RESEARCH REPORT

อิทธิพลของรูปแบบการลงเสียงหนักและวรรณยุกต์ในภาษาไทยต่อการกำหนดพยางค์เสียงหนักในคำยืมภาษาอังกฤษของนักศึกษาไทยภาควิชาภาษาอังกฤษ

EFFECTS OF STRESS PATTERNS AND TONES IN THAI ON STRESS PLACEMENT IN ENGLISH POLYSYLLABIC LOANWORDS AMONG THAI STUDENTS IN AN ENGLISH MAJOR PROGRAM

BY

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DHURAKIJ PUNDIT UNIVERSITY

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บทคัดย่อ

งานวิจัยนี้ศึกษาความสามารถของนักศึกษาที่มีสมิทธิภาพทางภาษาอังกฤษแตกต่างกันในการกำหนดการลงเสียงหนักในคำยืมภาษาอังกฤษซึ่งจำแนกตามจำนวนพยางค์ออกเป็นคำยืมประเภท 2 พยางค์ 3 พยางค์ และ 4 พยางค์ และยังศึกษาความสัมพันธ์ระหว่างสามัตถิยะด้านรูปแบบของการลงเสียงหนักในคำยืมดังกล่าวโดยให้กาเครื่องหมายเสียงหนักลงในแบบทดสอบ กับความสามารถในการออกเสียงคำยืมเหล่านี้โดยการอ่านออกเสียง 2 แบบ ได้แก่การอ่านคำยืมในประโยคภาษาอังกฤษและการอ่านคำยืมเป็นคำเดี่ยวๆ นอกจากนี้ยังศึกษาผลกระทบของรูปแบบการลงเสียงหนักและวรรณยุกต์ในภาษาไทยต่อการลงเสียงหนักในคำยืมภาษาอังกฤษของกลุ่มตัวอย่างโดยอาศัยการฟังจากเจ้าของภาษา ผู้เข้าร่วมงานวิจัยได้แก่นักศึกษาชาวไทยที่เรียนภาษาอังกฤษเป็นภาษาต่างประเทศจำนวน 30 คน โดยมีการจำแนกระดับสมิทธิภาพภาษาอังกฤษเชิงเปรียบเทียงออกเป็นกลุ่มที่มีสมิทธิภาพสูงและกลุ่มที่มีสมิทธิภาพต่ำ

ผลการวิจัยพบว่า ในการอ่านคำยืมในประโยค นักศึกษาทั้งสองกลุ่มลงเสียงหนักในคำยืมประเภท 3 พยางค์ได้ถูกต้องมากกว่าคำยืมประเภท 2 พยางค์ และนักศึกษามีปัญหากับการลงเสียงหนักในคำยืมประเภท 4 พยางค์มากที่สุด ส่วนเมื่อให้อ่านคำยืมเป็นคำเดี่ยวๆ พบว่านักศึกษาลงเสียงหนักผิดพลาดมากขึ้นตามจำนวนพยางค์ที่มีเพิ่มขึ้น ในการอ่านแบบคำเดี่ยวๆนี้ ความสามารถในการลงเสียงหนักในคำยืมประเภท 2 พยางค์ของนักศึกษาทั้งสองกลุ่มแตกต่างกันอย่างมีนัยสำคัญ สำหรับการกาเครื่องหมายเสียงหนักลงในคำเพื่อวัดสามัตถิยะของนักศึกษานั้น พบว่านักศึกษาทั้งสองกลุ่มใส่เครื่องหมายเสียงหนักในคำยืมทั้ง 3 ประเภทได้ถูกต้องมากกว่าการอ่านออกเสียงทั้ง 2 แบบ ผลการศึกษายังแสดงให้เห็นว่านักศึกษา 2 กลุ่มมีสามัตถิยะด้านรูปแบบการลงเสียงหนักในคำยืม 3 พยางค์แตกต่างกันอย่างมีนัยสำคัญทางสถิติ

สำหรับการศึกษาความสัมพันธ์ระหว่างการใส่เครื่องหมายเสียงหนักและการออกเสียงคำยืมนั้น ผลการวิเคราะห์พบความสัมพันธ์อย่างมีนัยสำคัญระหว่างการใส่เครื่องหมายเสียงหนักในคำ 3 พยางค์กับการอ่านคำยืมแบบเป็นคำเดี่ยวๆ ส่วนคำยืมประเภท 4 พยางค์ไม่พบความสัมพันธ์ระหว่างการใส่เครื่องหมายกับการอ่านทั้ง 2 แบบ ทั้งนี้อาจสมมติฐานได้ว่านักศึกษาลงเสียงหนักในคำ 4 พยางค์ด้วยการสุ่ม เนื่องจากไม่มีความรู้ในการลงเสียงหนักในคำที่มีมากพยางค์อย่างเพียงพอ

ส่วนการศึกษาผลกระทบของรูปแบบการลงเสียงหนักและวรรณยุกต์ในภาษาไทยต่อการกำหนดพยางค์เสียงหนักในคำยืม พบว่าการอ่านคำยืมประเภท 2 พยางค์ของนักศึกษาได้รับอิทธิพลอย่างมากจากการแทรกแซงของภาษาที่หนึ่ง โดยวรรณยุกต์เสียงตรีเสียงโทและการออกเสียงสระยาวในพยางค์ท้ายของคำซึ่งเป็นคุณลักษณะเฉพาะของการลงเสียงหนักในภาษาไทยอาจนับได้ว่าเป็นสิ่งที่ทำให้เจ้าของภาษาอังกฤษฟังว่าเป็นการลงเสียงหนักในคำภาษาอังกฤษของผู้พูดชาวไทย สำหรับคำยืมที่มี 3 และ 4 พยางค์นั้น คาดว่านักศึกษาอาจทราบว่าเสียงหนักไม่ควรอยู่ที่พยางค์สุดท้ายของคำ โดยเฉพาะเมื่อเป็นคำที่ลงท้ายด้วยพยางค์ปัจจัยที่นักศึกษาพบบ่อย ดังนั้นแม้นักศึกษาอาจจะลงเสียงหนักแบบสุ่ม แต่ก็พบว่ามีนักศึกษาจำนวนน้อยมากที่ใส่เสียงหนักลงในพยางค์ท้าย ผลการศึกษานี้ชี้ให้เห็นว่าการแทรกแซงของภาษาที่หนึ่งจะเพิ่มบทบาทมากขึ้นเมื่อนักศึกษาออกเสียงคำยืมที่ใช้บ่อยในภาษาไทยซึ่งเป็นคำยืมที่มีพยางค์จำนวนน้อยคือมีสองพยางค์และจะเกิดขึ้นเมื่อนักศึกษาออกเสียงโดยไม่ระมัดระวังมากนัก

Title: Effects of Stress Patterns and Tones in Thai on Stress Placement in English Polysyllabic Loanwords among Thai Students in an English Major Program

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Abstract

This study investigates the students' ability, depending on their levels of English proficiency, to locate stress on English loanwords classified according to the number of syllables into: two-syllable, three-syllable and four-syllable loanwords. The study also examines relationships between the students' competence of stress patterns of these loanwords, as measured by the stress marking task, and their ability to pronounce them in two types of oral-reading tasks: (1) reading the target loanwords in English sentences, and (2) reading these words in isolation. In addition, the study also seeks to qualitatively discuss the extent to which stress patterns and tones in Thai affect the stress placement of the target loanwords in oral-reading of the students, as perceived by a native English listener. Participants were 30 Thai EFL students classified into relatively high and low English proficiency groups.

The results reveal that in reading loanwords in sentences, the students in both groups read loanwords with three syllables more correctly than loanwords with two syllables, and they had substantial difficulty with stress in four-syllable loanwords. When reading the list of loanwords in isolation, it was found that the more syllables, the greater degree of incorrect stress placement the students made. In this task, the ability to read loanwords with two syllables between the high and low groups differed significantly. In the stress marking task, students in both groups had the highest degree of correct stress placement in all categories of loanwords. The results show that the two groups differed in their competence of the stress patterns of three-syllable loanwords at a statistically significant level.

With regard to relationships between stress marking and the students' pronunciation of loanwords, statistical testing results reveal a significant correlation only between stress marking and reading the loanwords with three syllables in isolation. For four-syllable loanwords, the results show no significant correlation between stress marking and the oral-reading tasks. It was hypothesized that the students were likely to locate stress randomly on four-syllable loanwords due to insufficient knowledge of stress placement on English words with a high number of syllables.

In terms of the effects of stress patterns and tones in Thai on the resultant patterns of stress placement on loanwords, the results show that the students' performance in reading two-syllable loanwords in sentences was influenced to a great extent by the negative transfer of L1. The high tone, the falling tone and full vowel length on the final syllable, characterized as stress in Thai, may be claimed to be accountable for the native English listener's perception of stress in English words in the speech of Thai speakers. For loanwords containing three and four syllables, students were likely to be aware that stress does not usually fall on the last syllable of these loanwords, particularly when the loanwords contain suffixes that they were familiar with. Thus, although students tended to place stress at random, only a small number of students placed stress on the last syllable. The findings suggest that L1 transfer effect plays a more crucial role when the students pronounce frequently-used loanwords with a small number of syllables in less formal and careful speech.

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CHAPTER I

INTRODUCTION

1.1 Background of the Study

In the 20th century and at the beginning of the 21st, globalization and the increasing contact between countries have made words from other languages enter into another. The practice of adopting foreign words into a language is called 'borrowing', and the 'borrowed' word is known as a 'loanword'. Word borrowing is a two-way process, but often more words go from one side to the other due to some advantage of power, prestige, and/or wealth of the source language community. These days, English words have currently entered into languages of several countries worldwide through numerous channels such as the media, advertising, entertainment, and modern technology, particularly computers and the Internet. This is largely due to the cultural and political predominance of the USA, in particular.

Generally, when a word is newly borrowed into a language, it will sound 'foreign' at first to those who do not know that word. In time, when the word is spoken by a larger speech community, this new foreign word will be conventionalized and become part of more people's linguistic repertoire. At this point, even people who know little or nothing of the source language will understand and even use this new word themselves. Normally, the borrowing language will adapt borrowed words (or loanwords) to fit into its phonological system to a greater or lesser extent. The longer a borrowed word has been in the language and the more frequently it is used, the more it resembles the native words of the language. In languages, which do not have an

identical or very similar writing system to the source language, it is necessary that the word is also adapted to the orthography of the borrowing language.

Thailand is no exception for this word-borrowing phenomenon. For centuries, there was mutual borrowing over a long period of historical contact between Thai and Khmer, as well as Chinese, in terms of cultural, linguistic, and literary sources. There was also borrowing of learned terminology from Pali, Sanskrit, and Chinese into Thai. Basically, Thai is a monosyllabic language. Polysyllabic words in the Thai lexicon are mainly combinations of Thai monosyllables; some are loanwords, and others are combinations of two or more loanwords, or of loanwords and Thai words (Peyasantiwong, 1986:213).

More recently, English loanwords have played an important role in the Thai lexicon. As a result of modern technology from the Western world, English words have been accepted into Thai with an increasing rate of usage, in conversation as well as in writing. The English loanwords in Thai cover a wide range of vocabulary, and in most cases, they have been adapted in various ways to conform to the orthography and pronunciation of the Thai language. These loanwords have characteristics that are primarily determined by the competency of the people who use them. Thai speakers, who also know English or at least enough of it to utilize the relevant word, might pronounce the word in the same or similar way it is pronounced in the source language. But for those who know little or nothing of the source language will retain their L1 phonological system when pronouncing the word.

Linguists and language educators have given considerable attention to the study of loanword phonology, focusing on the borrowing of both segmental features

and suprasegmental features and their correspondences from English to Thai. There have been a number of investigations into the assignment of Thai tones to monosyllabic and polysyllabic English loanwords and the role of stress in Thai (e.g. Gandour, 1976; Nacasakul, 1979; Vairojanavong, 1983; Bickner, 1986; Peyasantiwong, 1986; Kenstowicz & Suchato, 2006). Although these linguists differ in their approaches and opinions, they seem to agree that the syllable in word-final position in Thai polysyllabic words is the most prominent and has strong stress (Vairojanavong, 1983; Peyasantiwong, 1986).

There has also been an interest in studying stress patterns of English polysyllabic words used specifically in some professions like terminologies for medical terms among medical students (e.g. Vairojanavong, 1983; Watanapokakul, 2009). The findings of these studies suggest that errors in the stress placement of these terms were likely to result from the negative transfer of the students' L1. Although these students realized the importance of using word stress correctly, they admitted that they had difficulty with stress placement, and they felt that the more syllables a medical term had, the more difficult it was for them to pronounce the word with the correct stress.

From the experience of the author as an EFL teacher, word stress is one of the major problems in the pronunciation of English among Thai EFL learners due to the different stress patterns between Thai and English. English is a free-stress language (Vairojanavong, 1983); the position of the stress is not fixed in relation to the word. On the contrary, stress in Thai words is fixed and it always falls on the last syllable, irrespective of the number of syllable within a word. In addition to stress, Thai syllables also carry tones which are constrained by syllable type and syllable structure.

When English words are borrowed into Thai, they undergo particular modifications in the mapping process of stress patterns in English and tonal categories in Thai.

Motivated by previous research, this study seeks to investigate stress placement in English polysyllabic loanwords among Thai EFL students in an English Major Program. It aims at examining whether there are differences in the students' ability, depending on levels of English proficiency, to locate the primary stress correctly in two types of speech: (1) reading the target loanwords in English sentences, and (2) reading these loanwords in isolation, as opposed to stress marking on a written test. Moreover, the study also seeks to explore the relationship between the students' competence and performance in the use of stress by comparing their ability to mark stress on these loanwords in the written test against their ability to actually pronounce these loanwords in the oral-reading tasks. Based on the quantitative analyses conducted to carry out the above-mentioned objectives, the ultimate goal of the present study is to qualitatively discuss the extent to which stress in Thai and tonal categories assigned to English polysyllabic loanwords affect the stress placement of these words in the pronunciation of English-Major students as perceived by a native English listener.

1.2 Research Questions

This study sought to answer the following questions:

(1) Depending on levels of English proficiency, are there any differences in the students' ability to locate the primary stress correctly in two types of speech: reading the target loanwords in English sentences, and reading these words in isolation, as opposed to stress marking on a written test?

(2) Are there relationships between the students' competence in locating stress on English polysyllabic loanwords and their performance in actually pronouncing these words in the oral-reading tasks?

(3) To what extent is there an effect of stress patterns and tones in Thai on the resultant stress placement of English polysyllabic loanwords in the pronunciation of Thai EFL students in an English major program as perceived by a native English listener?

1.3 Objective of the Study

The objectives of this study are threefold:

(1) To examine differences in the students' ability, depending on their levels of English proficiency, to pronounce the target loanwords with correct stress placement in two types of speech: reading the target loanwords in English sentences, and reading these words in isolation, as opposed to stress marking on a written test;

(2) To investigate relationships between the students' competence in locating stress on English polysyllabic loanwords in the written test and their performance in actually pronouncing these words when they read them out loud in English sentences and in isolation;

(3) To qualitatively discuss the extent to which stress patterns in Thai and tone adaptation of English polysyllabic loanwords have an effect on the resultant stress placement in the pronunciation of those words in the source language among Thai students in the English major program as perceived by a native English listener.

1.4 Statement of Hypotheses

To carry out the objectives of this study, the following hypotheses were formulated and tested.

(1) The students with relatively higher levels of English proficiency are more aware of the stress patterns of these words in English, and therefore, are more capable of locating stress correctly than those with lower levels of English proficiency, particularly in the stress marking task. However, the more syllables a word has, the more difficult it is for the students to place stress correctly.

(2) The students' competence of the stress patterns of English polysyllabic loanwords may not correlate with their pronunciation of those words in the English source language, suggesting that they have difficulty pronouncing words with correct stress placement.

(3) Stress placement in the pronunciation of English polysyllabic loanwords among Thai students, as perceived by a native English listener, are affected by the stress patterns in Thai and tone adaptation of these loanwords even when these words are pronounced in the context of English sentences.

1.5 Scope of the Study

This study attempts to examine the ability to locate English stress and the effect of Thai stress patterns and lexical tones on English polysyllabic loanwords among Thai learners of English in an EFL context. It is limited to a sample group drawn from the third-year undergraduate students in the English Major Program at Dhurakij Pundit University. The study focuses on examining the students' placement

of the primary stress on thirty frequently used polysyllabic English words borrowed into the Thai language in three conditions: (1) oral-reading these loanwords in English sentences, (2) oral-reading these loanwords in isolation in the source language, and (3) marking the primary stress on each of these loanwords in a written task.

1.6 Limitations of the Study

Due to the fact that the participants consisted of only 30 students in the English Major program of a Thai university, the study is limited by a small sample size. Therefore, the findings may be generalizable only to students sharing similar EFL contexts, and not to students of other English learning contexts.

1.7 Definitions of Key Terms

For the purpose of the study, the key terms are defined as follows.

1.7.1 English as a Foreign Language

English as a foreign language refers to English language learning that takes place where English is neither the native language nor the official language of the society, and where learners have few opportunities to practice the target language outside the classroom. This situation is common in countries such as Thailand, Japan, or Korea, where learning English is usually confined to the classroom.

1.7.2 Standard Thai

The Standard Thai language is the official variety of Thai, which is taught in school, described in grammar books and dictionaries, and used in news broadcasts on radio and television. Standard Thai is spoken by educated speakers in every part of Thailand (Tingsabadh & Abramson, 1993, cited in Tingsabadh & Deeprasert, 1996).

1.7.3 Linguistic Competence

Competence or linguistic competence refers to a language user's underlying knowledge about the system of rules of a language (Owens, 1992). First language (L1) learners normally acquire the specific rules of a language intuitively through extensive exposure to the language in the environment. Second or foreign language learners, on the other hand, often learn language rules from their learning experiences mainly in the classroom environment.

1.7.4 Linguistic Performance

Performance or linguistic performance refers to actual usage of language in normal language users (Owens, 1992). Performance of second or foreign language learners at varying developmental stages usually contain errors caused by several factors such as the transfer of the learner's first language, the transfer of training, strategy of second language learning, strategy of second language communication, and overgeneralization of the linguistic elements.

1.7.5 Loanword

A *loanword* is a word borrowed from a donor language and incorporated into a recipient language directly, without translation. A loanword can also be called a borrowing. Word borrowing often takes place when different language communities come into contact with each other. Loanwords can be roughly divided into: loan transliteration, and loan translation.

(1) Transliteration is the process of converting words or letters from one writing system to another to make equivalent sounds. Most systems of transliteration map the letters of the source language to letters pronounced similarly in the target

language. Thus, loan transliterations, or phonemic loans, refer to foreign words borrowed into another language in both form (pronunciation) and meaning in order to convey information across cultures.

(2) Loan translations, or semantic loans, are foreign words translated into another language to obtain the foreign concepts that did not exist before in the language. While transliteration is representing the pronunciation of a foreign word, translation is the interpreting of the meaning of words. Simply put, translation preserves meaning across different languages, and transliteration preserves both pronunciation and meaning across different languages.

This study focuses only on transliterations of English polysyllabic words used in the Thai language.

1.7.6 Syllable

A *syllable* is a vocal sound or set of vocal sounds uttered with a single uninterrupted articulation. A syllable typically consists of a vowel, diphthong, or syllabic consonant alone, or by any of these sounds preceded, followed, or surrounded by one or more consonants. A syllable either forms a word or an element of a word.

1.7.7 Accent and Stress

The terms ‘accent’ and ‘stress’ are sometimes used interchangeably. According to Luksaneeyanawin (1983, p. 74), these two terms are referred to as two different concepts. *Accent* refers to the potentiality of the syllable or syllables in a word to be realized with stress in a language system either when the word occurs by itself in an utterance or with other words in an utterance. Stress, on the other hand, refers to phonetic features in the actual pronunciation such as loudness, pitch, length,

a higher degree of respiratory effort, etc., as compared with an unstressed syllable (p. 74). Simply put, *accent* is viewed in the abstract, which concerns the phonological system of a language, whereas *stress* is viewed in terms of the actual linguistic behavior in a language user's performance.

