.

CHAPTER 4

RESULTS

The results of the analyses in this study were both quantitative and qualitative. The aim of the quantitative analysis was to investigate whether English major students were able to assign word stress to two-syllable, three-syllable and four-syllable English words correctly, and whether there was a relationship between their competence in recognizing and in producing English word stress, while the aim of the qualitative analysis was to find out what factors affected the word stress errors.

4.1 Students' stress placements of two-syllable, three-syllable and four-syllable English words

For the stress placement task, the study revealed that most of the students can assign the primary stress to two-syllable, three-syllable and four-syllable English words correctly. The results were as follows.

Table 1: The numbers of the correct and incorrect placements of stress of two-syllable words

Two syllable words	Number of the correct stress placements	Number of the incorrect stress placements
1. traffic	14 (100%)	0 (0%)
2. challenge	14 (100%)	0 (0%)
3. perform	13 (92.85%)	1 (7.15%)

Two-syllable words	Number of the correct stress placements	Number of the incorrect stress placements
4. ocean	13 (92.85%)	1 (7.15%)
5. unfair	12 (85.71%)	2 (14.29%)
6. express	11 (78.57%)	3 (21.43%)
7. control	11 (78.57%)	3 (21.43%)
8. silence	11 (78.57%)	3 (21.43%)
9. return	11 (78.57%)	3 (21.43%)
10. knowledge	10 (71.42%)	4 (28.58%)
11. expect	10 (71.42%)	4 (28.58%)
12. Chinese	10 (71.42%)	4 (28.58%)
13. mistake	9 (64.28%)	5 (35.72%)
14. income	8 (57.14%)	6 (42.86%)
15. forest	7 (50.00%)	7 (50.00%)
Total	164 (78.10%)	46 (21.90%)

Table 1 illustrates that the total number of the correct placements of stress of the two-syllable words was 164 (78.10%) whereas the total number of the incorrect placements of stress of the two-syllable words was 46 (21.90%). The results showed that all of the students assigned the stress correctly in the words "traffic" and "challenge", and the most problematic word for them was the word "forest" because 50% of the students assigned the primary stress on the last syllable.

Table 2: The numbers of the correct and incorrect placements of stress of three-syllable words

Three-syllable words	Number of correct stress placements	Number of incorrect stress placements
1. performance	13 (92.86%)	1 (7.14%)
2. manager	12 (85.71%)	2 (14.29%)
3. vitamin	12 (85.71%)	2 (14.29%)
4. government	11 (78.57%)	3 (21.43%)
5. guarantee	11 (78.57%)	3 (21.43%)
6. elephant	11 (78.57%)	3 (21.43%)
7. organize	11 (78.57%)	3 (21.43%)
8. faculty	11 (78.57%)	3 (21.43%)
9. benefit	9 (64.29%)	5 (35.71%)

Three-syllable words	Number of correct stress placements	Number of incorrect stress placements
10. volunteer	9 (64.29%)	5 (35.71%)
11. calendar	9 (64.29%)	5 (35.71%)
12. relative	9 (64.29%)	5 (35.71%)
13. certainly	8 (57.14%)	6 (42.86%)
14. continue	7 (50.00%)	7 (50.00%)
15. recommend	5 (35.71%)	9 (64.29%)
Total	148 (70.48%)	62 (29.52%)

Table 2 shows that the total number of the correct placements of stress of the three-syllable words was 148 (70.48%) whereas the total number of the incorrect placements of stress of the three-syllable words was 62 (29.52%). The top three words that most of the students assigned the stress correctly to were the words “performance” that receives the primary stress on the second syllable, and the words “manager”, and “vitamin” that receive the primary stress on the first syllable. The words that the students assigned stress incorrectly to most were the words “recommend”, “continue”, and “certainly”. For the words “recommend”, and “continue”, the incorrect stress placement was found on the first syllable. For the word “certainly”, the incorrect stress placement was found on the second syllable.

Table 3: Numbers of the correct and incorrect placements of stress of four-syllable words

Four-syllable words	Number of the correct stress placements	Number of the incorrect stress placements
1. conversation	13 (92.86%)	1 (7.14%)
2. discovery	12 (85.71%)	2 (14.29%)
3. apologize	12 (85.71%)	2 (14.29%)
4. environment	12 (85.71%)	2 (14.29%)
5. comprehension	12 (85.71%)	2 (14.29%)
6. independence	12 (85.71%)	2 (14.29%)
7. economic	11 (78.57%)	3 (21.43%)
8. automatic	10 (71.43%)	4 (28.57%)
9. geography	10 (71.43%)	4 (28.57%)
10. dictionary	10 (71.43%)	4 (28.57%)
11. calculator	10 (71.43%)	4 (28.57%)
12. politician	10 (71.43%)	4 (28.57%)
13. emergency	9 (64.29%)	5 (35.71%)

Four-syllable words	Number of the correct stress placements	Number of the incorrect stress placements
14. electronic	8 (57.14%)	6 (42.86%)
15. reality	2 (14.29%)	12 (85.71%)
Total	153 (72.86%)	57 (27.14%)

Table 3 shows that the total number of the correct placements of stress of the four-syllable words was 153 (72.86%) whereas the number of the incorrect placements of stress of the four-syllable words was 57 (27.14%). The results also revealed that most of the students assigned the primary stress correctly in the word "conversation", and most of them have difficulty in assigning stress to the word "reality" because 85.71% assigned the primary stress to the first syllable.

Table 4: Summary of the number of the correct and incorrect placements of stress of two to four syllable words

Words	Number of the correct stress placements	Number of the incorrect stress placements
Two-syllable words	164 (78.10%)	46 (21.90%)
Three-syllable words	148 (70.48%)	62 (29.52%)
Four-syllable words	153 (72.86%)	57 (27.14%)
Total	465 (73.81%)	165 (26.19%)

Table 4 shows the number of the correct and incorrect placement of stress of two-syllable words, three-syllable words, and four-syllable words. The results illustrated that most of the students have good mastery in assigning the stress on two-syllable words. 78.10% of the stress placement were correct while the numbers of the correct placement on the four-syllable words and three-syllable words were 72.86%, and 70.48% respectively. This finding showed that the complexity of the syllable causes difficulty to students in assigning the primary stress because the number of the incorrect stress placement of the three-syllable and four-syllable words was higher than that of the two-syllable words.

4.2 The relationship between the students' competence in recognizing and in producing English word stress

To examine the relationship between the students' competence in recognizing and in producing English word stress, the numbers of the correct productions of the two-syllable words, three-syllable words, and four-syllable words were presented and then compared with the numbers of the correct recognitions or stress placements of the two-syllable words, three-syllable words, and four-syllable words. The results are as follows.