For ease of understanding, in this research report the term 'stress' will be used extensively due to two main reasons. First, 'stress' is a more frequently-used term; thus the concept of 'stress' tends to be more widely understandable. Second, this study investigates the students' performance in the oral-reading of English loanwords based on the perception of a native English listener; thus, it deals mainly with the use of 'stress' in the students' actual pronunciation.

1.7.8 Word Stress or Lexical Stress

Stress is the relative emphasis that is given to certain syllables in a word, or to certain words in a phrase or sentence. Stress is typically signaled by such properties as increased loudness, longer vowel duration, full articulation of the vowel, and the rapid change in pitch. Stress at the word level, referred to as word stress or lexical stress, is the stress placed on one syllable of an individual word of two or more syllables. Unstressed syllables are normally said more quietly and with reduced vowels. The position of lexical stress in a word depends on certain general rules applicable in the language.

Word stress can be categorized into: fixed stress and free stress. The fixed stress system applies to languages where all (or the majority of) words bear the primary lexical stress on the same syllable. Examples of fixed stress languages are: Czech (1st syllable stressed), Welsh and Polish (penultimate syllable stressed) and

Thai (final syllable stressed). Free stress, on the other hand, applies to languages where the primary lexical stress is not fixed to a particular syllable. English and Russian are examples of free stress languages.

1.7.9 Lexical Tone

Lexical tone is a fixed underlying pitch pattern carried by a syllable of a word that can distinguish the meaning or grammatical function of that word in a language. A language that uses pitch patterns to distinguish words is often referred to as a tone language, such as Thai, Mandarin, Cantonese, Yoruba, Swedish, and Japanese. Tone assignment in Thai words depends on the syllable type and syllable structure.

1.8 Symbols used in the Study

(1) C represents any one consonant sound

(2) V represents any one short vowel sound or diphthong

(3) VV represents a long vowel

(4) S represents a sonorant consonant sound: /m, n, ŋ, j, w/

(5) O represents an obstruent consonant sound: /p, t, k, ʔ/

(6) (') is used to mark the primary stress in English words as in: com'puter, tech'nology

(7) (O) represents a stressed syllable, and (o) an unstressed syllable

(8) Lexical tones in the standard Thai language are marked by the following symbols:

(`) represents the low tone

(ˆ) represents the falling tone

(´) represents the high tone

(ˇ) represents the rising tone

The mid tone ( ) is not marked by any symbol.

1.9 Significance of the Study

The present study is worth conducting because of the following reasons.

(1) The findings of the study will help teachers and students to become more aware that using the correct word stress patterns is important for speech intelligibility when pronouncing loanwords in the English language context.

(2) The study will provide some insights into the similarities and differences of the stress systems between English and Thai. Knowing the similarities and differences of the English and Thai stress systems and tonal categories should help teachers to develop an informed method to teach word stress patterns in English polysyllabic words.

(3) The teachers can demonstrate to the students how tone assignment on a syllable can affect the perception of stress in English words. That is, using the high tone on unstressed syllable can be perceived as stress misplacement. Therefore, the students need to practice how to use the correct pitch and reduced vowel sound for unstressed syllables and use the high pitch only on the stressed syllable of English words.

(4) The study will provide empirical evidence useful for further research in a similar area.

CHAPTER II

LITERATURE REVIEW

This chapter reviews theories and research studies that are relevant to the present study. It consists of six sections as follows:

(1) The Stress System of English

(2) The Stress System of Thai

(3) Tones and Syllable Structure in Thai

(4) Tone Assignment in English Loanwords

(5) Thai Learners' Errors regarding English Word Stress

(6) Relevant Research Studies

2.1 The Stress System of English

As defined in Chapter 1, there is a distinction between *accent* and *stress*. *Accent* is viewed in an abstract term to refer to a phonological system of a language, which concerns the potentiality of the syllable or syllables in a word to be realized with stress (Luksaneeyanawin, 1983). Knowing which syllable is accented or unaccented depends on the competence of a language user about the underlying rules of a particular language. Such knowledge may be acquired intuitively in L1 speakers or learned consciously by L2 speakers. *Stress*, on the other hand, refers to phonetic features such as loudness, pitch, and vowel length in the actual pronunciation, as compared with an unstressed syllable (Luksaneeyanawin, 1983). Simply put, *stress* is the actual linguistic performance of a language user. The terms 'accent' and 'stress' are sometimes used interchangeably. However, we may see that the word 'stress' is

often used to refer to both concepts. For ease of understanding, the term ‘stress’ will be used extensively in this study due to the fact that the investigation focuses mainly on the students’ actual performance in the placement of ‘stress’ on English loanwords as perceived by a native English listener. Moreover, the term ‘stress’ is more frequently used and thus it tends to be more widely understandable.

Before describing the English stress system, it is necessary to firstly define the term ‘syllable’. A syllable is a vocal sound or set of vocal sounds uttered with a single uninterrupted articulation (Dictionary.com, 2016). A syllable consists of a vowel (V) sound plus any consonant (C) sounds that occur before or after it or both. The general structure of a syllable consists of three parts: the onset, the nucleus, and the coda. The nucleus is usually a vowel; the onset is what comes before the nucleus, and the coda is what comes after it. Only the nucleus always exists. Many languages allow syllables with empty codas (i.e. no consonants after the nucleus), which are referred to as ‘open’ syllables. Those that contain codas are called ‘closed’ syllables. Most languages also allow empty onsets (no consonants before the nucleus).

An English word can have one or more syllables. In English words of two or more syllables, not all the syllables are pronounced with equal force or energy. One of the syllables is pronounced louder, with longer duration and a higher pitch than the other syllables in that word. Simply put, in order for one syllable in a word to be perceived as a stressed syllable, the syllables around it need to be unstressed. For example, in the word *furniture*, the first syllable is stressed. This logically implies that the final two syllables are unstressed. Also, in the word *computer*, the second syllable is stressed. This means that the first and third syllables are unstressed. Syllables that

are unstressed are pronounced softly with the vowel changing the quality from a full vowel to a short weak vowel /ə/ or /ɪ/.

There are at least three degrees of stressed syllables in English: *primary*, *secondary*, and *weak*. The primary stress is the strongest or loudest stress in a word. In the English stress system every word must have one primary stress. The secondary stress usually appears in words that have three or more syllables. Contrary to the louder primary stress and the lighter weak stress, a syllable with secondary stress is often pronounced at normal speaking level. The word *carbohydrate*, for example, has the primary stress on the third syllable and secondary stress on the first syllable. A syllable with weak stress is pronounced a little softer than normal speaking level. Normally, the vowel in an unstressed syllable is reduced to either the schwa /ə/ or the high front vowel /ɪ/. The change in vowel quality from a stressed full vowel to a short central vowel /ə/ or /ɪ/ is called *vowel reduction* or *vowel centralization* of unstressed vowels.

From what has been described as the nature of stress, one can conclude that a listener often hears a stressed syllable as being louder than the other syllables in the word. A stressed syllable is often on a higher pitch and it has a longer duration, that is, the vowel appears to be longer. Additionally, the quality of the same vowel used in a stressed syllable and an unstressed syllable is different.

English is classified as a *free-stress* language. This means that the position of the stressed syllable is not fixed in relation to the word. In languages like Hungarian, or Czech, for instance, the first syllable of the word is always stressed. In French and Turkish, it is the last syllable that is stressed. Thai words also have the primary stress

on the last syllable, irrespective of the number of syllables in the word. Such languages are said to have a *fixed-stress* system. In some other languages, however, stress may not be a property of the word at all (Ladefoged, 1975, cited in Luksaneeyanawin, 1983).

As a free-stress language, a stressed syllable in English words is unpredictable, and there is no symbol in the English writing system that indicates which syllables are stressed. How, then, do people know which syllable in a word should be said with stress? Normally, speakers of English simply have to remember where the stress has to be placed in each word. Foreign students of the language may have difficulty, but they may look up the pronunciation of words in a dictionary to find out where the stress symbols are marked. Generally, two symbols are used: the symbol (ˈ) is marked before the syllable that receives the primary stress, and (ˌ) is marked in front of the syllable which receives the secondary stress. Syllables with weak stress are usually not marked at all.

Although stress is not fixed on a certain syllable in an English word, there are a few general rules that provide a 'rough guide' to stressed syllables. In fact, these are descriptions of tendencies rather than definite rules. They merely tell what is true most of the time, but not all the time, because it is always possible to find exceptions. The following are some common rules for stressed syllables in English polysyllabic words, which can be divided into five categories: core vocabulary, words with prefixes and suffixes, reflexive pronouns, compound words, and phrasal verbs (Kelly, 2003; Hancock, 2003; โชติกเสถียร, 2537).

(A) Core Vocabulary

(1) Stress the first syllable of two-syllable nouns: ˈsister, ˈwater, ˈtable, ˈcoffee

(2) Stress the root of two-syllable verbs and adjectives:

(a) the root is the first syllable

Verbs: ˈharden, ˈsuffer, ˈoffer, ˈfinish, ˈpunish, ˈdamage

Adjectives: ˈuseful, ˈsudden, ˈthirsty, ˈjealous, ˈpleasant, ˈsolid

(b) the root is the second syllable

Verbs: beˈgin, conˈclude, deˈfine, disˈcard, emˈploy, preˈsent

Adjectives: comˈplete, disˈtinct, exˈtreme, inˈtense, preˈcise

(3) Words having a dual role of being either a noun or a verb

(a) The noun tends to be stressed on the first syllable, as in ˈimport, ˈincrease, ˈrebel, ˈconduct, ˈpresent, ˈsubject, ˈprogress, ˈobject.

(b) The verb tends to be stressed on the last syllable, as in imˈport, inˈcrease, reˈbel, conˈduct, preˈsent, subˈject, proˈgress, obˈject.

(4) For other types of words with two syllables such as adverbs and prepositions, stress is usually on the root of these words, as in: aˈbove, beˈlow, beˈfore, inˈdeed, unˈtil, exˈcept, ˈoften, ˈlater, ˈbetter, ˈquickly.

(B) Words with Prefixes and Suffixes

(1) Prefixes and suffixes are usually not stressed in English. Consider words such as: ˈquietly, oˈriginally, deˈfective, and so on.

(2) When the prefixes *anti–, bi–, de–, dis–, en–, ex-, in–, non–, re–, sub–, trans–*, and the suffixes *–able, –al, –ful, –ize, –ish, –ism, –less, –ly*, and *–y*

are added to English words, the position of the primary stress often remains on the same syllable of the base words, as in: decom'pose, disap'prove, en'danger, in'active, none'xistence, sub'conscious, de'lightful, 'selfish, 'valueless, im'mediately, 'mastery.

(3) Words ending in certain suffixes such as *–ic, –ical, –ity, –ious, –eous, –ual, –ion,–ian, –itude, –ify, –logy* and *–graphy*, receive the primary stress on the syllable immediately before these suffixes, as in: enthusi'astic, po'litical, i'dentity, con'tagious, spon'taneous, indi'vidual, infor'mation, co'median, 'magnitude, per'sonify, physi'ology, pho'tography.

(4) Most words ending with *–ate* and *–ive* are usually stressed on the third syllable from the last, as in: ap'preciate, con'siderate, e'valuate, 'relative, in'formative, com'petitive.

(5) If the syllable preceding *–ive* is a closed syllable, the primary stress falls on the syllable before *–ive*, as in: des'criptive, con'structive.

(6) Words ending in *–ee, –eer, –ese, –ette, –esque, –nique* carry the stress on the suffix itself, as in trai'nee, engi'neer, Chi'nese, ciga'rette, pictu'resque, u'nique.

(C) Reflexive pronouns

Reflexive pronouns ending in *–self*, or *–selves* have the stress on the last syllable, as in my'self, him'self, them'selves, our'selves, etc.

(D) Compound words

(1) Compound nouns carry the primary stress on the stressed syllable of the first part, as in ˈpostman, ˈnewspaper, ˈwastebasket, ˈtablecloth.

(2) Compound adjectives have the primary stress on the stressed syllable of the second element, as in bad-ˈtempered, self-ˈcentered.

(E) Phrasal verbs

The particle (preposition) in a phrasal verb receives stronger stress than the main verb in the group, as in pick ˈup, turn ˈoff, drop ˈout, put aˈway.

2.2 The Stress System of Thai

Thai is said to be a monosyllabic language, but there are numerous polysyllabic words in the Thai lexicon. Some of these polysyllabic words are found to be the combinations of Thai monosyllables, and some are loanwords, or the combinations of two or more loanwords. Others are combinations of loanwords and native Thai words. These polysyllabic words have been modified in various ways to conform to the Thai phonological and orthographical systems (Peyasantiwong, 1986).

Unlike English, Thai is a fixed-stress language. In Thai, the last syllable always has the strongest stress, irrespective of the number of syllables in the word. Secondary stress and tertiary stress in Thai polysyllabic words are also fixed on certain syllables, but they can be optional in regular speech tempo or in fast speech. A stressed syllable in Thai words has similar characteristics as an English stressed syllable, that is, it is perceived as louder than the other syllables in the word and the vowel appears to be longer than when the same vowel occurs in unstressed syllables.

Like stress in English, there is a change in the vowel quality when a certain vowel appears in a stressed syllable and an unstressed syllable. Peyasantiwong (1986) discussed three linguistic factors relating to stressed and unstressed syllables in Thai:

(1) vowel shortening

(2) glottal stop deletion

(3) tone neutralization

2.2.1 Vowel Shortening

The first factor relating to the stress system in Thai words concerns vowel shortening, which occurs in both long and short vowels. The reduction of vowels in length is commonly found in compound words in which the first syllable has a shorter vowel than its original form when spoken with regular speech tempo. Both long and short vowels are reduced to about half of their original length. Diphthongs are also reduced in duration. Examples of vowel shortening are:

(1)	náam + taa	= nám taa	(tear - noun)
	pàak + kaa	= pàk + kaa	(pen)
	rooŋ + rian	= roŋ + rian	(school)
	dɔ̀ɔk + máay	= dɔ̀k + máay	(flower)
	săa baan	= să baan	(swear)
	loo hìt	= lo hìt	(blood)

The compound forms in (1) can be either words made up of two monosyllables, each of which has its own meaning and can occur by itself, or words that contain more than one syllable and neither syllable can stand on its own. In each example above, the first syllable is pronounced with a shorter vowel, while the second

syllable maintains the original vowel length. Peyasantiwong (1986) referred to the vowel shortening process in the first syllable as having ‘weak’ stress.

2.2.2 Glottal Stop Deletion and Tone Neutralization

As tone neutralization normally occurs when the final glottal stop is dropped (Peyasantiwong, 1986), the two processes will be discussed in relation to one another. According to the rules of the Thai spelling system, syllables with a short vowel that have no final consonant will be pronounced with a glottal stop (i.e. having the structure CVʔ). These syllables can be assigned either low tone (`) or high tone (´), depending on the category of the initial consonant letter used to spell the syllable. When these syllables are in non-final position, the final glottal stop is normally deleted and the tone is neutralized (i.e. reduced to mid tone). For example,

(2)	tʰáʔ lee	= tʰa lee	sea
	kʰáʔ nɛɛn	= kʰa nɛɛn	marks, points
	máʔ naaw	= ma naaw	lime
	láʔ kʰɔɔn	= la kʰɔɔn	stage play
	cʰáʔ nii	= cʰa nii	gibbon
	pràʔ thêet	= pra thêet	country
	tʰàʔ nǒn	= tʰa nǒn	road
	kùʔ làap	= ku làap	rose
	tàʔ puu	= ta puu	nail (noun)
	sàʔ ʔàat	= sa ʔàat	clean

The two forms of pronunciation from the above examples are referred to by Peyasantiwong (1986:220) as ‘underlying form’ and ‘surface form’. The term ‘underlying form’ refers to the pronunciation based on the spelling rules of the language. The term ‘surface form’, in contrast, refers to the actual pronunciation of a particular word spoken in isolation by a native speaker of the (borrowing) language at regular speech tempo. Thus, the pronunciation of words in the left column represents the underlying forms, while their corresponding surface forms in the right column illustrate the final stop deletion and tone neutralization occurring in the first syllable of each word.

Considering the examples in sets (1) and (2), vowel shortening and tone neutralization occur in syllables that are in non-final position in a word. These syllables are said to have weak stress. Many linguists (Gandour, 1976; Luksaneeyanawin, 1983; Vairojanavong, 1983; Peyasantiwong, 1986) tend to agree that the syllable in word-final position normally has strong stress and is pronounced prominently with full vowel length. The rule of ‘stress on the final syllable’ seems to apply in all polysyllabic Thai words (Peyasantiwong, 1986:224).

In words containing more than two syllables, one usually finds the first or second syllable is reduced in fast speech. Peyasantiwong (1986) divided stress in Thai words into three levels: *weak stress, reduced stress,* and *full stress,* with the word-final syllable always receiving full stress. Weak stress is given to the syllable containing a short vowel and a final glottal stop (i.e. having the structure CVʔ) in the underlying form; reduced stress is placed on the remaining syllable that is not word-final and does not have the structure CVʔ. In polysyllabic words containing more than

one CVʔ syllable in non-final position, these CVʔ syllables are pronounced with reduced stress in fast or even regular speech tempo, that is, the final glottal stop is often dropped but the original tone may or may not be neutralized, depending on the style and preference of each individual speaker. The main point that should be noted here is that the word-final syllable in polysyllabic words in Thai always receives strong stress, whereas the syllable in non-final position receives either weak or reduced stress, depending on the syllable structure.

From what has been discussed so far, the general rules for syllables to be stressed in Thai words can be summarized as follows:

(1) For monosyllabic words, content words are normally stressed, whereas grammatical words are often unstressed unless they are specifically intended to be emphasized by the speaker.

(2) More than one syllable in most polysyllabic Thai words can be stressed, but the strongest stress always falls on the last syllable. The secondary stress of the word normally falls on the first or second syllable. In fast speech, the secondary stress may be reduced to become weak stress, while the primary stress always exists on the last syllable in all types of speech (Vairojanavong, 1983: 80).

(3) While the primary stress is always on the final syllable, the position of the secondary stress is assigned based on the syllable structure of the word. In compound words, for example, the secondary stress will appear on the stressed syllable of the first element. The stressed syllable of the second element always receives the primary stress (Vairojanavong, 1983: 80).

It can be seen that the stress systems in English and Thai share some common characteristics. For instance, a stressed syllable in both languages is normally perceived as louder, and longer in vowel duration than the other syllables in the word. In addition, there is also a change in the vowel quality when a certain vowel is pronounced with a strong stress as opposed to a weak stress. However, with regard to the position of stress in polysyllabic words, one can find a number of contrasting rules between the two languages that seem to cause difficulties for Thai learners to pronounce polysyllabic English words with correct stress placement as follows:

(1) While the Thai stress system is right-handed, the English system is left-handed. That is, the strongest stressed syllable is always the last syllable in Thai words, irrespective of the number of syllables in the word. On the contrary, the first syllable of the majority of English words with two syllables is usually stressed, while many English words having more than two syllables carry the strong stress on the first or second syllable.

(2) Due to the fact that Thai is a tone language, each syllable is assigned a fixed pitch level based on the syllable structure and the position of the syllable in the word. Some syllables are assigned high tone, some low, while others falling or rising. (This will be discussed in the following section.) English, on the other hand, has no lexical tone on syllables. Only a stressed syllable is pronounced with a relatively higher pitch than the other syllables in the word. When words are borrowed from other languages into Thai, these words are normally assigned tonal categories in a similar manner that tones are assigned to Thai words.

Based on the differences in the systems of the two languages, a problem often arises when a high tone is assigned to an unstressed syllable of English loanwords according to the Thai rules. When a Thai speaker pronounces an unstressed syllable in the high tone, a native English listener tends to perceive it as a stressed syllable because the high pitch is one major characteristic of English stress. In addition, since stressed syllables in English words are unpredictable, many Thai learners often have difficulty using the correct pitch levels for the primary stress, secondary stress, and weak stress in different positions of English polysyllabic words. Such competing strategies in the application of stress patterns between the two different stress systems are challenging for Thai EFL learners.

2.3 Tones and Syllable Structure in Thai

Thai is a tone language. There are five contrastive lexical tones in Standard Thai: mid ( ), low (ˋ), falling (ˆ), high (ˊ), and rising (ˇ) as shown below. Note that the mid tone is not marked by any symbol.

(3)	/naa/	mid	‘field’	
	/nàa/	low	(a nickname)	
	/nâa/	falling	‘face’	
	/náa/	high	‘aunt’	
	/nǎa/	rising	‘thick’	(Gandour, 1979: 134)

The distribution of lexical tones in Thai is constrained by syllable type and syllable structure (Gandour, 1979). As defined in the previous section, a syllable consists of a vowel (V), which may be preceded, followed, or surrounded by one or

more consonants (C). The syllable structures of Thai words are schematized into two main types:

(1) 'Smooth' syllables, which are syllables ending in a long vowel (VV) or in a sonorant (S) segment, i.e. /m, n, ŋ, j, w/: CVV, CVS, CVVS;

(2) 'Checked' syllables, which are syllables ending in a non-sonorant or obstruent (O) segment, i.e. /p, t, k, ʔ/.

All five tones may occur on smooth syllables. On checked syllables with a long vowel, only the low and falling tones are permitted, while the high and low tones are allowed on checked syllables with a short vowel (Gandour, 1979).

Table 2.1: *Syllable Type, Syllable Structure, and Tones in Thai*

Syllable Type	*Syllable Structure*	*Tones in Thai Words*
'smooth' syllables	CVV, CVS, CVVS S = m n ŋ w j (sonorant segment)	H, M, L, F, R
'long checked'	CVVO O = p t k (obstruent segment)	L, F
'short checked'	CVO O = p t k ʔ (obstruent segment)	H, L

2.4 Tone Assignment on English Loanwords

English loanwords that enter into Thai are normally adapted to fit into the Thai phonological system. These loanwords also undergo constraints on the distribution of Thai lexical tones. However, such constraints are not identical to those that apply to Thai lexical items. For instance, the high, low, and rising tones do not occur on smooth syllables in English loanwords; only the mid and falling tones are permitted. On long checked syllables, the high and low tones occur, but not the falling tone. The

high tone, which is prohibited on long checked syllables in standard Thai vocabulary, does occur on this type of syllable in loanwords. On short checked syllables, both the high and low tones, which occur in Thai words, are permitted in English loanwords in addition to the falling tone, which is prohibited on short checked syllables in Standard Thai, as shown below.

Table 2.2: *Syllable Type, Syllable Structure, Tones in Thai and English Loanwords*

Syllable Type	*Syllable Structure*	*Tones in Thai Words*	*Tones in English Loanwords*
'smooth' syllables	CVV, CVS, CVVS S = m n ŋ w j (sonorant segment)	H, M, L, F, R	M, F
'long checked'	CVVO O = p t k (obstruent segment)	L, F	H, L
'short checked'	CVO O = p t k ʔ (obstruent segment)	H, L	H, L, F

Gandour (1979) presented general rules for the assignment of Thai tones on English monosyllabic and polysyllabic loanwords, which will be summarized in the following sections.

2.4.1 Tone Assignment on Monosyllabic Loanwords

The assignment of tones on monosyllabic words depends solely on the syllable structure. According to Gandour (1979), smooth syllables are assigned mid tone, while checked syllables, short or long, are assigned high tone.

Monosyllabic loanwords having final consonant clusters often go through the simplification of final consonant cluster process. As the Thai language does not

accommodate final consonant clusters, Thai speakers normally simplify the final consonant clusters in English words by pronouncing only the first sound in the cluster. Therefore, words like *bank, pump,* and *tent*, which contain final clusters ending in a non-sonorant (obstruent) segment /k/, /p/, and /t/, are pronounced by Thai speakers with a single final sound as /bǽŋ/ /pám/ and /tén/, respectively. When these loanwords are pronounced by Thai speakers with a sonorant final segment /ŋ/, /m/, and /n/, such pronunciation leads us to expect that these words should conform to the rules for smooth syllables and therefore should be assigned mid tone. Yet, since these words are actually pronounced with high tone, it may be assumed that the assigned tone (i.e. the high tone) is based on the English syllable structure prior to the eventual phonetic simplification of the corresponding Thai syllable structure. It is also worth noting here that in the transliteration process of these words from English into Thai, the second segment in the cluster is maintained in the Thai orthography, probably to indicate the original spelling of these English words. Based on this phenomenon, the tonal assignment of these loanwords may be hypothesized to occur as regards the transliteration of the English syllable structure prior to the simplification of final consonant clusters in the Thai pronunciation.

Another constraint occurring in the assignment of tone to English monosyllables is found in the differences between vowels and diphthongs in Thai and English. For instance, the words ‘pipe’ and ‘mouse’ contain diphthongs /ɑɪ/ and /ɑʊ/ and the final sound /p/ and /s/, respectively. In Thai, the diphthong /ɑɪ/ is said in a single vowel /a/ followed by a final consonant /j/. Likewise, the diphthong /ɑʊ/ is pronounced in /a/ and the final consonant /w/. Since Thai does not accommodate final

clusters in the language, the final sounds /p/ and /s/ cannot occur in a cluster with /j/ and /w/. As a result, /p/ and /s/ are simply dropped out, and the words ‘pipe’ and ‘mouse’ are normally pronounced by Thai speakers as /páj/ and /máw/, respectively.

As a matter of fact, the Thai pronunciation of /páj/ and /máw/ exhibits smooth syllable structures (i.e. CVS), and they should be assigned mid tone. Instead, they are pronounced with the high tone. We may again assume that the assignment of high tone on these words corresponds to the English syllable structure for words ending in a non-sonorant (obstruent) segment: /pɑɪp/ and /mɑʊs/.

There are monosyllabic words in English which are restructured in Thai as disyllabic loanwords due to constraints on initial consonant clusters in Thai. As Thai does not accommodate initial clusters beginning with the alveolar fricative /s/, English monosyllabic loanwords such as *stamp, smart, steak, switch,* etc. have to be modified to meet this restriction. Typically, the vowel /a/ will be inserted between the two sounds in the clusters, resulting in an addition of a syllable in the Thai pronunciation. Thus, *stamp, smart, steak,* and *switch* are pronounced in Thai as: /sa tɛm/, /sa máat/, /sa ték/, and /sa wít/, respectively. The second syllable of these disyllabic loanwords follows the rules already established for monosyllables, that is, mid tone on smooth syllables, and high tone on checked syllables. The first syllable in the Thai pronunciation of these words carries the mid tone as a result of the glottal stop deletion and tone neutralization rules on CVʔ syllables when spoken at regular speech tempo. Tone neutralization will be discussed in greater detail in the next section.

2.4.2 Tone Assignment on Disyllabic Loanwords

In the assignment of tone on disyllabic loanwords, the first syllable of a word follows the rules already established for monosyllables, that is, mid tone on smooth syllables, and high tone for checked syllables. The assignment of tone on the second syllable is different. Instead of the mid tone, the falling tone is assigned for smooth syllables, as shown:

(4)	ˈtaxi	/tʰɛ́k sîi/	ˈlaser	/lee sə̂ə/
	ˈdollar	/dɔn lâa/	ˈfashion	/fɛɛ cʰân/
	ˈquota	/kʰwoo tâa/	ˈbowling	/boo lîŋ/

According to Gandour (1979), the assignment of the falling tone on the final syllable of disyllabic loanwords could be due to a phonetically-motivated account in terms of English and Thai stress patterns. The stressed-unstressed pattern in English, as in ˈ*taxi,* ˈ*dollar,* ˈ*quota,* ˈ*laser,* ˈ*fashion,* ˈ*bowling*, correlates with a falling pitch contour (i.e. rising and falling). It may be hypothesized that this rising-falling pitch contour is possibly preserved in the Thai pronunciation, but the point of the falling is shifted to the final syllable due to the fact that the stress pattern in Thai requires stress on the last syllable of polysyllabic words.

This phonetically-motivated explanation may not be applicable to all cases for the stressed-unstressed pattern of English loanwords. The second syllable of disyllabic loanwords that ends in an obstruent segment exhibits two different patterns in the Thai pronunciation. In (5), the high tone is assigned to the second syllable, and in (6) the checked syllables at the end of the loanwords are assigned the low tone.

(5)	ˈsandwich	/sɛn wít/	ˈdonut	/doo nát/
	ˈbonus	/boo nát/	ˈvirus	/waj rát/
	ˈtennis	/tʰen nít/	ˈoffice	/ʔɔ́p fít/
(6)	ˈconcrete	/kʰɔn krìit/	ˈtechnique	/tʰek nìk/
	ˈcredit	/kʰree dìt/	ˈhotdog	/hɔ́t dɔ̀ɔk/

All English words in (5) and (6) have the primary stress on the first syllable, and they all display a falling pitch contour. In the borrowed forms in Thai, these two sets display different tonal adaptation patterns. In (5), the Thai tone adaptation on the second syllable follows the rules already established for checked syllables on which they are assigned the high tone. In (6), the adaptation of tone on the second syllable does not follow the rules established for checked syllables. Rather, the tonal adaptation for this set of words more closely approximates the English stress pattern. That is, the checked syllables at the end of the loanwords are assigned low tone, which corresponds to the low pitch on the unstressed second syllable of these words in English. The assignment of low tone on the second syllable appears to be phonetically-motivated to approximate the English stress pattern.

2.4.3 Tone Assignment on Loanwords with More Than Two Syllables

According to Gandour (1979), the rules for tonal assignment on loanwords consisting of more than two syllables are based mainly on the English syllable structure. Smooth syllables are assigned mid tone in non-final position, and falling tone in final position. Checked syllables receive the high tone in non-final position, and low tone in final position. Short open syllables in English source words occurring between a primary stressed syllable and a following syllable are assigned mid tone in

accordance with the tone neutralization rule in Thai. The following are examples of three-syllable loanwords.

(7)	ˈcalorie	/kʰɛɛ lɔ rîi/	ˈfurniture	/fəə ni cə̂ə/
	ˈbattery	/bɛ́t tə rîi/	comˈputer	/kʰɔm piw tə̂ə/
	peˈtroleum	/pi tro lîam/	corˈruption	/kʰɔɔ ráp cʰân/
	roˈmantic	/roo mɛn tìk/	ˈCadillac	/kʰaa di lɛ̀k/

There are other English loanwords which do not fit in the above categories in terms of the tonal adaptation of English stress patterns, as shown in (8).

(8)	ˈmicrowave	/maj kʰroo wéep/	ˈHollywood	/hɔɔ li wúut/
	ˈalcohol	/ʔɛɛn kɔɔ hɔɔ/	bacˈteria	/bɛ̀k ti ria/

From the rules of tonal adaptation presented thus far, Gandour (1979) concluded that both phonetic and non-phonetic factors are involved in determining the eventual tonal representation of English stress patterns in the borrowed forms in Thai. He summarized the rules of Thai tone adaptation that apply to the majority of English loanwords, as shown in Table 2.3.

Table 2.3: *Tonal Assignment on English Loanwords in Thai*

Syllable Type	*Monosyllabic words*	*Polysyllabic words*	
		Non-final position	*Final position*
‘smooth’ syllables	mid	mid	falling
‘checked’ syllables	high	high	low, falling

(Gandour, 1979: 142)

2.5 Thai Learners' Errors Regarding English Word Stress

In the language learning process, learners tend to make errors at varying stages. Selinker (1972) claimed that these errors are caused by one or more of the five psychological processes: transfer of the learner's first language (L1), transfer of training, strategy of second language learning, strategy of second language communication, and overgeneralization of the target language linguistic elements.

First Language (L1) Transfer refers to the phenomenon when there is a carry-over of items or patterns from the learner's first language (L1) to the second language (L2). The effects of L1 transfer can be both positive and negative. If a form in an L2 resembles a form in the learner's L1, the transfer is likely to yield a positive effect. On the contrary, when the patterns or systems of the two languages differ, learners tend to make errors that are mainly influenced by their first language (L1). This situation is referred to as negative transfer or L1 interference. Negative L1 transfer is often referred to as the major source of learners' errors when their L1 does not have this form or when the systems of an element in L1 and L2 are different. However, when errors appear, it does not always mean that the learners apply their first language rules. Many errors can be caused by one or more of the following factors.

Transfer of training refers to the situation where learners' errors are influenced by what they have learned in the second language classroom, and where the learners might have formed incorrect concepts of some problematic elements that they learned from their teachers.

Strategy of second language learning refers to the situation where the learners try to simplify complicated concept in a second language. For instance, a learner who

is familiar with the verb "feel" in its *–ing* form may have a concept that this verb has to end with *–ing*. As a result, this learner tends to continually add *–ing* to this verb, as in the sentence "I'm feeling hungry."

Strategy of second language communication is the strategy that learners use when communicating in a second language. For example, the learner may refrain themselves from language difficulties by avoiding difficult vocabulary, structures or unfamiliar linguistic elements. This strategy is commonly referred to as '*avoidance strategy*'.

Overgeneralization of the target language linguistic elements is normally found when a learner tries to apply a rule that he or she has learned to every situation. For example, when learners have learned the rule of adding *–ed* to English verbs to indicate the past tense, they overgeneralize this rule to include irregular verbs. As a result, errors such as *goed*, *runned* and *swimmed* may appear at an early stage in the learners' interlanguage development.

In terms of word stress, the learners' stress patterns on English words may be affected by one or more of the above factors. One major cause is hypothesized to arise from the differences in the stress systems between L1 and L2, resulting in the negative transfer of the learners' L1 on their pronunciation of polysyllabic English words. This study focuses on the similarities and differences of the English stress system as opposed to the stress and lexical tones in Thai and explores how stress and tones in Thai affect the stress placement in English polysyllabic loanwords in the pronunciation of Thai university students as perceived by a native English listener.

2.6 Relevant Research Studies

The study of loanword phonology has received considerable attention from several linguists and language educators. Much research has focused on the borrowing of both segmental features and suprasegmental features and their correspondences from English to Thai. Gandour (1976), for example, investigated the rules for converting the stress patterns of English into Thai tonal categories and examined the extent to which the resultant tonal patterns can be accounted for in terms of the pitch contours associated with the English stress patterns. In his study, he explored the assignment of tones to monosyllabic and polysyllabic English loanwords and proposed that both phonetic and non-phonetic factors interact in determining the eventual tonal representation of English stress patterns. He then summarized the rules for assigning tones, which can be applicable to the majority of English loanwords in Thai, as presented in the earlier section.

Nacasakul (1979) pointed out the basic characteristics of English loanwords and how they are naturalized into the Thai language at various stages in the Thai history. She discussed the syllabification of the borrowed words, the realization of the initial and final phonemes as well as vowel phonemes, and the assignment of tones for Thai pronunciation. She concluded that since the process of borrowing had still undergone various states of change, it was difficult to lay down a definite formulation for the characteristics of the English loanwords in Thai.

Following Gandour's and Nacasakul's works, Bickner (1986) proposed some explanations for tone assignment in English borrowings. He suggested that the assignment of tones in the Thai pronunciation of English loanwords was likely to

result from the two likely routes through which these words entered Thai, that is, through speech and through writing. For some English words entering Thai through speech, tone adaptation was likely to be the product of imitation of stress and intonation from the English source words. On the other hand, the Thai pronunciation of other English loanwords entering Thai through writing may follow the rules of Thai spelling and may be the result of pronunciation of a transliteration.

Peyasantiwong (1986) discussed the roles of stress in monosyllabic and polysyllabic loanwords in Thai by illustrating their 'underlying form' and 'surface form'. While 'underlying' form refers to pronunciation based on the spelling rules of the language, the term 'surface form' refers to the actual pronunciation a native speaker will give when asked how a particular word is said. In her paper, rules and examples are provided to illustrate the need for examining stress in Thai from various points of view, especially from the morphological and semantic considerations, in order to fully explain the situation.

A more recent work in loanword adaptation from English into Thai was conducted by Kenstowicz and Suchato (2006), reporting major results from an analysis of an 800-word corpus of loanwords from English into Thai. The study focused on the context-free adaptation of consonants, the correspondences between consonant sounds of the two languages, adaptations to accommodate Thai syllable structure, and the selection of tones for loanwords. Concerning the adaptation into the Thai prosodic structure, the study reported that the final syllable of loanwords bears a major stress and is required to be a heavy syllable. For the most part, tone is assigned in terms of two rules: (1) syllables ending in a sonorant take the mid tone; and (2)

syllables ending in an obstruent take the high tone. The results confirm the rules of tonal assignment summarized in Gandour's (1979) study.

There has also been an interest in examining stress patterns of English polysyllabic words used specifically in some professions like terminologies for medical terms. Vairojanavong (1983) made a contrastive study of the stress systems of English and Thai and presented an error analysis of the stress patterns in 19 English polysyllabic medical terms pronounced by resident doctors and medical students. Her findings suggest that most errors were caused by L1 interference, as stress patterns in Thai are fixed while English is a free stress language. Only 4% of the words were stressed correctly. Interestingly, resident doctors who were more familiar with those medical terms made more interference errors than medical students who were less familiar with the same medical terms. It may therefore be inferred that, though medical students and physicians use English medical terms throughout their studies and career life, correct word stress seems to be ignored.

Watanapokakul (2009), in the study of word stress in polysyllabic medical terms, found that the more syllables a medical term has, the more difficult it is for medical students to pronounce. However, the findings show that the medical students' ability to identify stress patterns of English medical terms correlated with their ability to pronounce the same terms, suggesting a positive relationship between the competence and performance of the students. From the questionnaires asking for opinions on the importance of word stress placement in medical terms, the results reveal that most students thought that they had insufficient knowledge about English word stress patterns, but they realized the importance of using word stress correctly,

as the incorrect use of word stress can have negative effects on their profession and communication.

From what has been reviewed so far, a great amount of research on loanword phonology has focused on the adaptation of both segmental features and supra-segmental elements from the source language to the borrowing language phonology. Research also studied errors in the pronunciation of words regularly used in some professions through contrastive analysis of L1 and L2 language systems and found the effect of L1 interference on the part of the stress patterns. From those studies, one may find that the main characteristic of stress in English is the rapid change of pitch toward a relatively higher level. In Thai, on the contrary, a stressed syllable is recognizable by the longer duration of the vowel sound when compared with the same vowel occurring in an unstressed syllable. The pitch level in Thai words is not the characteristic of stress, but it is the main feature of lexical tones which are assigned to all syllables in a word according to the syllable structure, irrespective of stress. The primary stress in Thai words is always on the last syllable no matter which tone it carries. By the same token, a Thai syllable with the high tone, or high pitch, can be either stressed or unstressed, and it can occur at any position in a word, final or non-final. Due to the fact that the stress system in English and the stress and tonal systems in Thai share some similarities and differences, it can be expected that there should be some effects of L1 transfer in the pronunciation of English loanwords among Thai learners of English. The transfer can yield either positive or negative effect depending on the extent to which the assigned tone and stress in Thai correspond to the English stress pattern of a certain word.

Motivated by the findings from the above-mentioned research works, this

study seeks to investigate the students' ability to locate the primary stress on English loanwords in two types of speech: (1) oral-reading of English sentences each of which contains one target loanword, and (2) oral-reading of the loanwords in isolation. It also aims at exploring the relationship between the students' actual pronunciation of the target loanwords and their competence or underlying knowledge of the stress patterns of those words measured in the form of stress marking on a written test. Based on the findings, the ultimate goal of the study is to examine the extent to which tone assignment and stress patterns in Thai affect the stress placement on English polysyllabic loanwords in the speech of Thai students, as perceived by a native English listener. In light of these objectives, the data collected from the participants will be presented both quantitatively and qualitatively.

CHAPTER III

RESEARCH METHODOLOGY

This chapter introduces the research design and methodology. It consists of four sections as follows:

(1) Participants

(2) Research Instruments

(3) Data Collection

(4) Data Analysis

3.1 Participants

The participants consisted of 30 students drawn from a pool of 82 third-year students in the English-Major program at Dhurakij Pundit University (DPU), which is a private Thai university located in Bangkok, Thailand. The justification for choosing third-year students was that these students already took a course in English pronunciation in the second semester of the previous academic year. This would serve the objective of the study, which was to test the effect of stress patterns and tones in Thai on English loanwords with participants' who had prior basic knowledge of English phonetics.