Table 5: Stress production of two-syllable words

Two-syllable words	Number of the correct stress productions	Number of the incorrect stress productions
1. traffic	14 (100%)	0 (0%)
2. challenge	13 (92.86%)	1 (7.14%)
3. perform	14 (100%)	0 (0%)

Two-syllable words	Number of the correct stress productions	Number of the incorrect stress productions
4. ocean	14 (100%)	0 (0%)
5. unfair	13 (92.86%)	1 (7.14%)
6. express	12 (85.71%)	2 (14.29%)
7. control	11 (78.57%)	3 (21.43%)
8. silence	9 (64.28%)	5 (35.72%)
9. return	14 (100%)	0 (0%)
10. knowledge	14 (100%)	0 (0%)
11. expect	10 (71.42%)	4 (28.58%)
12. Chinese	8 (57.14%)	6 (42.86%)
13. mistake	12 (85.71%)	2 (14.29%)
14. income	7 (50%)	7 (50%)
15. forest	9 (64.28%)	5 (35.72%)
Total	174 (82.85%)	36 (17.14%)

Table 5 illustrates that the total number of the correct productions of stress of the two-syllable words was 174 (82.86%) whereas the total number of the incorrect productions of stress of the two-syllable words was 36 (17.14%). The results also showed that all of the students pronounced the stress correctly in the words “traffic”, “perform”, “ocean”, “return”, and “knowledge, and the most problematic word for them was the word “income” because 50% of the students pronounced the second syllable louder than the first one.

Table 6: Stress production of three-syllable words

Three-syllable words	Number of correct stress productions	Number of incorrect stress productions
1. performance	12 (85.71%)	2 (14.29%)
2. manager	11 (78.57%)	3 (21.43%)
3. vitamin	12 (85.71%)	2 (14.29%)
4. government	10 (71.42%)	4 (28.58%)
5. guarantee	10 (71.42%)	4 (28.58%)
6. elephant	10 (71.42%)	4 (28.58%)
7. organize	10 (71.42%)	4 (28.58%)
8. faculty	9 (64.28%)	5 (35.72%)
9. benefit	10 (71.42%)	4 (28.58%)

Three-syllable words	Number of correct stress productions	Number of incorrect stress productions
10. volunteer	9 (64.28%)	5 (35.72%)
11. calendar	6 (42.86%)	8 (57.14%)
12. relative	8 (57.14%)	6 (42.86%)
13. certainly	7 (50%)	7 (50%)
14. continue	6 (42.86%)	8 (57.14%)
15. recommend	5 (35.72%)	9 (64.28%)
Total	135 (64.29%)	75 (35.71%)

Table 6 shows that the total number of the correct productions of stress of the three-syllable words was 135 (64.29%) whereas the number of the incorrect productions of stress of the three-syllable words was 75 (35.71%). The words that most students pronounced correctly were "performance" and "vitamin", and the most problematic word was "recommend" because 64.28% of the students pronounced the first syllable louder than the second and the last syllable.

Table 7: Stress production of four-syllable words

Four-syllable words	Number of the correct stress productions	Number of the incorrect stress productions
1. conversation	14 (100%)	0 (0%)
2. discovery	12 (85.71%)	2 (14.29%)

Four-syllable words	Number of the correct stress productions	Number of the incorrect stress productions
3. apologize	13 (92.86%)	1 (7.14%)
4. environment	13 (92.86%)	1 (7.14%)
5. comprehension	12 (85.71%)	2 (14.29%)
6. independence	12 (85.71%)	2 (14.29%)
7. economic	12 (85.71%)	2 (14.29%)
8. automatic	10 (71.42%)	4 (28.58%)
9. geography	7 (50%)	7 (50%)
10. dictionary	8 (57.14%)	6 (42.86%)
11. calculator	9 (64.28%)	5 (35.72%)
12. politician	10 (71.42%)	4 (28.58%)
13. emergency	10 (71.42%)	4 (28.58%)
14. electronic	7 (50%)	7 (50%)
15. reality	2 (14.29%)	12 (85.71%)
Total	151 (71.90%)	59 (28.10%)

Table 7 shows that the total number of the correct productions of stress of the four-syllable words was 151 (71.90%) whereas the number of the incorrect productions of stress of the four-syllable words was 59 (28.10%). The results also revealed that most of the students pronounced the primary stress correctly in the word "conversation", and most of them had difficulty in pronouncing the word "reality". It was found that 85.71% of the students pronounced the first syllable louder than the others.

Table 8: The numbers of the correct and incorrect recognitions and productions of stress of two-syllable words

Two-syllable words	Number of the correct and incorrect stress recognitions		Number of the correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
1. traffic	14 (100%)	0 (0%)	14 (100%)	0 (0%)
2. challenge	14 (100%)	0 (0%)	13 (92.85%)	1 (7.15%)
3. perform	13 (92.85%)	1 (7.15%)	14 (100%)	0 (0%)
4. ocean	13 (92.85%)	1 (7.15%)	14 (100%)	0 (0%)
5. unfair	12 (85.71%)	2 (14.29%)	13 (92.85%)	1 (7.15%)
6. express	11 (78.57%)	3 (21.43%)	12 (85.71%)	2 (14.29%)
7. control	11 (78.57%)	3 (21.43%)	11 (78.57%)	3 (21.43%)
8. silence	11 (78.57%)	3 (21.43%)	9 (64.28%)	5 (35.72%)

Two-syllable words	Number of the correct and incorrect stress recognitions		Number of the correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
9. return	11 (78.57%)	3 (21.43%)	14 (100%)	0 (0%)
10. knowledge	10 (71.42%)	4 (28.58%)	14 (100%)	0 (0%)
11. expect	10 (71.42%)	4 (28.58%)	10 (71.42%)	4 (28.58%)
12. Chinese	10 (71.42%)	4 (28.58%)	8 (57.14%)	6 (42.86%)
13. mistake	9 (64.28%)	5 (35.72%)	12 (85.71%)	2 (14.29%)
14. income	8 (57.14%)	6 (42.85%)	7 (50.00%)	7 (50.00%)
15. forest	7 (50.00%)	7 (50.00%)	9 (64.28%)	5 (35.72%)
Total	164 (78.10%)	46 (21.90%)	174 (82.86%)	36 (17.14%)

In table 8, the results revealed that the numbers of the correct recognitions and productions of the primary stress of the two-syllable words were 164 (78.10%) and 174 (82.86%). This showed that the students did not have difficulty in assigning the stress mark and pronouncing two-syllable words because over 70% of stress recognitions and productions of two-syllable words were correct. The students did the production task better than the recognition task. The findings also showed that all students can assign the stress mark and pronounce the word “traffic” correctly because they are familiar with this word, and the syllable structure is not complicated.