The selection process was based on the students' relative English proficiency. Scores on an in-house test of English proficiency, referred to as DPU-TEP, were used as the main criterion. The decision to use the in-house proficiency test was due to the fact that it was the most convenient method and that viable alternatives to other

resources were not available. However, the students' GPAs of English courses were also used to support the DPU-TEP results. In the classification process, the DPU-TEP scores obtained by the 82 third-year students were ranked from the highest to the lowest. Then the GPAs of all English courses enrolled in the first and second years of their study were calculated and placed on the list. Fifteen students with the highest DPU-TEP scores and whose GPAs were above 3.00, and 15 students with the lowest DPU-TEP scores and whose GPAs were below 2.50, were selected to participate in the study, and were classified as the *high* group and *low* group, respectively. The 15 students in the high group had the DPU-TEP scores ranging from 52.50 to 68.83 out of the total score of 100 and their GPAs ranged from 3.02 to 3.68. DPU-TEP scores of the 15 low-group students ranged from 23.33 to 38.33, and their GPAs ranged from 1.60 to 2.50. Students in the high group consisted of 3 males and 12 females; the low group comprised 2 males and 13 females. These students had the minimum of 9 years up to the maximum of 14 years of formal English instruction. (Please refer to Appendix A.)

All participants were asked to engage in the study, but were not informed of the specific objectives of the study prior to the experiment.

3.2 Research Instruments

The present study utilized the following instruments for data collection:

(1) An oral-reading test

(2) A written test

The oral-reading test consisted of two parts, Part A and Part B. Part A contained thirty English sentences, each of which had one target English polysyllabic

loanword. The task required the participants to read these sentences at normal speech rate with no knowledge of what elements to be investigated. For this study, this part is considered the least formal type of oral-reading. Part B contained the thirty target English loanwords listed in isolation. Reading words from a list is regarded as a more formal style of reading, for the reader tends to be aware that these words are the target words and thus they have to read them carefully in terms of the segmental sounds and the supra-segmental features.

The written test required the students to mark the primary stress (ˈ) on each of the thirty target loanwords as listed in Part B of the oral-reading test. The stress marking test requires the students to use their cognitive ability consciously to generalize or retrieve rules and guidelines from their learning experiences for locating stress on the right syllable. The test was used to measure the students' competence or underlying knowledge of the English stress patterns of the target English loanwords.

3.2.1 Development of the Research Instruments

3.2.1.1 Selection of English Loanwords

Criteria of Selection

The selection for the target loanwords was based on three main criteria.

(1) Since the purpose of the study was to investigate lexical stress on English loanwords, it was decided that the loanwords to be tested consisted of two syllables, three syllables and four syllables, with 10 words for each category.

(2) They are English loanwords commonly used in the spoken and written Thai language.

(3) In order to test the hypothesis that the stress patterns in Thai, which always falls on the last syllable, affects the stress patterns in English, the loanwords to be tested are those that do not have the primary stress on the last syllable.

Process of Selection

The thirty target loanwords were selected according to the following process.

(1) Twenty-five loanwords from each category: two syllables, three syllables, and four syllables, totaling 75 words, were chosen from the following websites:

http://www.rta.mi.th/chukiat/story/thai_engl.htm

http://www.english-room.com/borrowed_words.html

http://thairo501.tripod.com/information/ThaiOfEngl.htm

None of the 75 selected words had the primary stress on the last syllable.

(2) A Thai EFL teacher who is an expert in English phonetics was asked to choose 15 frequently-used loanwords from each category, totaling 45 words.

(3) Each of these 45 words was checked against the Thai National Corpus (TNC), developed by Chulalongkorn University's Department of Linguistics, to obtain the frequency of use in the spoken and written Thai language.

(4) Then, 10 frequently-used words from each category were selected. These words have the following English stress patterns, where 'O' represents a stressed syllable, and 'o' an unstressed syllable:

Two-Syllable Words:	O o	=	10 words			
Three-Syllable Words:	O o o	=	5 words	o O o	=	5 words
Four-Syllable words:	O o o o	=	3 words	o O o o	=	3 words
	o o O o	=	4 words			

Selected Loanwords

Tables 3.1, 3.2 and 3.3 below illustrate the two-syllable, three-syllable, and four-syllable loanwords, selected for the purpose of this study. Each loanword is marked with the primary stress symbol (ˈ). The Thai orthography and phonemic transcription for the Thai pronunciation is provided. Lexical tones are marked on the transcription according to the rules of tone assignment described in Chapter 2. The frequencies of use, as reported in the Thai National Corpus (TNC) of written Thai language, are displayed in the last column. It should be noted that, in the Thai pronunciation of these loanwords, the primary stress is always on the last syllable, irrespective of the number of syllables within a word.

Table 3.1: *List of Two-Syllable English Loanwords and Frequency of Use*

Two-syllable words				
English	Stress Patterns	Thai	Phonemic Transcription	Frequency of Use
ˈfashion	O o	แฟชั่น	fɛɛ c^{h}ân	2020
ˈdollar	O o	ดอลลาร์	dɔn lâa	1830
ˈtaxi	O o	แท็กซี่	t^{h}ɛ́ k sîi	884
ˈtennis	O o	เทนนิส	t^{h}en nít	881
ˈvirus	O o	ไวรัส	waj rát	539
ˈoffice	O o	ออฟฟิศ	ʔɔ́p fít	392
ˈlaser	O o	เลเซอร์	lee sə̂ə	382
ˈquota	O o	โควตา	k^{h}woo tâa	213
ˈbonus	O o	โบนัส	boo nát	175
ˈsandwich	O o	แซนด์วิช	sɛɛn wít	166

Table 3.2: *List of Three-Syllable English Loanwords and Frequency of Use*

Three-syllable words				
English	Stress Patterns	Thai	Phonemic Transcription	Frequency of Use
ˈalcohol	O o o	แอลกอฮอล์	ʔɛɛn kɔɔ hɔɔ	528
ˈfurniture	O o o	เฟอร์นิเจอร์	fəə ni cə̂ə	496
ˈbattery	O o o	แบตเตอรี	bɛt tə rîi	222
ˈcalorie	O o o	แคลอรี่	kʰɛɛ lɔ rîi	219
ˈmicrowave	O o o	ไมโครเวฟ	maj kʰroo wéep	135
comˈputer	o O o	คอมพิวเตอร์	kʰɔm piw tə̂ə	2719
peˈtroleum	o O o	ปิโตรเลียม	pi tro lîam	716
roˈmantic	o O o	โรแมนติก	roo mɛn tìk	584
bacˈteria	o O o	แบคทีเรีย	bɛ̀k ti ria	393
corˈruption	o O o	คอรัปชัน	kʰɔɔ ráp cʰân	225

Table 3.3: *List of Four-Syllable English Loanwords and Frequency of Use*

Four-syllable words				
English	Stress Patterns	Thai	Phonemic Transcription	Frequency of Use
ˈmissionary	O o o o	มิชชันนารี	mít cʰan na rîi	303
ˈhelicopter	O o o o	เฮลิคอปเตอร์	hee li kʰɔ́p tə̂ə	148
ˈsupermarket	O o o o	ซูเปอร์มาร์เก็ต	súu pə̂ə maa kèt	131
techˈnology	o O o o	เทคโนโลยี	tʰék noo loo jîi	5249
therˈmometer	o O o o	เทอร์โมมิเตอร์	tʰəə moo mi tə̂ə	133
choˈlesterol	o O o o	คอเลสเตอรอล	kʰɔɔ rét təə rɔ̂n	61
elecˈtronics	o o O o	อิเล็กทรอนิกส์	i ɪ́ék tʰrɔ nìk	1235
aluˈminium	o o O o	อะลูมิเนียม	a luu mi nîam	132
carboˈhydrate	o o O o	คาร์โบไฮเดรต	kʰaa boo hai drèet	122
condoˈminium	o o O o	คอนโดมิเนียม	kʰɔn doo mi nîam	119

3.2.1.2 Formation of Sentences

Following the target word selection, a sentence was formulated for each word. Each sentence contains the number of words ranging from 6 to 10. These sentences were written in simple structures in order for the third-year students of both English

proficiency groups to read without difficulty. The 30 sentences were distributed randomly so that the target words could not be easily recognized by the participants.

3.2.1.3 Validity and Reliability Checked

To obtain validity and reliability, these sentences were edited by a native English-speaking teacher (NEST) to ensure correctness. Adjustments were then made based on the NEST's comments and suggestions.

The following are sentences used in Part A of the oral-reading task.

Reading Part A

Please read the following sentences.

1. There is a small supermarket near my house.
2. The company paid him a big bonus.
3. Chlorine is widely used to kill bacteria.
4. A helicopter crashed into a building last night.
5. Jack gives me a ride to the office every morning.
6. A condominium near a BTS station is very expensive.
7. Perfumes and cleaning fluids contain alcohol.
8. Jane connected the microphone to a computer.
9. Too much cholesterol in the blood can cause heart disease.
10. Japan has decreased the import quota on shrimps.
11. His house is full of antique furniture.
12. He printed documents from a laser printer.
13. Most plastic is made from petroleum.
14. Anna started playing tennis last year.

15. To control weight, avoid high calorie foods.
16. Korean fashion is very popular in Thailand.
17. Microwave ovens are not suitable for grilling.
18. These pots and pans are made from aluminium.
19. A thermometer is a tool to measure temperature.
20. Yaya likes to watch romantic movies.
21. One of my school teachers was a missionary.
22. The bird flu virus can pass from human to human.
23. Korea is famous for the electronics industry.
24. The director is facing many charges of corruption.
25. Low carbohydrate diets help people lose weight quickly.
26. My mother made me a tuna sandwich for lunch.
27. I need a battery for my new camera.
28. Modern technology can help reduce production costs.
29. Mary decided to take a taxi to the airport.
30. She handed a ten dollar bill to the cashier.

Part B of the reading test required the participants to read orally the 30 target loanwords, distributed randomly in isolation on a list. Reading words from a list is regarded as a more formal style of reading, for the students tend to become aware of the target words to be tested. Consequently, it was expected that their performance in the oral-reading of loanwords in Part A and Part B should be different. The list of loanwords in Part B is shown below:

Reading Part B

Please read the words on the list below.

1.	thermometer	11.	quota	21.	helicopter
2.	sandwich	12.	condominium	22.	bonus
3.	furniture	13.	petroleum	23.	corruption
4.	carbohydrate	14.	dollar	24.	cholesterol
5.	office	15.	technology	25.	taxi
6.	calorie	16.	computer	26.	electronics
7.	aluminium	17.	romantic	27.	alcohol
8.	tennis	18.	supermarket	28.	microwave
9.	bacteria	19.	fashion	29.	virus
10.	laser	20.	missionary	30.	battery

Written Test

The written test required the students to mark the primary stress on each of the thirty target loanwords on the same list as in Reading Part B. It was assumed that in the stress marking task, the students had to utilize their competence or underlying knowledge of rules and guidelines for locating stress from their learning experience and spell it out by putting a mark on each word. The written test is shown below.

Please put the stress mark (ˈ) on the correct syllable.

1.	thermometer	11.	quota	21.	helicopter
2.	sandwich	12.	condominium	22.	bonus
3.	furniture	13.	petroleum	23.	corruption
4.	carbohydrate	14.	dollar	24.	cholesterol

5.	office	15.	technology	25.	taxi
6.	calorie	16.	computer	26.	electronics
7.	aluminium	17.	romantic	27.	alcohol
8.	tennis	18.	supermarket	28.	microwave
9.	bacteria	19.	fashion	29.	virus
10.	laser	20.	missionary	30.	battery

3.2.2 Instrument Test-Run

Prior to the actual administration of the test, the instrument was test-run with the participation of two students, one with relatively higher English ability and the other with lower English ability. The two participants were given Part A and Part B of the reading test separately and were asked to read each part out loud. Their speech was recorded using the Sound Forge 9 software. Following the oral-reading tasks, the participants were asked to mark the primary stress on each of the target words. The purpose of the test-run was to anticipate potential problems that may arise in the actual administration of the test and to approximate the time needed to complete the three tasks. It was found that both participants had no difficulty performing the tasks, and the average time they used to complete the process was 30 minutes.

3.3 Data Collection

The data collection was conducted in a language laboratory with all the 30 participants present simultaneously at one time so that no participant had a chance to know about the test or the words on the test before actually performing the three tasks. The data collection process was conducted according to the following stages.

(1) Prior to the distribution of the test, the participants were informed of the overall process to complete the three tasks. They were also instructed of the method to record their speech using the Sound Forge 9 Software. To ensure that the participants understood the recording process, they were asked to record one or two short sentences, save the file, and listen to their own recording to check the appropriate level of loudness and clarity of their speech on the recorded file.

(2) After the task introduction, the participants were given Part A of the oral-reading test. Before recording their speech, the participants were instructed to read the thirty sentences silently for a few minutes to familiarize themselves with the words in the sentences, but not to ask any questions about the pronunciation of words, nor to use a dictionary of any type. The reason for this was to ensure that the test results would reflect the participants' actual awareness of the English stress patterns of the target loanwords from their basic knowledge of English phonetics, and examine the effect of stress and tones in Thai on the resultant stress patterns of these words.

(3) After the familiarization period, the participants individually recorded their oral-reading of the 30 sentences at their normal speech rate, and saved their files as Task R1.

(4) Following the first task, the participants were given a list of the 30 target loanwords to read out loud and record their speech on a separate file, which was saved as Task R2.

(5) After completing Part A and Part B of the oral-reading tasks, the participants were asked to mark the symbol (') in front of the syllable that carries the primary stress for each English loanword on the written test (Task W1).

3.4 Data Analysis

The focus of the present study aims at investigating the effect of tones and stress in Thai on the resultant stress patterns of English loanwords as perceived by a native English speaker. The analysis of the data was conducted in four stages:

(1) A native English speaking teacher (NEST) was asked to listen to Task R1 and Task R2 from each recording and mark stress on the target loanwords which corresponded to the student's pronunciation. To attain the reliability in the identification of stress, 3 out of 15 recordings were randomly selected from each group as representative samples. These randomly selected samples, representing 20% of the students in each group, were listened to by the NEST and another native speaker of English. The percentage of agreement of the primary stress identification between the two raters was 99.5% for the high group and 99.0% for the low group. The Kappa coefficient of the randomly selected samples was calculated and the values attained were .992 and .985 for the high and low groups respectively. This was considered as a sufficient degree of agreement between the two raters for the present study.

(2) In the second stage, the students' word stress patterns transcribed from the audio recording were checked, and categorized.

(3) In the third stage, the students' stress-marking written test-task (Task W1) was checked by the researcher and compared against the students' oral-reading performance in Task R1 and Task R2.

(4) In the final stage, the data was compiled and analyzed using descriptive statistics, Independent Samples t-test, and Pearson product-moment correlation coefficient.

CHAPTER IV

RESULTS AND DISCUSSION (1)

The results of the analyses in this study are both quantitative and qualitative in nature. The aim of the quantitative analyses is to investigate the stress placement of English polysyllabic loanwords among Thai students with two different levels of English proficiency and to examine relationships between the students' competence in locating stress on English polysyllabic loanwords in the written test and their performance in actually pronouncing these words when they read them out loud in English sentences and in isolation. The qualitative analyses aim at testing the hypothesis that the stress patterns of English polysyllabic loanwords pronounced by Thai students are largely affected by L1 transfer which results from the positive and negative effects of the Thai stress system and tone assignment.

The main goal of the present chapter is thus to seek answers to the first two research questions addressed in the study:

(1) Depending on levels of English proficiency, are there any differences in the students' ability to locate the primary stress correctly in two types of speech: reading the target loanwords in English sentences, and reading these loanwords in isolation, as opposed to the stress marking task?

(2) Are there relationships between the students' competence in locating stress on English polysyllabic loanwords and their performance in actually pronouncing these words in the oral-reading tasks?

The organization of this chapter is as follows. First, the results of the students' stress patterns of loanwords in the three types of tasks between the high and low groups will be presented. Second, the students' performance in Task R1, reading loanwords in English sentences, will be explored in greater depth by examining stress placement for each category of loanwords: two-syllable loanwords, three-syllable loanwords and four-syllable loanwords. Then, by using the same statistical analyses, the students' stress placement in Task R2, reading loanwords in isolation, will be reported, followed by the performance on Task W1, word stress marking on the written test. Finally, the students' performance on the two oral-reading tasks, R1 and R2, will be compared with that on the stress marking task, W1, to demonstrate the relationship between the students' competence in the stress patterns of English polysyllabic loanwords and their performance in actually pronouncing these words.

In the next chapter, the effect of stress patterns and tones in Thai on the resultant stress patterns of those polysyllable loanwords among the Thai students will be presented and discussed qualitatively.

4.1 Students' Stress Placement of English Loanwords in Three Tasks

Table 4.1: *Students' Correct Use of Stress in Three Tasks*

Group	Sentence Reading			Word Reading			Stress Marking		
	R1 (30 words)			R2 (30 words)			W1 (30 words)		
	F	%	$\bar{x}$	F	%	$\bar{x}$	F	%	$\bar{x}$
High (n=15)	263/450	58.4	17.53	349/450	77.6	23.27	376/450	83.6	25.07
Low (n=15)	217/450	48.2	14.47	313/450	69.6	20.87	331/450	73.6	22.07
TOTAL (n=30)	480/900	53.4	16.00	662/900	73.6	22.07	707/900	78.6	23.57

To present an overview of the students' performance in 3 task types: reading English sentences (R1), reading loanwords in isolation (R2), and marking stress in writing (W1), Table 4.1 displays the students' use of correct stress in frequency, percentage and mean value. The figures in the first and second rows represent the numbers of correct stress placement on the 30 target loanwords of students in the high group and low group, respectively, taken from a total frequency count (F) of 450 for each task type, calculated into percentages (%), and mean values ($\bar{x}$). The last row displays the sum of correct stress performed by students in both groups, taken from a total frequency count (F) of 900.

The results show that the students marked stress correctly in the written task (W1) at the highest percentages, 83.6% for the high group and 73.6% for the low group, with the average percentage of 78.6%. Both groups of students could least correctly pronounce loanwords in sentences (R1), 58.4% and 48.2% for the high group and the low group, respectively. One possible reason could be that the stress-marking task, as opposed to the oral-reading task, allows more time for the students to employ their cognitive ability in generalizing or retrieving rules and guidelines for English stress patterns from their learning experiences. In addition, it may be assumed that there could be a mismatch between competence and performance with regard to stress in English loanwords. The students may have a problem of using the correct pitch levels for stressed and unstressed syllables despite the fact that they know where the stress position is. This could be caused by L1 interference. On the one hand, there is a carry-over of the tonal categories and the stress system in Thai onto English loanwords, while, on the other hand, the students also lack sufficient practice in pronouncing the words with correct stress placement.

Based on the author's observations when teaching English pronunciation, many students have difficulty using the correct pitch for stressed and unstressed syllables even when the words have already been marked with the stress symbol. Due to the fact that the suprasegmental systems between L1 and L2 are different, without continual and adequate practice, mastery of the L2 system is hard to achieve. This explains why students in this study, regardless of proficiency levels, demonstrated a higher ability to locate stress correctly in stress-marking than in the two oral-reading tasks. The finding implies that the students had relatively high competence of English stress patterns, but they did not perform satisfactorily when actually reading the words.

Table 4.2: *Comparison of the Mean Values for Correct Stress in Three Tasks*

Group Comparison	R1		R2		W1	
	High	Low	High	Low	High	Low
Mean	17.53	14.47	23.27	20.87	25.07	22.07
Mean Diff.	3.06		2.40		3.00	
t	1.705		2.997		2.462	
Sig.	.099		.006*		.020*	

*p < .05

In order to see the differences in the test performance of the two groups, the mean values of the correct use of stress among the three task types were compared. Statistical results from the Independent Samples t-test show significant differences in the ability to use correct stress between the two groups in Task R2 and Task W1 at the alpha .05 level. The difference in using correct stress in reading loanwords in sentences (R1) between the high and low groups was not statistically significant, as shown in Table 4.2. This result suggests that students with high and low English proficiency had significantly different levels of competence in English stress patterns, as evidenced in the stress marking task and in careful speech, but when they read the

words in English sentences in Task R1, the two groups did not demonstrate a significant difference in their performance.

In examining in greater depth into the use of stress for each task according to the loanword categories: two-syllable loanwords, three-syllable loanwords and four-syllable loanwords, the data were calculated. The results are presented and discussed in the sections that follow.

4.2 Students' Stress Placement of Reading English Loanwords in Sentences (R1)

Table 4.3 below shows the students' performance in reading loanwords with two syllables, three syllables, and four syllables in English sentences (Task R1). The data in the first and second rows represent the numbers of correct stress placement on the 10 loanwords in each category of the students in the high group and low group, respectively, taken from a total frequency count (F) of 150, then calculated into percentages (%), and mean values ($\bar{x}$). The last row shows the sum of correct stress performed by students in both groups, taken from a total frequency count (F) of 300.

Table 4.3: *Students' Correct Use of Stress in Reading Loanwords in Sentences (R1)*

Group	2-syllable words (10 words)			3-syllable words (10 words)			4-syllable words (10 words)		
	F	%	$\bar{x}$	F	%	$\bar{x}$	F	%	$\bar{x}$
High (n=15)	95/150	63.3	6.33	99/150	66.0	6.60	69/150	46.0	4.60
Low (n=15)	68/150	45.3	4.53	91/150	60.7	6.13	58/150	38.7	3.87
TOTAL (n=30)	163/300	54.3	5.43	190/300	63.3	6.37	127/300	42.3	4.23

Obviously, the correct stress placement of lower than 50% in reading four-syllable loanwords of the students in both groups suggests that this loanword category is the most difficult to pronounce correctly. This result supports the findings in

Watanapokakul's (2009) study reporting that the more syllables a word has, the more difficult it is for the students to pronounce in terms of correct stress placement. However, it is interesting to note that students in both groups placed the primary stress correctly in a greater number on three-syllable words than on two-syllable words. This result does not accord with Watanapokakul's (2009) findings.

Among the three categories of loanwords, the gap in the percentages of correct stress between two-syllable words and three-syllable words in the high group, i.e. 63.3% and 66%, was relatively close compared with the gap between three-syllable words and four-syllable words, i.e. 66% and 46%, suggesting that four-syllable loanwords are substantially more difficult to pronounce than the other two categories. Comparatively, the percentages of the correct use of stress performed by the low group on two-syllable words and three-syllable words were relatively distant, i.e. 45.3% and 60.7%. One can observe a more sizable gap in the low-group's use of correct stress between three-syllable words and four-syllable words, 60.7% and 38.7%, confirming that four-syllable loanwords are challenging for the students to pronounce correctly.

In order to see the differences in the performance on loanwords in each category between the two sample groups, mean values of the correct use of stress were compared, as shown in Table 4.4.

Table 4.4: *Comparison of the Mean Values for Correct Stress in Reading Sentences*

Group Comparison	2-syllable words		3-syllable words		4-syllable words	
	High	Low	High	Low	High	Low
Mean	6.33	4.53	6.60	6.13	4.60	3.87
Mean Diff.	1.80		0.47		0.73	
t	1.795		.647		1.403	
Sig.	.083		.523		.171	

Results from the Independent Samples t-test show that the differences in the ability to read loanwords with two syllables, three syllables, and four syllables between the two groups in task R1 were not statistically significant. The results suggest that, when reading English sentences, stress is sometimes ignored by students regardless of their English proficiency. Particularly when loanwords are concerned, the students are inclined to be affected by L1 transfer and pronounce these words using the Thai tonal categories and stress patterns.

As earlier mentioned, when the students were asked to participate in this research work, they were not informed of the specific objective of the study. The students were merely instructed to read the English sentences naturally at normal speaking rate. Consequently, they performed Task R1 with no knowledge of what language element was being investigated. It was anticipated that they would read words in those sentences without paying full attention to correct English stress patterns. In addition, the students' familiarity with the Thai pronunciation of English loanwords that are used frequently in the Thai context possibly caused the students' pronunciation of these loanwords to be affected to a great extent by L1 transfer. However, when the students were given the list of the target loanwords to read out loud in Task R2, it was hypothesized that they would read these words more carefully. Reading words in isolation is regarded as a more formal style of reading, for the students tend to be aware that these words are the language element being investigated, and thus they have to read them carefully in terms of clear articulation and correct stress position.

In order to examine the students' stress placement when reading English loanwords in isolation, the performance of Task R2 by both groups of students will be presented in the following section.

4.3 Students' Stress Placement of Reading English Loanwords in Isolation (R2)

Table 4.5: *Students' Correct Use of Stress in Reading Loanwords in Isolation (R2)*

Group	2-syllable words (10 words)			3-syllable words (10 words)			4-syllable words (10 words)		
	F	%	x̄	F	%	x̄	F	%	x̄
High (n=15)	145/150	96.7	9.67	119/150	79.3	7.93	85/150	56.7	5.67
Low (n=15)	128/150	85.3	8.53	111/150	74.0	7.40	74/150	49.3	4.93
TOTAL (n=30)	273/300	91.0	9.10	230/300	76.7	7.67	159/300	53.0	5.30

Table 4.5 shows the students' performance in pronouncing the two-syllable, three-syllable, and four-syllable loanwords in isolation (Task R2). Comparatively, the students had substantially higher degrees of correct stress placement for reading loanwords on the list in Task R2 than reading them in sentences in Task R1. In reading loanwords in isolation, the students in both groups had the highest degree of accuracy in placing stress on two-syllable loanwords, i.e. 96.7 and 85.3% for the high group and the low group, respectively. The degrees of accuracy were also high for three-syllable words, 79.3% for the high group and 74.0% for the low group. However, as discussed in earlier sections that students had substantial difficulty with stress on four-syllable loanwords, one may observe that the performance of both groups dropped remarkably on this loanword category, i.e. 56.7% in the high group and only 49.3% in the low group.

A notable point observed in Task R2, as opposed to Task R1, is that in reading loanwords in English sentences, i.e. Task R1, which is regarded as a less formal type

of oral-reading, the students made more stress mistakes on loanwords with two syllables than loanwords with three syllables. However, when reading the target loanwords in isolation in R2, the students made more mistakes on three-syllable words than two-syllable words, and they made the highest degree of stress misplacement on four-syllable loanwords. It can be seen that only the results of Task R2, but not those of Task R1, accord with Watanapokakul's (2009) findings, the more syllables a word has, the higher potential the students make mistakes in pronouncing the word with correct stress placement.

A question may arise as to why the students made more mistakes in two-syllable words than three-syllable words when reading these words in sentences. The reason for this is rather unclear, but one possible explanation could be that, in a less formal style of reading, the students were likely to pronounce words without full attention to English stress patterns. It may be hypothesized that, in a less careful speech, the impact of the Thai pronunciation could be greater on loanwords with two syllables than three syllables. This is probably because familiarity with the Thai pronunciation of loanwords plays a more crucial role in pronouncing frequently-used loanwords that contain a small number of syllables. As the number of syllable increases in a word, the students tend to become more aware of using the correct stress patterns even when reading it in a sentence. This probably explains why students made fewer mistakes when pronouncing loanwords with three syllables than those with two syllables in Task R1. However, because four-syllable loanwords are always problematic, the students could least pronounce these words correctly, irrespective of the task types.

To examine differences in the ability to pronounce loanwords between the two groups in Task R2, mean values of the correct use of stress were compared, as shown in Table 4.6.

Table 4.6: *Comparison of the Mean Values for Correct Stress in Reading Words (R2)*

Group Comparison	2-syllable words		3-syllable words		4-syllable words	
	High	Low	High	Low	High	Low
Mean	9.67	8.53	7.93	7.40	5.67	4.93
Mean Diff.	1.14		0.53		0.74	
t	2.345		1.133		1.530	
Sig.	.031*		.267		.137	

*p < .05

Statistical results from the Independent Samples t-test show that the difference in the mean values was significant in the pronunciation of loanwords with two syllables, but not those with three syllables and four syllables. The results suggest that even though students pay greater attention when reading the target words more carefully, one can see that words containing a high number of syllables are still challenging to the students, irrespective of their proficiency levels.

4.4 Students' Responses from Stress Marking of English Loanwords (W1)

Table 4.7: *Students' Correct Stress Marking of English Loanwords in Task W1*

Group	2-syllable words (10 words)			3-syllable words (10 words)			4-syllable words (10 words)		
	F	%	$\bar{x}$	F	%	$\bar{x}$	F	%	$\bar{x}$
High (n=15)	145/150	96.7	9.67	135/150	90.0	9.00	96/150	64.0	6.40
Low (n=15)	133/150	88.7	8.87	116/150	77.3	7.73	82/150	54.7	5.47
TOTAL (n=30)	278/300	92.7	9.27	251/300	83.7	8.37	178/300	59.3	5.93

Table 4.7 demonstrates results of the students' correct stress marking on loanwords in the written test task, W1. The results show clearly that the students in both groups marked the primary stress more correctly in all categories of loanwords than when they pronounced them in the two oral-reading tasks. One cannot deny the fact that the written test, as opposed to the oral-reading task, allows more time for the students to use their mental skills in retrieving or generalizing rules of English stress from their learning experiences. As a result, in performing this task, even the low-group students could correctly mark stress on four-syllable words at higher than 50% accuracy. The percentages soared up to 77.3% and 88.7% for three-syllable words and two-syllable words, respectively. The high-group students marked stress correctly for two-syllable words at 96.7% and three-syllable words at 90.0%. For four-syllable words, however, the percentage dropped substantially to 64.0%, confirming results earlier presented that four-syllable words are challenging for students, even those with relatively higher English proficiency, to place stress correctly.

To examine the differences in the students' knowledge of the English stress patterns of loanwords across the two groups, the mean values of correct stress marked by both groups were compared, as shown in Table 4.8.

Table 4.8: *Comparison of the Mean Values for Marking Correct Stress (W1)*

Group Comparison	2-syllable words		3-syllable words		4-syllable words	
	High	Low	High	Low	High	Low
Mean	9.67	8.87	9.00	7.73	6.40	5.47
Mean Diff.	0.80		1.27		0.93	
t	1.855		2.120		1.270	
Sig.	.078		.045*		.214	

*p < .05

The Independent Samples t-test results show that the difference in the performance of the two groups was significant in marking stress on three-syllable loanwords, but not on loanwords with two and four syllables. The findings suggest that stress on two-syllable loanwords is accessible to both groups, causing students with varying proficiency levels to demonstrate no significant difference in placing stress correctly. Stress patterns on four-syllable loanwords, on the contrary, are challenging to most students, resulting in the lowest degree of accuracy in the stress placement among the students in both groups.

In response to Research Question 2, the relationship between the students' competence in using stress patterns of English polysyllabic loanwords and their actual pronunciation of these words was examined. The results are presented and discussed in the following sections.

4.5 Relationships between Pronunciation and Stress Marking of Loanwords

Table 4.9: *Correlations of Students' Correct Use of Stress between Tasks*

	W1	
	r	Sig.
R1	.150	.429
R2	.508	**.004****

**p < .01

To examine whether there was a relationship between the students' actual pronunciation of the English polysyllabic loanwords in the oral-reading tasks, R1 and R2, and their competence of stress patterns, which was measured by the stress marking task, W1, Pearson product-moment correlation coefficient was used to analyze the data. The results presented in Table 4.9 show that the knowledge or ability of the students to mark stress (W1) correlates with their ability to pronounce the

words in isolation (R2). The correlation is significant at the 0.01 level (2-tailed). The results also show that the students' knowledge of stress in W1 does not correlate with their ability to pronounce the target words in English sentences in Task R1. The findings imply that familiarity with the Thai pronunciation of loanwords plays a more crucial role in the pronunciation of these words in a less formal style of reading. The students tend to become more aware of using correct stress in a more formal type of reading, resulting in a closer relationship between the students' competence and their performance in using English stress.

To investigate in greater depth the relationship between the students' knowledge of stress patterns and their pronunciation of English loanwords according to the number of syllables; i.e. two-syllable loanwords, three-syllable loanwords and four-syllable loanwords, the data were further analyzed and presented in the following sections.

4.6 Relationships between Pronunciation and Stress Marking of Two-Syllable Loanwords

Table 4.10: *Correlations of Students' Correct Use of Stress across Three Tasks in Two-Syllable Loanwords*

	W1	
	r	Sig.
R1	.360	.051
R2	.319	.086

In the investigation of relationships between the students' knowledge or competence of word stress and their performance in actually pronouncing loanwords with two syllables, it was found that the relationship between the students' oral-

reading of two-syllable loanwords in sentences (R1) and their knowledge of stress (W1) is at a low level; the correlation is not statistically significant, as display in Table 4.10. Likewise, the statistical results from Pearson product-moment correlation coefficient also show no significant correlation between the students' knowledge of stress patterns and their ability to pronounce the two-syllable loanwords in isolation (R2). The findings suggest that the students' performance in pronouncing loanwords with two syllables did not accord with their competence in the English stress patterns of these words. One possible explanation for this situation could be that the students may not have paid sufficient attention to the English stress patterns of words with two syllables, particularly when these loanwords are mixed up with some other words in various sentences. This possibly caused the students to pronounce these loanwords in the Thai way. The L1 transfer effect appeared to be greater in pronouncing loanwords that contain a small number of syllables and that are frequently used in the Thai context.

4.7 Relationships between Pronunciation and Stress Marking of Three-Syllable Loanwords

Table 4.11: *Correlations of Students' Correct Use of Stress across Three Tasks in Three-Syllable Loanwords*

	W1	
	r	Sig.
R1	.142	.454
R2	.564	**.001****

**p < .01

For loanwords with three syllables, the results presented in Table 4.11 show that there was a relationship between W1 (stress marking) and R2 (reading words in

isolation). The correlation is significant at the 0.01 level (2-tailed). The result for R1 and W1, on the contrary, shows that the correlation between the students' reading three-syllable loanwords in sentences (R1) and their knowledge of stress patterns is not statistically significant. The findings suggest that a relationship exists between the students' competence in English stress patterns and their performance when they read the words more carefully. This result implies that students tended to be conscious of stress patterns for three-syllable words, particularly when the words are listed individually. They placed stress more correctly on three-syllable words although these words are likely to be more difficult to pronounce correctly than two-syllable words. As one can see, the students made more mistakes for two-syllable loanwords, which are generally accepted to be less difficult to locate stress correctly than words with a higher number of syllables. It could be hypothesized that the students may have disregarded the importance of stress patterns for two-syllable words and they were more familiar with the Thai pronunciation of these words. Comparing the results of three-syllable loanwords with two-syllable loanwords, one can observe that the students demonstrated a lower degree of L1 transfer when they read three-syllable loanwords in isolation than when they read two-syllable loanwords.

4.8 Relationships between Pronunciation and Stress Marking of Four-Syllable Loanwords

Table 4.12: *Correlations of Students' Correct Use of Stress across Three Tasks in Four-Syllable Loanwords*

	W1	
	r	Sig.
R1	.262	.162
R2	.096	.614

It is clear from earlier results presented in this study that four-syllable loanwords are challenging to locate stress correctly, even for learners with relatively higher English proficiency. Thus, one can observe from the statistical results displayed in Table 4.12 that the correlation between the students' knowledge of stress patterns (W1) and their ability to pronounce the four-syllable loanwords in both R1 and R2 was at a low level. The correlation is not statistically significant as shown. The findings suggest that the students' performance in pronouncing loanwords with four syllables did not accord with their competence in the English stress patterns of these words. It seems likely that the primary stress was placed randomly due to the students' insufficient knowledge of stress placement on words with a high number of syllables.

4.9 Summary

This chapter reports results of the quantitative analyses of the ability to locate the primary stress in English polysyllabic loanwords of Thai students with two English proficiency levels. Three task types were used as instruments for data collection: (1) reading sentences with the target loanwords; (2) reading the loanwords in isolation; and (3) marking stress on each of the loanwords. Based on these results, the second objective was to examine relationships between the students' competence in the stress patterns and their performance in actually pronouncing these loanwords.

In light of the first objective of this study, the analyses reveal that among the three different tasks, students in both groups performed best in the stress marking task, W1, followed by reading words in isolation, R2. Students could least pronounce loanwords in sentences, R1, with correct stress placement. As Task W1 did not

require spontaneous responses in the same way that Task R1 did, it could be hypothesized that the students had more time to utilize their mental skills by retrieving rules of English stress patterns to locate stress more correctly on the list of the target words. Similarly, when performing Task R2, as opposed to Task R1, the students had full knowledge of the words being investigated; thus, they were more conscious of correct pronunciation when pronouncing the given words than when they read them mixed up in sentences in the earlier task. In comparing the ability to use correct stress between the high and low groups, statistical results from the Independent Samples test show a significant difference in Tasks R2 and W1, suggesting that students with relatively higher English proficiency have higher competence and are more able to use correct stress in tasks that require greater conscious attention to English stress patterns.

When examining in greater depth the use of stress in loanwords classified according to the number of syllables, it was found that in Task R1, students in both groups read words with three syllables more correctly than words with two syllables. Four-syllable loanwords posed the greatest difficulty for students of both groups. These results did not totally support Watanapokakul's (2009) findings reporting that the higher number of syllables a word has, the more difficult it is for the students to pronounce. Statistical testing results show no significant difference in the performance of the high and low groups in any of the three categories of loanwords, suggesting that when reading English sentences without careful attention to stress patterns on loanwords, students, irrespective of English proficiency levels, tend use stress incorrectly as they may resort to the pronunciation in their L1.

For loanword reading in Task R2, the students became more aware that they had to read individual words more carefully. This time, the results show a linear decrease of correct stress placement as the number of syllable increases. Such results accords with Watanapokakul's (2009) findings, the more syllables a word has, the higher potential the students use stress incorrectly. The t-test results show a significant difference in the ability to read loanwords with two-syllables, but not those with three and four syllables. This suggests that loanwords with higher numbers of syllables are difficult to pronounce by students in both groups even when they pay greater attention in pronouncing those words.

In the stress marking task, which was used to measure the students' knowledge of English stress patterns, the results clearly show that students in both groups had the highest degree of correct stress placement in all categories of loanwords. Like Task R2, the degree of accuracy in correct stress marking decreased as the number of syllable increases. Statistical testing results show a significant difference in the competence of stress patterns on three-syllable loanwords between the two sample groups. The findings indicate that both groups had substantial difficulty with loanwords with four syllables, but less difficulty with stress on loanwords with two syllables.

The second objective of the study was to examine relationships between the students' competence of stress patterns of the target loanwords as measured by Task W1 and their actual pronunciation of those words. The results show that there was a significant correlation between the students' competence of stress patterns and their performance in pronouncing the loanwords in isolation at the 0.01 level. The findings suggest that when the students read words carefully, a relationship exists between

competence and performance of the students, which implies that the effect of the Thai pronunciation of frequently-used loanwords tends to play a more crucial role when these words are pronounced in a less formal style of oral-reading.

In further examining the relationships between knowledge of stress and actual pronunciation according to each category of loanwords, the results from Pearson correlation reveal no significant correlation between the students' competence of stress patterns and their ability to pronounce two-syllable loanwords in both oral-reading tasks, R1 and R2. One possible reason could be that the students did not pay sufficient attention to the stress patterns of loanwords with two syllables, causing them to perform inconsistently in different types of tasks. For three-syllable loanwords, the results show a significant correlation between W1 and R2, but not between W1 and R1. The results suggest that the performance in reading three-syllable loanwords accords with the competence of the students only when the students carefully read those words in isolation. As for loanwords with four syllables, statistical results show a low level of relationships between the students' competence of stress patterns (W1) and their ability to pronounce the four-syllable loanwords for both R1 and R2 tasks, suggesting that the students possibly located stress randomly when performing each task due to insufficient knowledge of stress patterns in English words with more than three syllables.

To conclude, the findings presented in this chapter imply that in order to increase the levels of competence and performance in using correct stress, both teachers and students should pay more attention to stress patterns in English polysyllabic words, particularly those with a high number of syllables. In addition,

students should always be careful with correct stress placement if an acceptable mastery of spoken English is a learning goal.

So far, the results have been presented based on the quantitative analyses of the students' performance on the three tasks. In order examine the extent to which stress patterns and tones in Thai may have an effect on the resultant stress patterns of English polysyllabic loanwords in the students' pronunciation as perceived by a native English listener, the correct and incorrect use of stress by the students will be presented and discussed qualitatively in the next chapter.