Table 9: The numbers of the correct and incorrect recognitions and productions of stress of three-syllable words

Three-syllable words	Number of correct and incorrect stress recognitions		Number of correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
1. performance	13 (92.85%)	1 (7.15%)	12 (85.71%)	2 (14.29%)
2. manager	12 (85.71%)	2 (14.29%)	11 (78.57%)	3 (21.43%)
3. vitamin	12 (85.71%)	2 (14.29%)	12 (85.71%)	2 (14.29%)
4. government	11 (78.57%)	3 (21.43%)	10 (71.42%)	4 (28.58%)
5. guarantee	11 (78.57%)	3 (21.43%)	10 (71.42%)	4 (28.58%)
6. elephant	11 (78.57%)	3 (21.43%)	10 (71.42%)	4 (28.58%)
7. organize	11 (78.57%)	3 (21.43%)	10 (71.42%)	4 (28.58%)
8. faculty	11 (78.57%)	3 (21.43%)	9 (64.28%)	5 (35.72%)
9. benefit	9 (64.28%)	5 (35.72%)	10 (71.42%)	4 (28.58%)
10. volunteer	9 (64.28%)	5 (35.72%)	9 (64.28%)	5 (35.72%)
11. calendar	9 (64.28%)	5 (35.72%)	6 (42.86%)	8 (57.14%)
12. relative	9 (64.28%)	5 (35.72%)	8 (57.14%)	6 (42.86%)

Three-syllable words	Number of correct and incorrect stress recognitions		Number of correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
13. certainly	8 (57.14%)	6 (42.86%)	7 (50.00%)	7 (50.00%)
14. continue	7 (50.00%)	7 (50.00%)	6 (42.86%)	8 (57.14%)
15. recommend	5 (35.72%)	9 (64.28%)	5 (35.72%)	9 (64.28%)
Total	148 (70.48%)	62 (29.52%)	135 (64.29%)	7 (535.71%)

Table 9 above shows that the numbers of the correct recognitions and productions of stress of the three-syllable words were 148 (70.48%) and 135 (64.29%). This indicated that the students did not have difficulty in assigning the stress to the three-syllable words because 70.48% of the stress placements were correct. For the stress production, the results revealed that the students had difficulties in pronouncing three-syllable words because only 64.29% of the stress productions were correct and the most problematic word was the word "recommend" which 64.28% of the students pronounced the first syllable louder than the others.

Table 10: The numbers of the correct and incorrect placements of stress of four-syllable words

Four-syllable words	Number of the correct and incorrect stress recognitions		Number of the correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
1. conversation	13 (92.85%)	1 (7.15%)	14 (100%)	0 (0%)

Four-syllable words	Number of the correct and incorrect stress recognitions		Number of the correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
2. discovery	12 (85.71%)	2 (14.29%)	12 (85.71%)	2 (14.29%)
3. apologize	12 (85.71%)	2 (14.29%)	13 (92.85%)	1 (7.15%)
4. environment	12 (85.71%)	2 (14.29%)	13 (92.85%)	1 (7.15%)
5. comprehension	12 (85.71%)	2 (14.29%)	12 (85.71%)	2 (14.29%)
6. independence	12 (85.71%)	2 (14.29%)	12 (85.71%)	2 (14.29%)
7. economic	11 (78.57%)	3 (21.43%)	12 (85.71%)	2 (14.29%)
8. automatic	10 (71.42%)	4 (28.58%)	10 (71.42%)	4 (28.58%)
9. geography	10 (71.42%)	4 (28.58%)	7 (50.00%)	7 (50.00%)
10. dictionary	10 (71.42%)	4 (28.58%)	8 (57.14%)	6 (42.85%)
11. calculator	10 (71.42%)	4 (28.58%)	9 (64.28%)	5 (35.72%)
12. politician	10 (71.42%)	4 (28.58%)	10 (71.42%)	4 (28.58%)
13. emergency	9 (64.28%)	5 (35.72%)	10 (71.42%)	4 (28.58%)
14. electronic	8 (57.71%)	6 (42.86%)	7 (50.00%)	7 (50.00%)

Four-syllable words	Number of the correct and incorrect stress recognitions		Number of the correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
15. reality	2 (14.29%)	12 (85.71%)	2 (14.29%)	12 (85.71%)
Total	153 (72.86%)	57 (27.14%)	151 (71.90%)	59 (28.10%)

Table 10 reveals that the numbers of the correct recognitions and productions of stress of the four-syllable words were 153 (72.86%) and 151 (71.90%). This showed that the students did not have difficulty in pronouncing and putting the stress placements on the four-syllable words because above 70% of the stress recognitions and productions were correct. However, the results showed that most of the students cannot pronounce and assign the primary stress on the word "reality" correctly because 85.71% of the students assigned the primary stress to the first syllable and pronounced the first syllable louder than the others.

Table 11: Summary of the numbers of the correct and incorrect recognitions and productions of stress of two to four syllable words

Words	Number of the correct and incorrect stress recognitions		Number of the correct and incorrect stress productions	
	Correct	Incorrect	Correct	Incorrect
Two-syllable words	164 (78.10%)	46 (21.90%)	174 (82.86%)	36 (17.14%)
Three-syllable words	148 (70.48%)	62 (29.52%)	135 (64.29%)	75 (35.71%)
Four-syllable words	153 (72.86%)	57 (27.14%)	151 (71.90%)	59 (28.10%)
Total	465 (73.81%)	165 (26.19%)	460 (73.02%)	170 (26.98%)

Table 11 shows the numbers of the correct and incorrect recognitions and productions of stress of two-syllable words, three-syllable words, and four-syllable words. The results revealed that most of the students did not have much difficulty in the stress recognition and production of two-syllable words, three-syllable words, and four-syllable words. Over 70% of stress recognitions and productions were correct. Three-syllable words caused difficulty to the students because the numbers of the incorrect recognitions and productions of the three-syllable words were the highest. The incorrect recognitions and productions of the three- syllable words were 62 (29.52%) and 75 (35.71%) whereas the incorrect recognitions and productions of the two-syllable words were 46 (21.90%) and 36 (17.14%) and of the four-syllable words were 57 (27.14%) and 59 (28.10%). The study revealed that there were small differences of the correct and incorrect numbers between the stress recognition and production.

4.3 The factors affecting the students' word stress errors

The results of this study illustrated some errors in word stress recognition and production. The students' word stress errors may be caused by 1) the differences of the stress patterns between English and Thai, and 2) the complexity of the syllables, and 3) the inadequate knowledge of syllable structure. According to the level of difficulty in second language learning (Brown, 2000), Thai students tried to learn the stress patterns in English which differ from Thai. Isarangkura (2018) mentioned that in Standard Thai, many linguists seem to agree that word-final position has the strongest stress. This means stress is fixed in Thai words and it always falls on the last syllable, irrespective of the number of syllables within a word whereas the position of stress in English words is not fixed. The results revealed that the students found it difficult to place stress on the right syllables of the English words. For two-syllable words, the most problematic word was "income" which receives the primary stress on the first syllable. For three-syllable words, the most problematic word was "recommend" which receives the primary stress on the last syllable, and for

four-syllable words, the most problematic word was “reality” which receives the primary stress on the second syllable.

The complexity of the syllable also caused difficulty to the students because it was found that the students made more errors in the recognition and production of three-syllable and four-syllable words than they did with two-syllable words. For two-syllable words, the numbers of incorrect stress placements and stress productions were 46 (21.90%) and 36(17.14%). For three-syllable words, the numbers of incorrect stress placements and stress productions were 62 (29.52%)and 75 (35.71%). For four-syllable words, the numbers of incorrect stress placements and stress productions were 57 (27.14%) and 59 (28.10%).

The lack of knowledge of syllable structures may cause difficulty to the students when assigning or pronouncing stressed syllables. In English, a strong or weak syllable is usually determined by syllable structure. A strong syllable contains a long vowel or diphthong with or without a final consonant, or a short vowel followed by one or more final consonants. A weak syllable contains a short vowel and no final consonants unless the syllable peak is a schwa /**ə**/ (Roach, 2008). A strong syllable is normally stressed, while the weak one is unstressed. For example, in the word “return”, the first syllable [r**ɪ**] has no coda thus it is a weak syllable, while the second syllable /t**ə**n/ is a strong syllable as it contains a long vowel/**ə** / and a coda /n/. So, the stress should be placed on the strong syllable, i.e. the second one. In the word “geography”, the first, third and final syllables contain short vowel /i/ and /**ə**/,thus the antepenultimate syllable or the third syllable from the last should be stressed. The study showed that 50% of the students pronounced the word “geography” correctly.

To explain the factors affecting stress recognition and production deeply, the researcher interviewed all 14 students. The interview focused on what the students thought about their word stress recognition and production and their English language exposure. Most students agreed that English word stress is difficult because each word has a different stress pattern. For example, if the word “present” functions as a verb, the primary stress falls on the second syllable. If it functions as a noun, the primary

stress falls on the first syllable. They said two-syllable words were not difficult because most two-syllable words have the primary stress on the first syllable. They also added that three-syllable words cause problems for them because they were confused with the primary and the secondary stress and they cannot apply the stress rules with the three-syllable words. However, they thought that word stress is difficult to learn, and they don't have enough knowledge of English word stress.

4.4 Summary

The research results showed that most of the students do not have much difficulty in assigning the stress on two-syllable words. 78.09% of the stress placement were correct while the numbers of the correct placements on the four-syllable words and three-syllable words were 72.86%, and 70.48% respectively. For the stress production, it was found that most of the students can pronounce two-syllable words, three-syllable words, and four-syllable words with correct stress placement. To compare word stress recognition and production, the results revealed above 70% of stress recognition and productions were correct. Three-syllable words caused most difficulty to the students because the numbers of the incorrect recognitions and productions of the three-syllable words were 62 (29.52%) and 75 (35.71%), whereas the incorrect recognitions and productions of the two-syllable words were 46 (21.90%) and 36 (17.14%) and four-syllable words were 57 (27.14%) and 59 (28.10%).

However, it was found that the ability of the students to assign the primary stress to the two-syllable, three-syllable, and four-syllable words correlated with their ability to pronounce them.

CHAPTER 5

CONCLUSIONS, DISCUSSIONS, IMPLICATIONS, AND RECOMMENDATIONS

From the research findings, the conclusions, discussions, implications, and recommendations are to be presented based on the three research questions involving students' stress placement of two-syllable, three-syllable and four-syllable English words, the relationship between the students' competence in recognizing and in producing English word stress, and the factors affecting word stress errors.

5.1 Conclusions

This section reports several issues related to the theories and previous studies in the following research questions:

1) To what extent can English major students assign stress to two-syllable, three-syllable, and four-syllable English words correctly?
2) Is there a significant correlation between the learners' competence in recognizing and in producing stress of English words?
3) What are the factors affecting their word stress errors?

For the first research question concerning the ability of English major students to assign stress to two- syllable, three-syllable and four-syllable English words, the results revealed that most of the students do not have much difficulty in assigning the stress to two-syllable, three-syllable, and four-syllable words. Above 70 % of word stress placements of two-syllable words, three-syllable words, and four-syllable words were correct. For two-syllable words, it was found that all students can assign the primary stress correctly to the word "traffic", and one explanation could be that the students are familiar with this word, and most of the two-syllable words receive the primary stress on the first syllable. However, it was found that the

word “forest” caused difficulty for most of the students because only 50% of the stress placemen

were correct and 50% were incorrect. The false analogy may be the cause of the error. It may be hypothesized that when the students pronounce this word, they use the same stress pattern as the word “arrest” that they already know.

For the three-syllable words, most of the students assigned the stress correctly to the word “performance” that receives the primary stress on the second syllable. This is because the major stress falls on the first or second syllable of three syllable words (Kanoksilapatham, 2010), so the students can assign the primary stress to the word “performance” correctly whereas they have difficulty with the word “recommend” which receives the primary stress on the last syllable. Moreover, the results revealed that the number of the incorrect placements of the three-syllable words was the highest. This in line with Krojo (2016) who found that three-syllable words were more problematic than two-syllable words, and the misplacement of stress was caused by the influence of vowel length and vowel height. For the four-syllable words, the results showed that most of the students assigned the primary stress correctly in the word “conversation”, and most of them have difficulty in assigning stress to the word “reality” which receives the primary stress on the second syllable.

For the second research question concerning the relationship between word stress recognition and production, the results revealed that that the numbers of the correct recognitions and productions of the primary stress of the two-syllable words were 164 (78.10%) and 174 (82.86%). This showed that the students do not have difficulty in assigning the stress mark and pronouncing two-syllable words because over 70% of stress recognition and productions of two-syllable words were correct. It was found that the students did the production task better than the recognition task. Four words that all the students pronounced correctly were “perform”, “ocean”, “return”, and “knowledge”. For three-syllable words, the number of the correct recognition and production of stress of the three-syllable words were 148 (70.48%) and 135 (64.29%). This indicated that the students did not have difficulty in assigning the stress to the three-syllable words because 70.47% of the stress placement were correct. For the stress production, the results revealed that the students had difficulties in pronouncing three-syllable words because only

64.29% of the stress productions were correct and the most problematic word was the word “recommend” which receives the primary stress on the last syllable.