CHAPTER V

RESULTS AND DISCUSSION (2)

The present chapter aims to investigate and analyze qualitatively the extent to which stress and tones in Thai have an effect on the resultant stress placement of English polysyllabic loanwords in the pronunciation of Thai students. The purpose of the analyses in this chapter is to seek and discuss qualitatively answers to the third research question addressed in the study:

To what extent is there an effect of stress patterns and tones in Thai on the resultant stress placement of English polysyllabic loanwords in the pronunciation of Thai EFL students in an English major program as perceived by a native English listener?

The findings are anticipated to test the hypothesis put forward in Chapter 1 that there will be effects of stress patterns and tones in Thai on the resultant stress placement of English loanwords due to positive and negative transfers of L1.

Before examining the students' performance in the sections that follow, a few crucial points with regard to the similarities and differences of English stress patterns and the stress and tonal systems in Thai are worth discussing here.

Firstly, as mentioned earlier in Chapter 2, the stress systems of Thai and English are different. Thai is classified as a fixed-stress language, while English is a free-stress language. As a fixed-stress language, the primary stress always exists on the last syllable of Thai polysyllabic words regardless of the speech types: whether it is fast, normal, or carefully spoken. On the contrary, the position of stress in English

is not fixed in relation to the word, causing the stress placement to be completely unpredictable. The difference in the stress systems of the two languages seems to cause substantial difficulty for Thai learners to place stress correctly in English polysyllabic words.

Secondly, the main characteristic of a stressed syllable in Thai is different from that in English. In Thai, a syllable with strong stress is clearly noticeable by the vowel sound which is longer in duration than when it is in a syllable with weak or reduced stress (Vairojanawong, 1983). A stressed syllable in English, by contrast, is perceived by the rapid change of pitch from a mid or low level to a prominently higher pitch.

Thirdly, as Thai is a tone language, each syllable within a Thai word is assigned a fixed pitch level based on the syllable structure, syllable type and syllable position. Unlike Thai, English has no lexical tones on syllables. Only a stressed syllable in English is perceived as having a prominently higher pitch than the surrounding syllables within a word. As regards such different systems, when English words are borrowed into Thai, these borrowed words will be assigned tonal categories based on both phonetic and non-phonetic factors. There are cases when a high tone is assigned to unstressed syllables of English loanwords, resulting in the syllables being pronounced in a high pitch. When a Thai speaker pronounces an unstressed syllable in a high tone, a native English listener tends to perceive it as a stressed syllable.

Based on the contrasting strategies in the application of stress patterns between English and Thai, the main goal of this chapter is to explore and discuss qualitatively the effects of stress patterns in Thai and tone adaptation of English

polysyllabic loanwords on the resultant stress placement in the speech of Thai speakers, as perceived by a native English listener.

The organization of the present chapter is as follows: first, the students' performance on each of the two-syllable English loanwords will be qualitatively analyzed and discussed. This is followed by the pronunciation of each of the three-syllable loanwords. Finally, the students' performance on the four-syllable loanwords will be presented.

5.1 Students' Stress Placement of Two-Syllable English Loanwords

Table 5.1: *Students' Correct and Incorrect Stress on Two-Syllable Loanwords*

	Word	Transcription & Thai tones	Words in Sentences (R1)		Words in Isolation (R2)		Marking (W1)
			☑ **O o**	☒ o O	☑ **O o**	☒ o O	Correct
High Group (n=15)	ˈsandwich	sɛn wít	3 (20.0%)	12 (80.0%)	13 (86.7%)	2 (13.3%)	15 (100%)
	ˈtennis	tʰen nít	6 (40.0%)	9 (60.0%)	14 (93.3%)	1 (6.7%)	12 (80.0%)
	ˈoffice	ʔɔ́p fít	9 (60.0%)	6 (40.0%)	14 (93.3%)	1 (6.7%)	14 (93.3%)
	ˈvirus	waj rát	10 (66.7%)	5 (33.3%)	15 (100%)	0 (0%)	15 (100%)
	ˈbonus	boo nát	13 (86.7%)	2 (13.3%)	14 (93.3%)	1 (6.7%)	14 (93.3%)
	ˈquota	kʰwoo tâa	8 (53.3%)	7 (46.7%)	15 (100%)	0 (0%)	15 (100%)
	ˈtaxi	tʰɛ́k sîi	10 (66.7%)	5 (33.3%)	15 (100%)	0 (0%)	15 (100%)
	ˈdollar	dɔn lâa	11 (73.3%)	4 (26.7%)	15 (100%)	0 (0%)	15 (100%)
	ˈfashion	fɛɛ cʰân	11 (73.3%)	4 (26.7%)	15 (100%)	0 (0%)	15 (100%)
	ˈlaser	lee sə̂ə	14 (93.3%)	1 (6.7%)	15 (100%)	0 (0%)	15 (100%)
Mean			63.3%	36.7%	96.7%	3.3%	
	Word	Transcription & Thai tones	Words in Sentences (R1)		Words in Isolation (R2)		Marking (W1)
			☑ **O o**	☒ o O	☑ **O o**	☒ o O	Correct
Low Group (n=15)	ˈsandwich	sɛn wít	3 (20.0%)	12 (80.0%)	11 (73.3%)	4 (26.7%)	14 (93.3%)
	ˈtennis	tʰen nít	3 (20.0%)	12 (80.0%)	10 (66.7%)	5 (33.3%)	12 (80.0%)
	ˈoffice	ʔɔ́p fít	7 (46.7%)	8 (53.3%)	11 (73.3%)	4 (26.7%)	13 (86.7%)
	ˈvirus	waj rát	5 (33.3%)	10 (66.7%)	12 (80.0%)	3 (20.0%)	15 (100%)
	ˈbonus	boo nát	8 (53.3%)	7 (46.7%)	9 (60.0%)	6 (40.0%)	10 (66.7%)
	ˈquota	kʰwoo tâa	6 (40.0%)	9 (60.0%)	15 (100%)	0 (0%)	15 (100%)
	ˈtaxi	tʰɛ́k sîi	9 (60.0%)	6 (40.0%)	15 (100%)	0 (0%)	15 (100%)
	ˈdollar	dɔn lâa	5 (33.3%)	10 (66.7%)	15 (100%)	0 (0%)	12 (80.0%)
	ˈfashion	fɛɛ cʰân	10 (66.7%)	5 (33.3%)	15 (100%)	0 (0%)	14 (93.3%)
	ˈlaser	lee sə̂ə	12 (80.0%)	3 (20.0%)	15 (100%)	0 (0%)	13 (86.7%)
Mean			45.3%	54.7%	85.3%	14.7%	

Table 5.1 shows the stress placement of students in the high group and low group on each of the two-syllable loanwords in two oral-reading tasks: reading loanwords in English sentences (R1) and reading loanwords in isolation (R2). As

there are 15 students in each sample group, the value in each column demonstrates the number of students pronouncing each word in the oral-reading tasks across two stress patterns: O o (where the primary is on the first syllable), and o O (where the primary is on the second syllable). For ease of understanding, the tokens were calculated into percentages. English words listed in the left column are marked with the primary stress symbol; transcriptions for the Thai pronunciation are marked with lexical tones in Thai. In the last column of Table 5.1, the students' correct responses of stress marking task (W1) are shown to indicate the students' cognitive awareness of stress placement of a particular word. In order to analyze and discuss the use of stress in the two groups of students in greater depth, the performance of each group will be presented separately in the following sub-sections.

5.1.1 Performance of the High Group on Two-Syllable Loanwords

From the result of the stress marking test (W1) in Table 5.1, one can observe that most high-group students located stress correctly, suggesting that they had knowledge of the stress patterns of most words. This result is supported by the high percentages of the students' correct responses on the oral-reading of words in isolation (R2). However, the data shows that when the students were asked to perform the first task of reading these loanwords in English sentences without knowledge of what was being investigated, they mispronounced these words substantially. As the main goal of the analyses in the present chapter is to explore effects of L1 transfer on the use of stress patterns on English loanwords in a natural speech, the focus will be placed mainly on the students' oral-reading in Task R1.

Results from Table 5.1 indicate that the use of stress in the students' pronunciation of two-syllable loanwords in Task R1 varied substantially. According to the stress patterns and tones in Thai, it may be assumed that the use of the pattern 'o O' in the students' mispronunciation of the words can be caused either by the 'rule of stress on the final syllable', or by a high tone being assigned to the final syllable. From the data presented, *sandwich* /sɛn wít/ is the word mispronounced most by the high-group students, followed by *tennis* /t^{h}en nít/. According to the syllable structure constraints (Gandour, 1979) as described in Section 2.4.2 of Chapter 2, both loanwords are assigned the high tone on the final syllable. Due to the fact that high pitch is the main characteristic of English stress, when a Thai speaker pronounces a syllable in a high tone, there is a high potential that a native English listener perceives the syllable as having stress. Similarly, the final syllable of other two loanwords *office* /ʔɔ́p fít/ and *virus* /waj rát/, which carries the high tone, were also perceived as having stress in the speech of many high-group students.

A possible reason that explains the native English listener's perception of the pattern 'o O' in the words *quota, taxi,* and *dollar* concerns the long duration of vowel sound in the final syllable according to the Thai pronunciation of these words (i.e. /k^{h}woo tâa/, /t^{h}ɛ́k sîi/ and /dɔn lâa/). Full vowel length is regarded as a common feature underlying the perception of stress shared by both English and Thai. Thus, when a syllable is said with a long duration of the vowel sound, it is likely to be interpreted by a native English listener as a stressed syllable. In addition to the vowel length, the final syllable of these three words is assigned the falling tone (or the rising-falling pitch contour), which correlates with the stressed-unstressed English

pattern. The point of the rising in the pitch contour on the second syllable could be perceived as the stress position. This hypothesis could possibly apply to the use of ‘o O’ in the word *fashion* /fɛɛ c^{h}ân/ as its final syllable also carries the rising-falling pitch contour.

Let us consider the loanwords *office* /ʔɔ́p fít/ and *taxi* /t^{h}ék sîi/, which have the high tone on the first syllable. As stated earlier, high pitch is the principal feature of a stressed syllable in English. Thus, when a stressed syllable in English happens to be assigned the high tone, as is the case of *office* and *taxi*, a native English listener tends to perceive the syllable pronounced in a high tone as a stressed syllable. In this case, we may presume a positive L1 transfer effect. However, it cannot be the whole story, as evidenced by the fact that these two words were perceived by the native English listener to be pronounced with the pattern ‘o O’ by many Thai students. A possible reason for this is that, in English, not only is a stressed syllable spoken in a high pitch, an unstressed syllable in that word has to be pronounced softly with a reduced vowel. Thus, although the first syllable is spoken in a high tone by many Thai students, it may not be perceived as a stressed syllable if a long duration of vowel is still maintained on the final syllable according to the typical stress pattern in Thai. This means that the high pitch is not a sole factor for the perception of a stressed syllable.

In comparing the students’ performance on R1 with R2 and W1, we find substantially different results. While many students misplaced stress of two-syllable words in R1, almost all students located stress correctly in R2 and W1. The results suggest that most students were aware of correct stress placement on these loanwords, but they pronounced them differently, presumably as a result of L1 transfer.

Considering the rule of 'stress on the final syllable' applicable to all polysyllabic Thai words (Peyasantiwong, 1986:224), it may be assumed that the use of the pattern 'o O' in the students' mispronunciation of the two-syllable loanwords is caused to a large extent by the negative transfer of the stress pattern on the final syllable in Thai, and the assignment of high tone on an unstressed English syllable.

5.1.2 Performance of the Low Group on Two-Syllable Loanwords

In the pronunciation of two-syllable loanwords in Task R1, the words *sandwich* and *tennis* are those that the low-group students could least pronounce correctly. If one may recall, these two loanwords are also the words least pronounced correctly by the high-group students due to the hypothesis that the final syllable carries the high tone. Other loanwords which are assigned the high tone on the second syllable (i.e. *virus*, *office*, and *bonus*) were perceived as being mispronounced at substantially high percentages. Again, the results from the written test (W1) and the oral-reading of words in isolation (R2) show that most students were in fact aware of the correct stress position of these words.

Let us next consider another set of loanwords whose second syllable carries a long vowel: *dollar*, *quota*, and *taxi*. For these words, vowel length is hypothesized to cause the native English listener to mark many low-group students for placing stress on the second syllable. Interestingly, when the students reread these words in isolation in Task R2, we find that they were able to locate stress correctly at 100%. This suggests that they had cognitive knowledge of where the stress is actually located on these words. We may also observe the results from the stress marking task (W1) which show that only a small number of students misplaced stress on two-syllable

loanwords. The findings reveal that nearly all students were likely to have high competence in stress placement on this category of loanwords. But their performance in less careful speech (R1) did not accord with their competence. The students' mispronunciation of words tended to be influenced to a great extent by the transfer of stress and tone assignment in their L1, and the influence appeared to be greater among less proficient students than those with relatively higher English proficiency.

5.2 Students' Stress Placement of Three-Syllable English Loanwords

Table 5.2: *Students' Correct and Incorrect Stress on Three-Syllable Words*

	Word	Transcription & Thai tones	Words in Sentences (R1)			Words in Isolation (R2)			W1
			☑ **O o o**	☒ o O o	☒ o o O	☑ **O o o**	☒ o O o	☒ o o O	Correct
High Group (n=15)	ˈmicrowave	maj kʰroo wéep	**8 (53.3%)**	1 (6.7%)	6 (40.0%)	**10 (66.7%)**	1 (6.7%)	4 (26.7%)	14 (93.3%)
	ˈalcohol	ʔɛɛn kɔɔ hɔɔ	**8 (53.3%)**	3 (20.0%)	4 (26.7%)	**11 (73.3%)**	1 (6.7%)	3 (20.0%)	14 (93.3%)
	ˈbattery	bèt tə rîi	**10 (66.7%)**	2 (13.3%)	3 (20.0%)	**10 (66.7%)**	5 (33.3%)	0 (0%)	13 (86.7%)
	ˈcalorie	kʰɛɛ lɔ rîi	**11 (73.3%)**	2 (13.3%)	2 (13.3%)	**13 (86.7%)**	2 (13.3%)	0 (0%)	12 (80.0%)
	ˈfurniture	fəə ni cə̂ə	**10 (66.7%)**	5 (33.3%)	0 (0%)	**11 (73.3%)**	4 (26.7%)	0 (0%)	11 (73.3%)
	Mean		**62.7**	17.3	20.0	**73.4**	17.3	9.3	85.3
			☒ O o o	☑ **o O o**	☒ o o O	☒ O o o	☑ **o O o**	☒ o o O	
	corˈruption	kʰɔɔ ráp cʰân	0 (0%)	**15 (100%)**	0 (0%)	1 (6.7%)	**14 (93.3%)**	0 (0%)	14 (93.3%)
	peˈtroleum	pi tro lîam	3 (20.0%)	**12 (80.0%)**	0 (0%)	3 (20.0%)	**12 (80.0%)**	0 (0%)	15 (100%)
	comˈputer	kʰɔm piw tə̂ə	7 (46.7%)	**8 (53.3%)**	0 (0%)	2 (13.3%)	**13 (86.7%)**	0 (0%)	14 (93.3%)
	bacˈteria	bɛ́k ti ria	5 (33.3%)	**10 (66.7%)**	0 (0%)	3 (20.0%)	**11 (73.3%)**	1 (6.7%)	13 (86.7%)
	roˈmantic	roo mɛn tìk	8 (53.3%)	**7 (46.7%)**	0 (0%)	0 (0%)	**14 (93.3%)**	1 (6.7%)	15 (100%)
	Mean		30.7	**69.3**	0	12.0	**85.3**	2.7	94.7
	Word	Transcription & Thai tones	Words in Sentences (R1)			Words in Isolation (R2)			W1
			☑ **O o o**	☒ o O o	☒ o o O	☑ **O o o**	☒ o O o	☒ o o O	Correct
Low Group (n=15)	ˈmicrowave	maj kʰroo wéep	**6 (40.0%)**	0 (0%)	9 (60.0%)	**6 (40.0%)**	2 (13.3%)	7 (46.7%)	10 (66.7%)
	ˈalcohol	ʔɛɛn kɔɔ hɔɔ	**7 (46.7%)**	2 (13.3%)	6 (40.0%)	**9 (60.0%)**	3 (20.0%)	3 (20.0%)	11 (73.3%)
	ˈbattery	bèt tə rîi	**9 (60.0%)**	3 (20.0%)	3 (20.0%)	**11 (73.3%)**	4 (26.7%)	0 (0%)	10 (66.7%)
	ˈcalorie	kʰɛɛ lɔ rîi	**8 (53.3%)**	1 (6.7%)	6 (40.0%)	**9 (60.0%)**	4 (26.7%)	2 (13.3%)	9 (60.0%)
	ˈfurniture	fəə ni cə̂ə	**9 (60.0%)**	6 (40.0%)	0 (0%)	**8 (53.3%)**	7 (46.7%)	0 (0%)	6 (40.0%)
	Mean		**52.0**	16.0	32.0	**57.3**	26.7	16.0	61.3
			☒ O o o	☑ **o O o**	☒ o o O	☒ O o o	☑ **o O o**	☒ o o O	
	corˈruption	kʰɔɔ ráp cʰân	1 (6.7%)	**13 (86.7%)**	1 (6.7%)	0 (0%)	**15 (100%)**	0 (0%)	13 (86.7%)
	peˈtroleum	pi tro lîam	1 (6.7%)	**13 (86.7%)**	1 (6.7%)	0 (0%)	**15 (100%)**	0 (0%)	15 (100%)
	comˈputer	kʰɔm piw tə̂ə	3 (20.0%)	**11 (73.3%)**	1 (6.7%)	1 (6.7%)	**14 (93.3%)**	0 (0%)	15 (100%)
	bacˈteria	bɛ̀k ti ria	5 (33.3%)	**9 (60.0%)**	1 (6.7%)	5 (33.3%)	**10 (66.7%)**	0 (0%)	12 (80.0%)
	roˈmantic	roo mɛn tìk	8 (53.3%)	**6 (40.0%)**	1 (6.7%)	1 (6.7%)	**14 (93.3%)**	0 (0%)	15 (100%)
			24.0	**69.3**	6.7	9.3	**90.7**	0	93.3

Table 5.2 displays the stress patterns of the high-group and low-group students on three-syllable loanwords in the oral-reading tasks R1 and R2. The students' correct stress marking in the written test (W1) is also displayed in the last column. The 10 loanwords in this category are divided into two sets. The first set consists of five

loanwords which carry the primary stress on the first syllable and are represented by the pattern O o o. The remaining five loanwords are those that have stress on the second syllable and are marked by o O o. Students' correct responses for each set of words are shown in bold print. The performance of the high group will be presented first, followed by that of the low group.

5.2.1 Performance of the High Group on Three-Syllable Loanwords

In the first set of three-syllable loanwords having stress on the first syllable, the high-group students placed stress correctly in Task R1 at 62.7% on average. Misplacement of stress on the final syllable was found at 20%, while the students misplaced stress on the second syllable at 17.3%. In Task R2—reading words in isolation, misplacement of stress on the last syllable reduced remarkably from 20% to 9.3%, suggesting that the effect of L1 transfer decreased to a great extent in more careful speech. The word *microwave* /maj k^hroo wéep/ was perceived to have stress on the final syllable at the highest percentage (40%). This could be due to the fact that not only does the final syllable of the word *microwave* carry a long vowel, it is also assigned the high tone in the Thai pronunciation. These two factors contribute to the effect of L1 transfer as earlier discussed. If we check the students' response in Task W1, we find that only 1 student (6.7%) marked stress on *microwave* incorrectly, suggesting that most students had knowledge of where stress should be placed.

The word *alcohol* was found to have stress on the final syllable in the speech of 4 students (26.7%) in R1. This stress pattern was also found in the speech of 3 students (20.0%) in R2. It is observable that this word normally takes a long vowel on the final syllable in the Thai pronunciation. It may be hypothesized that the vowel

length could be a major factor causing the native English listener to perceive the final syllable as having strong stress in R1 and R2. Again, if we check the students' response in Task W1, we find only 1 student (6.7%) marked stress incorrectly on *alcohol*, suggesting that most students had knowledge of the correct stress pattern.