The numbers of the correct recognitions and productions of stress of the four-syllable words were 153 (72.86%) and 151 (71.10%). This showed that the students do not have difficulty in pronouncing and putting the stress placement on the four - syllable words because over 70% of the stress recognitions and productions were correct. However, the results showed that most of the students cannot pronounce and assign the primary stress on the word “reality” correctly because 85% of the students assigned the primary stress to the first syllable, and pronounced the first syllable louder than others. It can be concluded that most of the students do not have much difficulty in the stress recognition and production of two-syllable words, three-syllable words, and four-syllable words. Over 70% of stress recognitions and productions were correct. Three-syllable words caused much difficulty to the students because the number of the incorrect recognitions and productions of the three-syllable words were 62 (29.52%) and 75 (35.71%) whereas the incorrect recognitions and productions of the two-syllable words were 46 (21.90%) and 36 (17.14%) and of the four-syllable words were 57 (27.14%) and 59 (28.10%) respectively.

For the third research question concerning the factors affecting students’ word stress errors, the results of this study illustrated some errors in word stress recognition and production. The students’ word stress errors may be caused by 1) the differences of the stress patterns between English and Thai, and 2) the complexity of the syllables, and 3) the inadequate knowledge of syllable structure. Because of the differences of stress pattern between English and Thai, the results revealed that the students found it difficult to assign stress to the right syllables of the English words. In Thai, the stress pattern is fixed, whereas it is not fixed in English. The study revealed that the most problematic word in the group of two-syllable word was “income” which receives the primary stress on the first syllable. For three-syllable words, the most problematic word was “recommend” which receives the primary stress on the last syllable, and for four-syllable words,

the most problematic word was “reality” which receives the primary stress on the second syllable.

The complexity of the syllable also caused difficulty to the students because it was found that the students made more errors in the recognition and production of three-syllable and four-syllable words than two-syllable words. In English, the number of syllables, affixes, and/or the grammatical category of the word are believed to have a significant impact on word stress placement (Celce-Murcia, Brinton, and Goodwin, 1996).Isarangura (2016) mentioned that the degree of stress placement decreased as the number of syllables increased.

Syllable structure helps identifying the stress pattern of English words. A strong syllable is normally stressed, while the weak one is unstressed (Roach, 2000).
The study revealed that four-syllable words caused less difficulty than three-syllable words. The results suggested that the students who took linguistics courses were aware that certain suffixes do not receive the primary stress. From the interview, most students agreed that English word stress is difficult because each word has a different stress pattern. For example, if the word “present” functions as a verb, the primary stress falls on the second syllable. If it functions as a noun, the primary stress falls on the first syllable. They said two-syllable words were not difficult because most two-syllable words have the primary stress on the first syllable. They also added that four-syllable words do not cause difficulty for them, but three - syllable words cause much difficulty for them because they cannot apply the stress rules they have learned and they have inadequate knowledge of English word stress.

5.2 Discussions

The difficulties in assigning word stress of the students may be caused by the differences of the stress patterns between English and Thai and the complexity of the syllable. Stress is fixed in Thai words and it always falls on the last syllable, irrespective of the number of syllables within a word whereas the position of stress in English words is not fixed. So, it is quite difficult for Thai students to assign word stress correctly. The complexity of the syllable also caused difficulty to students in assigning the primary stress. In this study, the number of the incorrect stress

placements of the three-syllable words and four-syllable words was higher than for two-syllable words. According to the stress rules, most of two-syllable words receive the primary stress on the first syllable (Jotikasathira,1999), and there are only two choices, either first or final syllable that should be stressed (Krajo, 2015). So, most of the students can assign the primary stress on the two-syllable words correctly.

For the relationship between the stress recognition and production, the results revealed that most of the students did not have much difficulty in the stress recognition and production of two-syllable words, three-syllable words, and four-syllable words. Over 70% of stress recognitions and productions were correct. However, it was found that the number of the incorrect stress recognition and production of three-syllable words was the highest because most of the three-syllable words do not end with the suffixes which can be predicted by the rules, and the primary stress falls on different position. So, it was quite difficult for the students to identify the stressed syllable correctly. For the four-syllable words, it was found that the number of the incorrect placements was lower than for the three-syllable and two-syllable words because most of the four-syllable words in this study have suffixes which can be predicted according to the rules or the patterns of word stress. According to Kanoksilapatham (2010), the placement of primary stress is predictable in the words with some suffixes. The suffixes indicating that syllable preceding them receives primary stress are -ial, -ian, -ible, ic, -ical,-ient, -ify, -(t)ion, -ior,-ious, -ish, -ity, -logy,-meter, -ive, -ual, and-wise. So, it was found that four-syllable words which contain suffixes did not cause difficulty to the students except the word “reality” which most students put the primary stress on the first syllable and pronounced the first syllable louder than others. So, in recognition and production of word stress, it is essential to consider 1) the complexity of the syllables, 2) the word class, 3) the number of syllables, and 4) the phonological structure of those syllables (Roach, 2000). However, there were small differences between the stress recognition and production because the total number of correct recognitions of stress of two-syllable words, three-syllable words, and four-syllable words was approximately 78% and the total number of correct productions of stress of two-syllable words, three-syllable

words, and four-syllable words was approximately 82%. This showed that the students performed better in the production task than they did in the recognition task.

The results of this study illustrated some errors in word stress recognition and production. The errors may be caused by 1) the differences of the stress patterns between English and Thai, and 2) the complexity of the syllables, and 3) the inadequate knowledge of syllable structure. It is clear that English is a free-stress language. It means that word stress can fall on various syllables whereas stress in Thai is fixed. Because of this, English word stress still causes difficulty to Thai students and misplaced word stress in English may lead to communication breakdown. Therefore, sufficient knowledge and practice in stress placement rules can help enhance students' communicative competence and performance. Students should pay more attention to the feature and they may practice imitating the teachers or the instruction on the CD, and then his or her ability to use proper stress patterns when speaking English will improve (Dales and Poms, 2005).

5.3 Implications of the study

This study addressed the difficulty of Thai students in using correct stress patterns when pronouncing English polysyllabic words. The results of this study offer some pedagogical implications.

Firstly, this study can help both teachers and students become aware of word stress in English. It is clear that word stress is important in English in order to communicate intelligibly. So, students should be careful when pronouncing English words because incorrect stress placement can lead to misunderstanding.

Secondly, knowing the differences between English and Thai stress patterns help teachers understand the difficulties that Thai students might face when pronouncing English words. It will help teachers to prepare the lessons, exercises, and teaching methods to teach word stress patterns in English polysyllabic words.

Lastly, it is clear that learning linguistics helps Thai students understand the nature and the rules of language. The students can assign and pronounce English

polysyllabic words with correct patterns more accurately. This shows that knowledge of linguistics is the first essential step in learning a foreign language.

5.4 Recommendations for further research

Based on the findings of the study, the following aspects could be investigated for further studies.

Firstly, this study is limited by a small sample size. Further research can be extended with larger groups of participants so as to validate the relationship between the students' competence and performance in pronouncing English word stress.

Secondly, this study was conducted with English major students, so a study of similar nature should be conducted with different groups of participants to enhance the degree of generalization about word stress recognition and production.

Finally, further research may be conducted to investigate pronouncing words in context, not only words in isolation and also the perception and production of word stress in English words of students with different levels of English proficiency. The results may help us understand the word stress perception and production problems that affect the students' listening and speaking skills.

References

Bourjan, T. (2003).**Problem on Stress in English Pronunciation of Mathayomsuksa 6 Students.** (M.A. Thesis). Mahasarakham University.

Brown, D.H. (2000). **Principles of Language Learning and Teaching.** New York : Longman.

Celce-Murcia, M.,Brinton, D., &Goodwin, J. (1996).**Teaching Pronunciation: A reference for teachers of English to speakers of other languages**. Cambridge and New York: Cambridge University Press.

Chuleethongrerk, S. (2006). **Primary Stress Variation of English Disyllabic Words by Thai Undergraduate Students.** Unpublished Master's Research Paper. Thammasat University, Language Institue.Corder, S.P. (1967). **The Significance of Learners' errors.** International Review of Applied Linguistics.

Corder, S.P. (1973). **Introducing Applied Linguistics.** Middlesex : Penguin.

Corder, S.P. (1981). **Error Analysis and Interlanguage.** Oxford : Oxford University Press.Dales, P. and Poms, L. (2005). **English Pronunciation Made Simple.** London : Longman.

Dalus, S. (2009). **Errors Analysis of the English Essays of Secondary School Students in Malasia : A Case Study.** European Journal of Sciences. 8.

Dulay, H.C. and Burt, M.K. (1974). **Errors and Strategies in Child Language Acquisition.** TESOL Quarterly, 3 (2).

Dulay, H.C., Burt, M., and Krashen, S. (1982). **Language Two.** New York : Oxford University Press.

Ellis, R. and Barkhuizen, G. (2005). **Analysing Learner Language.** Oxford : Oxford University Press.

El-Dakhs and Mitchell, (2011). **Spelling Errors among EFL High-School Graduates.**Proceedings of the 4th Annual KSAALT Conference.

References (Cont.)

Fraser, H. (2000). **Coordinating Improvements in Pronunciation Teaching for Adults Learners of English as a Second Language.** [On line] Available : http://mets.une.edu.au/fraser/docs.

Gass, S.M., and Selinker, L. (2008). **Second Language Acquisition : An Introductory Course.** New York : Routledge.

Harmer, J. (1991). **The Practice of English Language Teaching.** New York : Longman

Hedge, T. (2000). **Teaching and Learning in the Language Classroom.** New York : Oxford University Press.

Hiranburana, S. (1972). **Changes in the Pitch contours in unaccentuated syllables in spoken Thai.** In J. Harris & R.B. Noss (Eds.) Phonetics and Phonology. Mahidol University.

Isarankura, S. (2016). **Effects of Stress Patterns and Tones in Thai on Stress Placement in English Polysyllabic Loanwords among Thai Students in English Major Program.** Dhurakij Pundit University.

Isarankura, S. (2018). **The Effects of Stress and Tones in Thai on the Pronunciation of English Polysyllabic Loanwords among Thai EFL Students.** Language Education and Acquisition Research Network Journal, Vol. 11, Issue 2.

Jaiprasong, S., and Pongpairoj, N. (2020). **L2 Production of English Word Stress by L1 Thai Learners.** LEARN Journal. Vol. 13.

James, C. (2013). **Errors in Language Learning and Use.** Exploring Error Analysis.New York : Routledge.

Jenkins, J. (2000). **The Phonology of English as an International Language.** Oxford : Oxford University Press.

Jenkins, J. (2009). **The Phonology of English as an International Language : *New Models,New Models, New Norms, New Goals.*** Oxford : Oxford University Press.

Jotikasathira, P. (1999). **Introduction to the English Language System and Structure.** Bangkok : Chulalongkorn University Press.

References (Cont.)

Kanoksilapatham, B. (2010). **Pronunciation in Action.** The Textbook and Book Project, Faculty of Arts, Silapakorn University.

Khamkhien, A. (2010). **Thai Learners' English Pronunciation Competence : *Lesson* Learned from Word Stress Assignment.** Journal of Language Teaching and Research, Vol. 1, No. 6.

Krajo, C. (2015). **Accounting for L2 learners' errors in word stress placement.**Indonesian Journal of Applied Linguistics. Vol. 5.

Kreidler, C.W. (1997). **Describing Spoken Language : An Introduction.** New York : Routledge.

Ladefoged, P. and Johnson, K. (2011). **A Course in Phonetics.** *(International Edition).* Wadsworth : Cengage Learning.

Lado, R. (1977). **Language Teaching : A Scientific Approach.** New York : McGraw-Hill.

Liu, D. (2017). **The Acquisition of English Word Stress by Mandarin EFL Learners.**English Language Teaching Vol.10

Murphy, J.M. (1991). **Oral Communication in TESOL : Integrating speaking, listening, and pronunciation.** TESOL Quarterly, 25 (1), 51-75.

Nemser, W. (1971). **Approximative Systems of Foreign Language Learners.** IRAL 9.

Nipa, A. (2006). **An Investigation of the English Word Stress Perception and Production Skills of Thai 12th Grade Students.** (M.A. Thesis). Srinakharinwirot University.

Plansangket, C. (2016). **Word Stress Errors of Graduate Students in Thailand : A Study of CEIC Program.** An Independent Study Paper. Thammasat University.

Richards, J.C. (ed). (1974). **Error Analysis : Perspectives on Second Language Acquisition** London: Longman.

Richards, J.C., and Schmidt, R. (2010). **Longman Dictionary of Language Teaching and Applied Linguistics.** London : Longman.

Roach, P. (2009). **English Phonetics and Phonology.** A Practical Course. Cambridge :Cambridge University Press.

References (Cont.)

Rogerson-Revell, P. (2012). **English Phonology and Pronunciation Teaching.** New York : Continuum International Publishing Group.

Swalameh, M.H.M. (2013). **Error Analysis of English Written Essay : The Case of Students of the Preparatory Year Program in Saudi Arabia.** University of Ha 'il.

Swan, M., and Smith, B. (2001). **Learner English.** A Teacher's guide to Interference and other problems. Cambridge : Cambridge University Press.

Swalameh, M.H.M. (2013). **Error Analysis of English Essays : The Case of Students of the Preparatory Year in Saudi Arabia.** English for Specific Purposes World. Vol.14.

Tuan, D. (2018). **English Lexical Stress Assignment by EFL Learners : *Insights from a Vietnamese Context.*** European Journal of Education Studies.