For the words *battery* and *calorie*, misplacement of stress on the final syllable in R1 was found in the speech of 3 students (20%) and 2 students (13.3%) respectively. Two possible reasons appear to cause the native English listener to perceive the last syllable as carrying stress. First, the last syllable of the two words is assigned the falling tone in the Thai pronunciation. As earlier pointed out, the rising-falling pitch contour of the falling tone in Thai correlates with the stress-unstressed English pattern. Second, the final syllable has a long vowel, which is also one crucial characteristic of a stressed syllable in English. It may be hypothesized then that L1 transfer effect is accountable for the perception of stress on the final syllable of these two loanwords. It should be noted that when the students read the words *battery* and *calorie* in Task R2, none of them was heard to pronounce the two words with strong stress on the final syllable. This suggests that L1 transfer effect plays a more crucial role in a natural speech than when the words are carefully spoken.

In the students' performance on the second set of three-syllable loanwords with stress on the second syllable: *corruption, petroleum, computer, bacteria*, and *romantic*, it was found that all misplacement of stress in these five words occurred only on the first syllable. The word *corruption* was pronounced correctly by all high-group students (100%). This is probably because the second syllable, which is a stressed syllable, is assigned the high tone and is thus pronounced with a high pitch. It is observable that in the second group of loanwords, none of the students placed the

primary stress on the final syllable although some of these words end in a long vowel. The reason for this situation is rather unclear, but a possible explanation could be that the students were aware, from their learning experience, that these five words end in a suffix and that most suffixes do not take stress. Thus, they decided to place stress on either the second or first syllable, rather than the final syllable.

Considering the mean values of correct stress on five words in the second set in Task R1, 69.3%, as opposed to those of words in the first set, 62.7%, we find that the students placed stress more correctly on the latter set of loanwords. Such results are confirmed by the students' performance in R2 and W1, whereby the mean values of correct stress on words in the second set are 85.3% and 94.7% respectively. In the first set, the mean values of correct stress on words in R2 and W1 are 73.4% and 85.3% respectively. The fact that most students to located stress correctly in careful speech and in the stress marking task suggest that learners had knowledge of the stress position on words with certain suffixes, such as *–tion*, *–ic*, and *–er*, from their learning experience.

5.2.2 Performance of the Low Group on Three-Syllable Loanwords

Of the five three-syllable loanwords having stress on the first syllable, the low-group students placed stress correctly in Task R1 at 52% on average. Incorrect placement of stress on the second syllable and final syllable was found at 16% and 32%, respectively. As shown in Table 5.2, *microwave* was pronounced with stress on the last syllable at 60% (9 students), followed by *alcohol* and *calorie* at 40% (6 students), and *battery* at 20% (3 students).

When comparing stress misplacement in R1 and R2, one can see that the average percentage of students' placement of stress on the final syllable in R1 reduced by half in R2, that is, from 32% to 16%. On the contrary, misplacement of stress on the second syllable increased from 16% in R1 to 26.7% in R2. The change of stress location in the second task suggests that many students could be aware, when they read the words more carefully, that most English words are less likely to have stress on the final syllable.

In the performance on the second set of three-syllable loanwords in R1 among the low-group students, stress was placed correctly on the second syllable by the majority of the students in almost all words, except for the word *romantic*, which was pronounced correctly by lower than 50% of the students. In this set of words, it was found that misplacement of stress on the last syllable was produced by only 1 student (6.7%) for each of the five words. Moreover, when reading the words in isolation in Task R2, none of the low-group students placed stress on the last syllable in any of these five loanwords. The result suggests that L1 transfer did not occur when words were carefully spoken.

Comparing the mean value of correct stress for loanwords in the first set in Task R1 (52.0%) with that of the second set (69.3%), we find that the low-group students placed stress more correctly on words having stress on the second syllable. This phenomenon is consistent with that of the high-group students. The result supports the aforementioned hypothesis that the students might be aware of the rules of stress on words with suffixes from the course in phonetics they studied in the previous semester. This is evidenced by the fact that when reading words in isolation, the students placed stress correctly on the second set of words at 90.7% on average.

5.3 Students' Stress Placement of Four-Syllable English Loanwords

Table 5.3: *Students' Correct and Incorrect Stress on Four-Syllable Words*

	Word	Transcription & Thai tones	Words in Sentences (R1)				Words in Isolation (R2)				W1
			☑ O o o o	☒ o O o o	☒ o o O o	☒ o o o O	☑ O o o o	☒ o O o o	☒ o o O o	☒ o o o O	Correct
High Group (n=15)	ˈhelicopter	hee li kʰɔ́p tâə	**5 (33.3%)**	0 (0%)	10 (66.7%)	0 (0%)	**6 (40.0%)**	0 (0%)	9 (60.0%)	0 (0%)	6 (40.0%)
	ˈmissionary	mít cʰan na rîi	**5 (33.3%)**	4 (26.7%)	6 (40.0%)	0 (0%)	**3 (20.0%)**	6 (40.0%)	6 (40.0%)	0 (0%)	7 (46.7%)
	ˈsupermarket	súu pâə maa kèt	**1 (6.7%)**	0 (0%)	11 (73.3%)	3 (20.0%)	**3 (20.0%)**	0 (0%)	12 (80.0%)	0 (0%)	5 (33.3%)
	Mean		**24.4**	8.9	60.0	6.7	**26.7**	13.3	60.0	0	40.0
			☒ O o o o	☑ **o O o o**	☒ o o O o	☒ o o o O	☒ O o o o	☑ **o O o o**	☒ o o O o	☒ o o o O	
	techˈnology	tʰék noo loo jîi	8 (53.3%)	**6 (40.0%)**	0 (0%)	1 (6.7%)	0 (0%)	**11 (73.3%)**	4 (26.7%)	0 (0%)	12 (80.0%)
	therˈmometer	tʰəə moo mi tâə	4 (26.7%)	**4 (26.7%)**	6 (40.0%)	1 (6.7%)	0 (0%)	**8 (53.3%)**	7 (46.7%)	0 (0%)	13 (86.7%)
	choˈlesterol	kʰɔɔ rét təə rôn	0 (0%)	**15 (100%)**	0 (0%)	0 (0%)	0 (0%)	**15 (100%)**	0 (0%)	0 (0%)	14 (93.3%)
	Mean		26.7	**55.5**	13.3	4.5	0	**75.5**	24.5	0	86.7
			☒ O o o o	☒ o O o o	☑ **o o O o**	☒ o o o O	☒ O o o o	☒ o O o o	☑ **o o O o**	☒ o o o O	
	aluˈminium	a luu mi nîam	0 (0%)	9 (60.0%)	**6 (40.0%)**	0 (0%)	0 (0%)	8 (53.3%)	**7 (46.7%)**	0 (0%)	7 (46.7%)
	elecˈtronics	i lék tʰrɔ nik	4 (26.7%)	2 (13.3%)	**8 (53.3%)**	1 (6.7%)	0 (0%)	4 (26.7%)	**10 (66.7%)**	1 (6.7%)	12 (80.0%)
	carboˈhydrate	kʰaa boo hai drèet	3 (20.0%)	0 (0%)	**9 (60.0%)**	3 (20.0%)	0 (0%)	1 (6.7%)	**14 (93.3%)**	0 (0%)	10 (66.7%)
	condoˈminium	kʰɔn doo mi nîam	3 (20.0%)	1 (6.7%)	**10 (66.7%)**	1 (6.7%)	0 (0%)	7 (46.7%)	**8 (53.3%)**	0 (0%)	10 (66.7%)
	Mean		16.7	20.0	**55.0**	8.3	0	33.3	**65.0**	1.7	65.0
	Word	Transcription & Thai tones	Words in Sentences (R1)				Words in Isolation (R2)				W1
			☑ O o o o	☒ o O o o	☒ o o O o	☒ o o o O	☑ O o o o	☒ o O o o	☒ o o O o	☒ o o o O	Correct
Low Group (n=15)	ˈhelicopter	hee li kʰɔ́p tâə	**4 (26.7%)**	0 (0%)	10 (66.7%)	1 (6.7%)	**3 (20.0%)**	0 (0%)	12 (80.0%)	0 (0%)	6 (40.0%)
	ˈmissionary	mít cʰan na rîi	**6 (40.0%)**	3 (20.0%)	6 (40.0%)	0 (0%)	**5 (33.3%)**	2 (13.3%)	7 (46.7%)	1 (6.7%)	7 (46.7%)
	ˈsupermarket	súu pâə maa kèt	**0 (0%)**	0 (0%)	10 (66.7%)	5 (33.3%)	**3 (20.0%)**	2 (13.3%)	9 (60.0%)	1 (6.7%)	3 (20.0%)
	Mean		**22.2**	6.7	57.8	13.3	**24.4**	8.9	62.2	4.5	35.6
			☒ O o o o	☑ **o O o o**	☒ o o O o	☒ o o o O	☒ O o o o	☑ **o O o o**	☒ o o O o	☒ o o o O	
	techˈnology	tʰék noo loo jîi	3 (20.0%)	**3 (20.0%)**	3 (20.0%)	6 (40.0%)	0 (0%)	**8 (53.3%)**	7 (46.7%)	0 (0%)	10 (66.7%)
	therˈmometer	tʰəə moo mi tâə	4 (26.7%)	**2 (13.3%)**	7 (46.7%)	2 (13.3%)	2 (13.3%)	**3 (20.0%)**	10 (66.7%)	0 (0%)	10 (66.7%)
	choˈlesterol	kʰɔɔ rét təə rôn	1 (6.7%)	**10 (66.7%)**	0 (0%)	4 (26.7%)	0 (0%)	**15 (100%)**	0 (0%)	0 (0%)	13 (86.7%)
	Mean		17.8	**33.3**	22.2	26.7	4.4	**57.8**	37.8	0	73.4
			☒ O o o o	☒ o O o o	☑ **o o O o**	☒ o o o O	☒ O o o o	☒ o O o o	☑ **o o O o**	☒ o o o O	
	aluˈminium	a luu mi nîam	1 (6.7%)	7 (46.7%)	**7 (46.7%)**	0 (0%)	1 (6.7%)	9 (60.0%)	**4 (26.7%)**	1 (6.7%)	8 (53.3%)
	elecˈtronics	i lék tʰrɔ nik	5 (33.3%)	3 (20.0%)	**7 (46.7%)**	0 (0%)	1 (6.7%)	6 (40.0%)	**8 (53.3%)**	0 (0%)	9 (60.0%)
	carboˈhydrate	kʰaa boo hai drèet	4 (26.7%)	0 (0%)	**9 (60.0%)**	2 (13.3%)	0 (0%)	2 (13.3%)	**13 (86.7%)**	0 (0%)	8 (53.3%)
	condoˈminium	kʰɔn doo mi nîam	0 (0%)	2 (13.3%)	**10 (66.7%)**	3 (20.0%)	0 (0%)	3 (20.0%)	**12 (80.0%)**	0 (0%)	8 (53.3%)
			16.7	20.0	**55.0**	8.3	3.3	33.3	**61.7**	1.7	55.0

Table 5.3 shows the students' correct and incorrect stress placement on four-syllable loanwords in tasks R1 and R2. The students' correct stress marking in the written test (W1) is also displayed in the last column. The 10 loanwords in this category are divided into three sets of words. The first set consists of three loanwords which carry the primary stress on the first syllable and are represented by the pattern O o o o. The second set contains three loanwords having stress on the second syllable marked by o O o o. The remaining four loanwords are those that have stress on the third syllable and are marked by o o O o. Students' correct responses for each set of words are shown in bold print with mean values provided. In the following sub-

sections, the performance of the high group and that of the low group will be presented and discussed.

5.3.1 Performance of the High Group on Four-Syllable Loanwords

As shown in Table 5.3, the high-group students placed stress correctly on the first set of four-syllable loanwords in Task R1 at only 24.4% on average. Misplacement of stress was found on the third syllable at the highest percentage, 60%. In the word *helicopter* /hee li k^hɔ́p tə̂ə/, the third syllable carries the high tone, which correlates a high pitch in a stressed English syllable. This could be a reason why the third syllable was perceived as having strong stress in the speech of 10 students (66.7%) in R1. It is observable that in R2 the same incorrect pattern was perceived in the speech of 9 students (60%). This situation suggests that, in addition to the L1 transfer effect, words with four syllables are difficult for the students to locate stress correctly. As one can see from the result of W1, only 6 students (40%) marked stress correctly for the word *helicopter*.

Supermarket is another word that 11 students (73.3%) placed stress on the third syllable in R1, and 12 students (80%) did so in R2. It could be hypothesized that the students believed that stress should fall on the stressed syllable of the root word, which is the noun *market*. The students possibly thought that the prefix *super* should not take strong stress. Thus, they chose to place stress on the first syllable of the word *market*. As earlier presented and discussed in Chapter 4, most students had insufficient knowledge of the correct stress patterns in four-syllable loanwords. It appears that stress was placed on these words at random. One can see that even when the students read words more carefully in Task R2, or when they had more time to

recall stress rules when performing Task W1, the mean values of correct stress placement in both tasks were still low.

In the second set of four-syllable loanwords having stress on the second syllable, the word *cholesterol* was pronounced with correct stress by all 15 high-group students (100%) in R1. This situation could be due to the fact that the second syllable of this word, which carries the primary stress in English, is assigned the high tone in the Thai pronunciation, and thus was perceived as a stressed syllable in the speech of all students. By contrast, the students' stress placement on the other two words in the same set, *technology* and *thermometer*, appeared to be at random. Interestingly, however, it is observable that in R2 the students chose to place stress on the second or third syllable; stress placement did not occur on the first or last syllable of the word in the second set. This probably concerns their awareness that it is unlikely for stress to fall on the first or last syllable of these words, as evidenced by the high mean value of correct responses in the stress marking task (W1) at 86.7%.

In the third set of four-syllable loanwords, the students tended to place stress at random in R1, but one may observe that the use of stress on the last syllable was minimal. Only the word *carbohydrate* /k^{h}aa boo hai drèet/ was heard to have stress on the final syllable by 3 students (20%). It is assumed that the mispronunciation of this word could be caused by the Thai stress pattern and the long vowel in the final syllable. When the students read this word in Task R2, however, they did not place stress on the last syllable. Another interesting point found in the results for this set of words is that in R2 the students chose to place stress on the third or second syllable.

None of the students placed stress on the first syllable. Moreover, stress on the last syllable was found in only one word *electronics*, pronounced by only one student.

5.3.2 Performance of the Low Group on Four-Syllable Loanwords

Of the three loanwords having stress on the first syllable, the low-group students placed stress correctly in Task R1 at 22.2% on average, suggesting that this group of words is difficult to pronounce with correct stress. Like the high group, the words *helicopter* and *supermarket* were pronounced with stress on the third syllable at the highest percentage, 66.7%. On average, the students placed stress on the third syllable of the words in the first set at 57.8%. When reading these words more carefully in R2, students made only minimal improvement, as evidenced by a slightly higher mean value of correct stress in R2 at 24.4%, as opposed to 22.2% in R1. In addition, misplacement of stress on the third syllable increased from 57.8% in R1 to 62.2% in R2. In the stress marking task (W1), the average percentage of correct mark of stress is only 35.6%. This result suggests that most low-group students' randomly placed stress on this set of loanwords.

In the second set of four-syllable loanwords having stress on the second syllable, the students used stress correctly in R1 at 33.3% on average. The word *cholesterol* shows the highest percentage of correct stress placement at 66.7% (10 students). The percentage increased to 100% in R2 and decreased to 86.7% in W1. As a whole, the students had more correct stress placement for this set of words than they did for words in the first set. This result is consistent with that of the high group, which suggests that stress on the second syllable of four-syllable loanwords could be more accessible to the students than stress placement in other positions in a word.

In the third set of loanwords having stress on the third syllable, the students had correct stress placement in R1 at 55% on average, which is the highest mean value among the three sets. In this set of words, stress was misplaced on the final syllable at 8.3%, while misplacement of stress on the first and second syllables was averaged at 16.7% and 20% respectively. In R2, stress on the final syllable reduced to only 1.7% on average, suggesting that the students were aware that stress on the final syllable is not a typical pattern for four-syllable English words. Likewise, misplacement of stress on the first syllable also decreased from 16.7% in R1 to 3.3% in R2. On the other hand, stress on the second syllable increased from 20% in R1 to 33.3% in R2. Considering the students' correct stress placement in W1 at only 55%, we may hypothesize that the students did not have sufficient knowledge in the stress patterns of four-syllable words. On a whole, the students' use of stress on four-syllable loanwords tended to be at random.

5.4 Summary

This chapter presented results of the qualitative analyses, which aimed at investigating the effect of stress patterns and tones in Thai on the resultant stress patterns of English polysyllabic loanwords in the speech of Thai students, particularly when they read these words with no knowledge of what phonological element was being investigated. The following hypotheses can be assumed from the results of the study.

(1) Full vowel length is the main characteristic of a stressed syllable in both English and Thai. In Thai, the final syllable of a word always carries the strongest stress, and it is normally said with a long duration of vowel. In English, stress is not

fixed on a certain syllable. According to the general rules of English stress, many two-syllable verbs take stress on the final syllable. This stress pattern correlates with the typical stress pattern in Thai words. When Thai speakers pronounce English words having stress on the final syllable, the transfer of L1 is likely to yield a positive effect. However, it is a fact that not so many English words have stress on the final syllable. Thus, pronouncing English words with a long vowel on the final syllable in a typical Thai pattern will yield a negative L1 transfer effect.

(2) Due to the fact that high pitch is the principal feature of stress in English, the syllable which is assigned the high tone in the Thai pronunciation tended to be perceived as having strong stress. When the high tone is assigned to an unstressed English syllable, such a syllable tends to be perceived as a stressed syllable when said in the Thai pronunciation. In this case, the L1 transfer tends to yield a negative effect. On the contrary, if the high tone is assigned to a stressed syllable in English, such a syllable is likely to be perceived as having strong stress. As such, the use of the high tone in Thai tends to yield a position effect. However, in English when one syllable is stressed, the surrounding syllables need to be unstressed, which means that a reduced vowel will be used in unstressed syllables. In this case, if Thai speakers apply the 'rule of stress on the final syllable' in Thai to English words and they still maintain the long duration of vowel sound on the last syllable, strong stress is likely to be perceived on the last syllable. In such a case, the influence of the stress system in Thai will yield a negative L1 transfer effect.

(3) A syllable that is assigned the falling tone, or the rising-falling pitch contour, tends to correlates with the stressed-unstressed English pattern. It appears

that the rising point in the pitch contour of the syllable is perceived as the position of stress in English.

The analyses of the students' performance according to the number of syllables of English loanwords reveal that the students' use of stress in two-syllable loanwords varied considerably across the tasks. Evidence from the high percentages of correct stress marking in Task W1 indicates that the majority of students in both high and low groups were aware of the correct stress patterns in two-syllable words. However, their performance in reading these words in sentences tended to be influenced to a great extent by the transfer of their L1 phonological system. Students appeared to be more careful when pronouncing words with three syllables, particularly those that contain familiar suffixes such as *–tion*, *–ic*, and *–er*. The results show that students hardly placed stress on these suffixes as they were aware from their learning experience that most suffixes do not take stress.

In four-syllable loanwords, the results reveal that students in both groups appeared to place stress more randomly. It is hypothesized that they had insufficient knowledge of the stress patterns of English words containing a larger number of syllables. However, the results show that only a small number of students chose to place stress on the last syllable. One possible reason could be due to the students' awareness that stress does not usually fall on the last syllable in English words containing many syllables.

From the data presented thus far, it may be concluded that the students' pronunciation of two-syllabic loanwords seems to be largely affected by stress patterns and tones in Thai. The students made fewer mistakes in pronouncing words

with three syllables. It is hypothesized that students may not pay much attention to the English stress patterns when saying frequently-used loanwords with a small number of syllables, resulting in their resorting to the Thai way of pronouncing those words in a natural speech.