Underhill, A. (1994). **The Teacher Development Series : Sound Foundations Living Phonology.** Great Britain: The Bath Press.

Watanapokakul, S. (2010). **The Relationship between the CU Students' Ability to Identify Stress Patterns of English Polysyllabic Medical Terms and the Ability to Pronounce them.** PASAA. Vol.43.

Weda, S. (2018). **Problems on English Word Stress Placement Made by Indonesian learners of English.** ELS. Journal on Interdisciplinary Studies on Humanities. Vol.1

Yangklang, W. (2013). **Improving English Stress and Intonation Pronunciation of the First Year Students of Nakhon Ratchasima Rajabhat University through an E-Learning.** Available online at www.sciencedirect.com

Zawahreh, F. (2012). **Applied Error Analysis of Written Production of English Essaysof Tenth Grade Students in Ajloun Schools, Jordan.** International Journal of Learning and Development.

APPENDIX A

Word stress assignment

Directions: Put the stress mark (✓) over the stressed syllable.

1. perform
2. vitamin
3. reality
4. expect
5. certainly
6. politician
7. Chinese
8. benefit
9. discovery
10. express
11. volunteer
12. apologize
13. forest
14. continue
15. calculator
16. ocean
17. government
18. conversation
19. knowledge
20. relative
21. dictionary
22. return
23. traffic
24. geography
25. challenge
26. calendar
27. guarantee
28. mistake
29. elephant
30. economic
31. income
32. organize
33. environment
34. unfair
35. manager
36. electronic
37. control
38. performance
39. comprehension
40. silence
41. recommend
42. emergency
43. automatic
44. faculty
45. independence

Directions: Read all of the following words.

1. perform
2. vitamin
3. reality
4. expect
5. certainly
6. politician
7. Chinese
8. benefit
9. discovery
10. express
11. volunteer
12. apologize
13. forest
14. continue
15. calculator
16. ocean
17. government
18. conversation
19. knowledge
20. relative
21. dictionary
22. return
23. traffic
24. geography
25. challenge
26. calendar
27. guarantee
28. mistake
29. elephant
30. economic
31. income
32. organize
33. environment
34. unfair
35. manager
36. electronic
37. control
38. performance
39. comprehension
40. silence
41. recommend
42. emergency
43. automatic
44. faculty
45. independence

Appendix B

WORD STRESS RECOGNITION

Two-syllable words

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
perform	○●*		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	●○**	X														1
expect	○●	✓			✓		✓	✓	✓	✓	✓		✓	✓	✓	10
	●○		X	X		X						X				4
Chinese	○●		✓		✓	✓	✓	✓		✓		✓	✓	✓	✓	10
	●○	X		X					X		X					4
express	○●	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓		11
	●○										X	X			X	3

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
forest	●○	✓	✓					✓		✓			✓	✓	✓	7
	○●			X	X	X	X		X		X	X				7
ocean	●○	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	13
	○●						X									1
knowledge	●○		✓	✓		✓		✓	✓	✓		✓	✓	✓	✓	10
	○●	X			X		X				X					4
return	○●		✓		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	11
	●○	X		X								X				3
traffic	●○	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	○●															0
challenge	●○	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	○●															0
mistake	○●		✓	✓		✓		✓	✓	✓			✓	✓	✓	9
	●○	X			X		X				X	X				5

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
income	●○		✓		✓	✓		✓	✓	✓			✓	✓		8
	○●	X		X			X				X	X			X	6
unfair	○●	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	12
	●○			X			X									2
control	○●		✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	11
	●○	X		X			X									3
silence	●○	✓		✓	✓	✓		✓	✓	✓		✓	✓	✓	✓	11
	○●		X				X				X					3

●* = stressed syllable

○** = unstressed syllable

Three-syllable words

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
vitamin	●○○	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	12
	○●○					X					X					2
	○○●															0
certainly	●○○		✓		✓		✓	✓	✓			✓	✓	✓		8
	○●○	X		X		X				X	X				X	6
	○○●															0
benefit	●○○	✓	✓		✓		✓	✓		✓			✓	✓	✓	9
	○●○			X		X			X		X	X				5
	○○●															0
volunteer	○○●	✓	✓	✓		✓	✓		✓		✓	✓		✓		9
	●○○				X											1
	○●○							X		X			X		X	4

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
continue	○●○		✓			✓	✓				✓	✓	✓	✓		7
	○○●															0
	●○○	X		X	X			X	X	X					X	7
government	●○○	✓	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓		11
	○●○			X				X							X	3
	○○●															0
relative	●○○		✓		✓	✓		✓	✓		✓	✓		✓	✓	9
	○●○	X		X			X			X			X			5
	○○●															0
calendar	●○○	✓	✓		✓	✓		✓			✓	✓		✓	✓	9
	○●○			X			X		X	X			X			5
	○○●															0
guarantee	○○●	✓	✓		✓		✓	✓				✓	✓	✓	✓	9
	●○○															0
	○●○			X		X			X	X	X					5

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
elephant	●○○		✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		✓	11
	○●○	X					X							X		3
	○○●															0
organize	●○○		✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	11
	○●○	X			X			X								3
	○○●															0
manager	●○○	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	12
	○●○			X									X			2
	○○●															0
performance	●○○		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	○●○	X														1
	○○●															0
recommend	○○●				✓			✓	✓			✓		✓		5
	●○○	X											X			2
	○●○		X	X		X	X			X	X				X	7

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
faculty	●○○		✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	11
	○●○	X					X					X				3
	○○●															0

Four-syllable words

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
reality	○●○○						✓							✓		2
	●○○○	X	X	X	X	X		X	X	X	X	X	X		X	12
	○○●○															0
	○○○●															0
politician	○○●○		✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	10
	○●○○	X			X	X				X						4
	●○○○															0
	○○○●															0
discovery	○●○○	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		12
	●○○○					X									X	2
	○○●○															0
	○○○●															0

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
apologize	○●○○		✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	12
	●○○○															0
	○○●○	X														1
	○○○●									X						1
calculator	●○○○		✓	✓	✓		✓	✓	✓		✓	✓		✓	✓	10
	○●○○															0
	○○●○	X				X				X			X			4
	○○○●															0
conversation	○○●○	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	●○○○															0
	○●○○					X										1
	○○○●															0
dictionary	●○○○		✓	✓		✓	✓		✓	✓		✓	✓	✓	✓	10
	○●○○	X			X			X			X					4
	○○●○															0
	○○○●															0

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
geography	○●○○	✓	✓		✓	✓			✓		✓	✓	✓	✓	✓	10
	●○○○															0
	○○●○			X			X	X		X						4
	○○○●															0
economic	○○●○		✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	11
	○●○○	X		X				X								3
	●○○○															0
	○○○●															0
environment	○●○○	✓		✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	12
	●○○○		X													1
	○○●○						X									1
	○○○●															0
electronic	○○●○				✓	✓	✓		✓		✓	✓	✓		✓	8
	○●○○	X	X	X				X		X				X		6
	●○○○															0

	○○○●														0

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
comprehension	○○●○	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	12
	○●○○			X												1
	●○○○						X									1
	○○○●															0
emergency	○●○○		✓			✓	✓	✓		✓	✓		✓	✓	✓	9
	●○○○															0
	○○●○	X		X	X				X			X				4
	○○○●															0
independence	○○●○	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	12
	○●○○				X		X									2
	●○○○															0
	○○○●															0
automatic	○○●○		✓		✓	✓	✓	✓	✓		✓	✓		✓	✓	10
	○●○○	X		X						X			X			4
	●○○○															0

	○○○●														0

Appendix C

WORD STRESS PRODUCTION

Two-syllable words

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
perform	○●	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	●○															0
expect	○●	✓			✓		✓	✓	✓	✓	✓		✓	✓	✓	10
	●○		X	X		X						X				4
Chinese	○●		✓		✓		✓	✓		✓			✓	✓	✓	8
	●○	X		X		X			X		X	X				6
express	○●	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓	12
	●○										X	X				2

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
forest	●○	✓	✓	✓			✓	✓		✓			✓	✓	✓	9
	○●				X	X			X		X	X				5
ocean	●○	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	○●															0
knowledge	●○	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	○●															0
return	○●	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	●○															0
traffic	●○	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	○●															0
challenge	●○	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	○●				X											1
mistake	○●		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	12
	●○	X									X					2
income	●○		✓			✓		✓	✓	✓			✓	✓		7
	○●	X		X	X		X				X	X			X	7

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
unfair	○●	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	13
	●○			X												1
control	○●		✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	11
	●○	X		X			X									3
silence	●○			✓	✓	✓		✓	✓	✓			✓	✓	✓	9
	○●	X	X				X				X	X				5

Three-syllable words

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
vitamin	●○○	✓	✓	✓	✓		✓	✓	✓	✓		✓	✓	✓	✓	12
	○●○					X					X					2
	○○●															0
certainly	●○○		✓		✓		✓		✓			✓	✓	✓		7
	○●○	X		X		X		X		X	X				X	7
	○○●															0
benefit	●○○	✓	✓		✓	✓	✓	✓		✓			✓	✓	✓	10
	○●○			X					X		X	X				4
	○○●															0
volunteer	○○●	✓	✓	✓		✓	✓		✓		✓	✓		✓		9
	●○○				X											1
	○●○							X		X			X		X	4

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
continue	○●○		✓			✓	✓				✓	✓	✓			6
	○○●															0
	●○○	X		X	X			X	X	X				X	X	8
government	●○○	✓	✓		✓	✓	✓		✓	✓		✓	✓	✓		10
	○●○			X				X			X				X	4
	○○●															0
relative	●○○		✓		✓	✓		✓			✓	✓		✓	✓	8
	○●○	X		X			X		X	X			X			6
	○○●															0
calendar	●○○	✓	✓		✓	✓					✓			✓		6
	○●○			X			X	X	X	X		X	X		X	8
	○○●															0
guarantee	○○●	✓	✓		✓		✓	✓			✓	✓	✓	✓	✓	10
	●○○															0

	○●○			X		X			X	X					4

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
elephant	●○○		✓	✓	✓	✓		✓	✓	✓	✓		✓		✓	10
	○●○	X					X					X		X		4
	○○●															0
organize	●○○		✓	✓		✓	✓		✓	✓		✓	✓	✓	✓	10
	○●○	X			X			X			X					4
	○○●															0
manager	●○○	✓	✓		✓	✓	✓	✓	✓	✓		✓		✓	✓	11
	○●○			X							X		X			3
	○○●															0
performance	●○○		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
	○●○	X		X												2
	○○●															0
recommend	○○●				✓			✓	✓			✓		✓		5

	●○○	X										X			2
	○●○		X	X		X	X			X	X				X	7

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
faculty	●○○		✓		✓	✓			✓	✓	✓		✓	✓	✓	9
	○●○	X		X			X	X				X				5
	○○●															0

Four-syllable words

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
reality	○●○○						✓							✓		2
	●○○○	X	X	X	X	X		X	X	X	X	X	X		X	12
	○○●○															0
	○○○●															0
politician	○○●○		✓	✓			✓	✓	✓		✓	✓	✓	✓	✓	10
	○●○○	X			X	X				X						4
	●○○○															0
	○○○●															0
discovery	○●○○	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		12
	●○○○					X									X	2
	○○●○															0
	○○○●															0

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
apologize	○●○○	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	13
	●○○○															0
	○○●○															1
	○○○●									X						1
calculator	●○○○		✓	✓	✓		✓		✓		✓	✓		✓	✓	9
	○●○○															0
	○○●○	X				X		X		X			X			5
	○○○●															0
conversation	○○●○	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	14
	●○○○															0
	○●○○															0
	○○○●															0
dictionary	●○○○		✓	✓		✓	✓			✓		✓		✓		8
	○●○○	X			X			X			X		X		X	6
	○○●○															0
	○○○●															0

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
geography	○●○○		✓		✓	✓			✓		✓			✓	✓	7
	●○○○															0
	○○●○	X		X			X	X		X		X	X			7
	○○○●															0
economic	○○●○		✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	12
	○●○○	X		X												2
	●○○○															0
	○○○●															0
environment	○●○○	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	13
	●○○○															0
	○○●○						X									1
	○○○●															0
electronic	○○●○				✓	✓	✓		✓		✓		✓		✓	7
	○●○○	X	X	X				X		X		X		X		7
	●○○○															0
	○○○●															0

Words	Patterns	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	Total
comprehension	○○●○	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	12
	○●○○			X												1
	●○○○						X									1
	○○○●															0
emergency	○●○○		✓			✓	✓	✓		✓	✓		✓	✓	✓	9
	●○○○															0
	○○●○	X		X	X				X			X				4
	○○○●															0
independence	○○●○	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓	✓	12
	○●○○				X		X									2
	●○○○															0
	○○○●															0
automatic	○○●○		✓		✓	✓	✓	✓	✓		✓	✓		✓	✓	10
	○●○○	X		X						X			X			4
	●○○○															0
	○○○●															0

APPENDIX D

Researcher Profile

Researcher Suthida Soontornwipat

Education PhD. (Linguistics), Chulalongkorn University

M.A. (Linguistics), Chulalongkorn University

B.A. (English), Ramkhamhaeng University

Affiliation Department of English, Faculty of Liberal Arts

Huachiew Chalermprakiet University

Telephone Number 02-312-6300 ext.1431/ 089-515-1883