CHAPTER VI

CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

The purpose of this study was to examine the students' ability, depending on their English proficiency levels, to locate the primary stress in English polysyllabic loanwords in two oral-reading tasks: reading sentences containing the target loanwords, and reading loanwords in isolation. Comparatively, sentence reading is regarded as a less formal style of oral-reading, for the participants do not know which word(s) or what language element is being examined. Word reading, on the other hand, allows the participants to know the target words; thus, it is anticipated that the participants will try to use their mental skills and read those words more carefully. The results of the students' performance on the two oral-reading tasks were then compared the results with the results of the third task, marking stress on the target words in a written test. This task was intended to use for measuring the students' underlying knowledge of the English stress patterns of these loanwords. The goal was to investigate relationships between the students' competence of the English stress patterns and their actual performance in reading these loanwords out loud in English sentences and in isolation. The study also aimed to determine the extent to which stress and tone in Thai have an effect on the resultant stress patterns in the pronunciation of these loanwords among Thai students in the English major program, as perceived by a native English listener.

In light of the above objectives, the present study sought to answer the following questions addressed in Chapter 1:

(1) Depending on levels of English proficiency, are there any differences in the students' ability to locate the primary stress correctly in two types of speech: reading the target loanwords in English sentences, and reading these words in isolation, as opposed to the stress marking task?

(2) Are there relationships between the students' competence of stress patterns of English polysyllabic loanwords and their performance in actually pronouncing these words in the oral-reading tasks?

(3) To what extent is there an effect of stress patterns and tones in Thai on the resultant stress patterns of English polysyllabic loanwords in the pronunciation of Thai EFL students in an English major program as perceived by a native English listener?

The following hypotheses were therefore formulated and tested:

(1) The students with relatively higher levels of English proficiency are more aware of the English stress patterns of these loanwords, and therefore, are more capable of locating stress correctly than those with lower levels of English proficiency, particularly in the stress marking task. However, the more syllables a word has, the more difficult it is for the students to place stress correctly.

(2) The students' competence of stress patterns of English polysyllabic loanwords may not correlate with their pronunciation of those words in the English source language, suggesting that they have difficulty pronouncing words with correct stress placement.

(3) Stress patterns in the pronunciation of English polysyllabic loanwords among Thai students, as perceived by a native English listener, are affected by stress

patterns in Thai and tone adaptation of these loanwords even when these words are pronounced in the context of English sentences.

In this concluding chapter, the main findings of the study will be summarized. Then, pedagogical implications drawn from the study will be presented. The final section of this chapter will offer some recommendations for future research.

6.1 The Main Findings of the Study

In testing Hypothesis 1, stress placement of the 2 sample groups were analyzed quantitatively. The analyses were conducted to investigate the performance on reading the target loanwords in the two oral-reading tasks as opposed to stress marking on the written test among Thai students with two different levels of English proficiency.

The results of the experiment revealed that, of the three tasks, students in both groups had the highest degree of correct stress placement in stress marking (W1) task, followed by the oral-reading of loanwords in isolation (R2). The students could least pronounce loanwords in English sentences (R1) with correct stress placement. The findings indicate that students performed best on the task that did not require spontaneous responses, for they had time to derive rules or guidelines of English stress patterns from their competence. As regards the two oral-reading tasks, reading sentences is a less formal type of oral-reading than reading words in isolation, for the students are not aware of what element is being tested. Besides, in this study reading sentences was the first task that the students were asked to perform. When instructed to read words on a list in Task R2, the students became aware of the target words being investigated; therefore, they paid greater attention to those words and read them

more carefully. This explains why the students had a higher degree of accuracy when reading loanwords in isolation. In testing the difference in performing the three tasks between the two proficiency groups, the t-test results show that the high group outperformed the low group at a statistically significant level in Task R2 and Task W1. The finding suggests that students with relatively higher English proficiency level have higher competence and are more capable of placing stress correctly in tasks that require conscious attention to the English stress patterns.

In further examining stress placement of these loanwords classified into three categories according to the number of syllables, the results revealed that in Task R1, the students in both groups read loanwords with three syllables in sentences more correctly than loanwords with two syllables. This finding contradicts results from Wattanapokakul's (2009) study, reporting that the more syllable a word has, the more mistakes the students make in terms of stress placement. One possible reason that might explain the result of this study is that the students were likely to pay less attention to stress on familiar loanwords with a small number of syllables, resulting in their reading those two-syllable words in the Thai way. For four-syllable loanwords, the students had substantial difficulty with stress. This finding confirms results of earlier studies that words with many syllables are challenging to students to pronounce with correct stress placement. The t-test results show no significant difference in the performance of the high and low groups in any of the three categories of loanwords when reading sentences.

In Task R2, the degree of correct stress placement decreased as the number of syllables increased. Statistical testing results show a significant difference in the ability to read loanwords with two syllables, but not those with three and four

syllables. The results suggest that loanwords with higher numbers of syllables are challenging to pronounce correctly by both groups, even in a more careful style of oral-reading.

In Task W1, students in both groups marked stress more correctly on all categories of loanwords than when they read these words in the oral-reading tasks. Between the two proficiency groups, there was a significant difference in the ability to mark stress on three-syllable loanwords, suggesting that knowledge of the English stress patterns in three-syllable loanwords of lower proficient students differ from that of higher proficient students. This finding also implies that both groups showed no significant difference in their competence for stress on loanwords with two syllables and four syllables.

To conclude, the findings support the first hypothesis, stating that higher proficient learners are more capable of locating stress correctly than lower proficient learners, particularly in the stress marking task, for they tend to be more aware of the English stress patterns. However, the more syllables a word has, the more difficult it is for the students, irrespective of English proficiency levels, to place stress correctly.

With respect to the second hypothesis, a statistically significant correlation was found between the students' ability to mark stress in Task W1 and their ability to pronounce loanwords in isolation (R2) at the 0.01 level. This finding suggests a relationship between the students' competence of stress patterns and performance in locating stress when they read the loanwords in a more careful style of oral-reading.

In the investigation of relationships between stress marking and the students' pronunciation of loanwords according to the number of syllables, the results from

Pearson correlation reveal no significant correlation between the students' ability to mark stress and their ability to pronounce two-syllable loanwords in both oral-reading tasks. This possibly indicates when reading loanwords with two syllables, the students' did not pay sufficient attention to the stress patterns, resulting in their inconsistent use of stress on different task types. For loanwords with three syllables, the results show a significant correlation between stress marking and reading loanwords in isolation, but not between stress marking and reading the words in sentences. This finding suggests that only in careful oral-reading of the three-syllable loanwords does the students' performance accord with their competence of the stress patterns. For loanwords with four syllables, the results show a low level of relationship, demonstrating no significant correlation between stress marking and the two oral-reading tasks. It was hypothesized that the students possibly locate stress at random when performing each task due to insufficient knowledge of the stress patterns of words with a high number of syllables.

To conclude, the test results support the second hypothesis, for the most part, that the students' ability to mark stress did not correlate significantly with the use of stress in their actual pronunciation of those words. When performing the oral-reading of frequently-used two-syllable words, the students tended to resort to L1 pronunciation, and when pronouncing four-syllable loanwords, the students appeared to place stress at random due to the difficulty in using correct stress patterns.

In testing the third hypothesis, it was found that a great number of students, particularly those in the low group, mispronounced two-syllable loanwords when reading them in sentences. Misplacement of stress on two-syllable loanwords could be hypothesized to result from L1 transfer as stress in Thai is always on the last syllable,

irrespective of the number of syllable in a word. In addition, the L1 transfer effect was greater when the students read the sentences without awareness of what element was being investigated. Their familiarity with the Thai way of pronouncing frequently-used loanwords plays a crucial role in a less formal type of speech.

For three-syllable loanwords, it was found that only a small number of students placed stress on the last syllable of loanwords ending with suffixes that they were familiar with, such as *–tion, –ic, –er*. This finding suggests that the students were aware, from their learning experience, that certain suffixes do not take stress. Thus, they chose to place stress either on the second or first syllable instead. For three-syllable loanwords that do not end in familiar suffixes, misplacement of stress on the last syllable was found at considerable percentages, particularly among lower proficient learners. This type of stress error was hypothesized to result from the negative L1 transfer effect.

For four-syllable loanwords, it appears that the students in both groups placed stress quite randomly due to the fact that four-syllable words are difficult to pronounce with correct stress placement.

From the results of the study, it may be assumed that stress was perceived by a native English listener based on the following hypotheses.

(1) Since Thai has stress on the last syllable, which is recognizable by the long duration of vowel sound, the transfer of using a long vowel on the last syllable of English words is likely to cause a native English listener to perceive it as a stressed syllable.

(2) An English unstressed syllable, when assigned the high tone in the Thai pronunciation, tends to be perceived as a stressed syllable by a native English listener. On the contrary, an English stressed syllable, if assigned a tone other than high, such a syllable is likely to be heard as an unstressed syllable, unless otherwise it is in the syllable-final position and is pronounced in a long vowel.

(3) An English syllable that is assigned the falling tone is likely to be perceived as a stressed syllable because the rising-falling pitch contour conveyed by the Thai falling tone tends to correlates with the stressed-unstressed English pattern, and it is normally perceived as the stress position in English.

To conclude, it can be found that the students' use of stress in reading two-syllable loanwords in the most informal type of oral-reading (Task R1) was likely to be influenced to a large extent by L1 interference. The students in both groups appeared to ignore the English stress patterns in two-syllable loanwords when reading them with no knowledge of the target elements, and thus familiarity with the Thai pronunciation of these two-syllable loanwords played a crucial role. The results show that students became more aware of English stress patterns when they read three-syllable loanwords, particularly when they came across words with familiar suffixes, on which they had learned that stress would not fall on the last syllable. For four-syllable loanwords, the results show that the majority of students tended to have insufficient knowledge of the correct stress patterns; therefore, their stress placement was inconsistent in different task types. It appears that the students located stress at random.

6.2 Implications of the Study

This study addressed the problems in using correct stress patterns when pronouncing English loanwords in the English context. The findings of this study offer some pedagogical implications.

Firstly, it is clear that word stress is an important element in English for rendering communication intelligibility. Students should always be careful in pronouncing English words with correct stress placement if an acceptable mastery of spoken English is a learning goal.

Secondly, the findings of the study are likely to help both teachers and students become more aware of the importance of English word stress and avoid using Thai intonation and stress patterns when pronouncing loanwords in the English language context.

Lastly, knowing the similarities and differences of the English and Thai stress systems may help teachers to develop an informed method to teach word stress patterns in English polysyllabic words. It is important that teachers emphasize the use of full vowel in stressed syllables and reduced vowel in unstressed syllables of English words, especially when the final syllable is unstressed. In addition, the teachers need to discuss the concepts of tones and stress and demonstrate to the students how tone assignment on a syllable can affect the perception of stress in English words. The students should be taught how to avoid using the high pitch on unstressed syllable when pronouncing the word in the English context even though that syllable is assigned the high tone in the Thai pronunciation.

6.3 Recommendations for Further Research

Based on the main findings of the study, the following recommendations are made for further research.

Firstly, this study is limited by a small sample size. Future research can be extended with larger groups of participants so as to validate the relationship between the students' competence of stress patterns of polysyllabic loanwords and their actual performance in pronouncing these words more objectively.

Secondly, because this study was conducted in one EFL context, it may not be generalizable to students of other English learning contexts. A study of similar nature can be conducted with different groups of participants so as to gain insights and varying perspectives for comparison.

Finally, future research may also be conducted to investigate English loanwords having the primary stress on every syllable position in a word, including the syllable-final position. The results may provide further insights into other types of learners' errors, such as the overgeneralization of the English stress rules.

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APPENDIX A

Participants in the Study

	No.	Code	Gender	DPU-TEP	GPA
High Group	1	H01	F	52.50	3.64
	2	H02	F	53.33	3.01
	3	H03	F	52.50	3.58
	4	H04	M	65.83	3.07
	5	H05	F	52.50	3.27
	6	H06	F	52.67	3.06
	7	H07	F	53.17	3.68
	8	H08	F	63.33	3.43
	9	H09	M	52.67	3.52
	10	H10	F	54.17	3.06
	11	H11	F	52.83	3.22
	12	H12	M	53.33	3.02
	13	H13	F	53.67	3.45
	14	H14	F	52.50	3.52
	15	H15	F	53.33	3.24
Low Group	16	L01	F	37.83	2.08
	17	L02	F	38.17	2.37
	18	L03	F	35.83	2.33
	19	L04	F	38.33	2.34
	20	L05	F	31.67	2.10
	21	L06	F	38.33	2.20
	22	L07	F	38.33	2.48
	23	L08	M	32.50	2.39
	24	L09	F	37.83	2.36
	25	L10	M	38.17	2.50
	26	L11	F	36.17	2.00
	27	L12	F	36.17	2.36
	28	L13	F	35.00	2.44
	29	L14	F	23.33	1.68
	30	L15	F	31.67	2.43

APPENDIX B

Reading Part A

Please read the following sentences.

1. There is a small supermarket near my house.
2. The company paid him a big bonus.
3. Chlorine is widely used to kill bacteria.
4. A helicopter crashed into a building last night.
5. Jack gives me a ride to the office every morning.
6. A condominium near a BTS station is very expensive.
7. Perfumes and cleaning fluids contain alcohol.
8. Jane connected the microphone to a computer.
9. Too much cholesterol in the blood can cause heart disease.
10. Japan has decreased the import quota on shrimps.
11. His house is full of antique furniture.
12. He printed documents from a laser printer.
13. Most plastic is made from petroleum.
14. Anna started playing tennis last year.
15. To control weight, avoid high calorie foods.
16. Korean fashion is very popular in Thailand.
17. Microwave ovens are not suitable for grilling.
18. These pots and pans are made from aluminium.
19. A thermometer is a tool to measure temperature.
20. Yaya likes to watch romantic movies.
21. One of my school teachers was a missionary.
22. The bird flu virus can pass from human to human.
23. Korea is famous for the electronics industry.
24. The director is facing many charges of corruption.
25. Low carbohydrate diets help people lose weight quickly.
26. My mother made me a tuna sandwich for lunch.
27. I need a battery for my new camera.
28. Modern technology can help reduce production costs.
29. Mary decided to take a taxi to the airport.
30. She handed a ten dollar bill to the cashier.

APPENDIX C

Reading Part B

Please read the words on the list below.

1.	thermometer	11.	quota	21.	helicopter
2.	sandwich	12.	condominium	22.	bonus
3.	furniture	13.	petroleum	23.	corruption
4.	carbohydrate	14.	dollar	24.	cholesterol
5.	office	15.	technology	25.	taxi
6.	calorie	16.	computer	26.	electronics
7.	aluminium	17.	romantic	27.	alcohol
8.	tennis	18.	supermarket	28.	microwave
9.	bacteria	19.	fashion	29.	virus
10.	laser	20.	missionary	30.	battery

APPENDIX D

Writing Test

Please put the stress mark (ˈ) on the correct syllable.

1.	thermometer	11.	quota	21.	helicopter
2.	sandwich	12.	condominium	22.	bonus
3.	furniture	13.	petroleum	23.	corruption
4.	carbohydrate	14.	dollar	24.	cholesterol
5.	office	15.	technology	25.	taxi
6.	calorie	16.	computer	26.	electronics
7.	aluminium	17.	romantic	27.	alcohol
8.	tennis	18.	supermarket	28.	microwave
9.	bacteria	19.	fashion	29.	virus
10.	laser	20.	missionary	30.	battery

APPENDIX E

Oral-Reading Task R1

			Sentence Reading (R1)																																			
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
1	taxi	● o	1		1		1		1		1	1	1	1	1	1			1			1			1	1	1		1	1	1	1	10	9	19
		o ●		1		1		1		1							1	1		1	1		1	1				1					5	6	11
2	sandwich	● o			1									1	1							1				1			1				3	3	6
		o ●	1	1		1	1	1	1	1	1	1	1			1	1	1	1	1	1		1	1	1		1	1		1	1	1	12	12	24
3	dollar	● o	1	1		1	1		1		1	1	1	1	1	1						1			1	1			1			1	11	5	16
		o ●			1			1		1							1	1	1	1	1		1	1			1	1		1	1			4	10	14
4	bonus	● o	1	1	1	1		1	1	1	1	1	1		1	1	1		1	1	1	1			1	1	1	1					13	8	21
		o ●					1							1				1					1	1					1	1	1	1	2	7	9
5	office	● o	1			1		1				1	1	1	1	1	1		1		1	1			1	1		1			1		9	7	16
		o ●		1	1		1		1	1	1							1		1			1	1			1		1	1		1	6	8	14
6	quota	● o		1			1		1			1	1	1	1	1					1				1	1	1				1	1	8	6	14
		o ●	1		1	1		1		1	1						1	1	1	1		1	1	1				1	1	1			7	9	16
7	fashion	● o	1	1		1	1		1	1		1	1	1	1	1			1		1	1			1	1	1	1	1		1	1	11	10	21
		o ●			1			1			1						1	1		1			1	1						1			4	5	9
8	tennis	● o	1		1								1	1	1	1			1			1				1							6	3	9
		o ●		1		1	1	1	1	1	1	1					1	1		1	1		1	1	1		1	1	1	1	1	1	9	12	21
9	virus	● o	1	1	1			1		1		1	1	1	1	1			1		1					1	1		1				10	5	15
		o ●				1	1		1		1						1	1		1		1	1	1	1			1		1	1	1	5	10	15
10	laser	● o	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1		1	1			1	1	1	1	1	1	1	1	14	12	26
		o ●						1												1			1	1									1	3	4

			Sentence Reading (R1)																																			
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
11	calorie	● o o	1	1				1	1		1	1	1	1	1	1	1		1		1				1	1	1	1		1		1	11	8	19
		o ● o			1		1																								1		2	1	3
		o o ●				1				1								1		1		1	1	1					1				2	6	8
12	furniture	● o o	1			1		1			1	1	1	1	1	1	1	1						1	1		1	1	1	1	1	1	10	9	19
		o ● o		1	1		1		1	1									1	1	1	1				1							5	6	11
		o o ●																															0	0	0
13	microwave	● o o		1	1				1				1	1	1	1	1				1	1				1	1		1		1		8	6	14
		o ● o					1																										1	0	1
		o o ●	1			1		1		1	1	1						1	1	1			1	1	1		1		1			1	6	9	15
14	alcohol	● o o			1			1			1	1	1		1	1	1	1			1	1			1	1	1		1				8	7	15
		o ● o		1			1		1																						1	1	3	2	5
		o o ●	1			1				1				1					1	1			1	1				1		1			4	6	10
15	battery	● o o	1				1		1	1	1	1	1	1		1	1			1	1	1				1	1		1	1	1	1	10	9	19
		o ● o		1	1													1	1					1									2	3	5
		o o ●				1		1							1								1	1				1						3	3	6
16	computer	o ● o		1	1	1		1			1		1		1	1		1	1		1	1		1	1	1	1		1	1	1		8	11	19
		● o o	1				1		1	1		1		1			1						1				1					1	7	3	10
		o o ●																	1														0	1	1
17	petroleum	o ● o		1	1	1	1	1	1	1	1		1	1	1	1		1		1	1	1	1	1	1	1	1	1	1	1	1		12	13	25
		● o o	1									1					1													1	3	1	4
		o o ●																1															0	1	1
18	bacteria	o ● o			1	1	1	1	1	1	1	1	1			1		1		1	1	1	1			1	1	1	1				10	9	19
		● o o	1	1									1	1		1	1							1	1					1	1	6	5	11
		o o ●																	1														0	1	1
19	romantic	o ● o		1	1				1		1	1	1			1			1		1			1	1	1				1		7	6	13
		● o o	1			1	1	1		1				1	1		1	1	1		1		1				1	1	1		1	10	8	18
		o o ●																					1										0	1	1
20	corruption	o ● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1		1	15	13	28
		● o o																										1					0	1	1
		o o ●																													1		0	1	1

Sentence Reading (R1)																																					
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
21	helicopter	● o o o							1				1	1		1	1			1	1	1						1					5	4	9
		o ● o o																															0	0	0
		o o ● o	1	1	1	1	1	1		1	1	1			1				1				1	1	1	1	1		1	1	1	1	10	10	20
		o o o ●																1															0	1	1
22	missionary	● o o o			1							1	1			1	1		1		1			1	1				1		1	5	6	11
		o ● o o						1	1	1	1															1	1			1		4	3	7
		o o ● o	1	1		1	1						1	1				1		1		1	1			1			1				6	6	12
		o o o ●																															0	0	0
23	supermarket	● o o o												1																			1	0	1
		o ● o o																															0	0	0
		o o ● o	1	1			1	1	1	1	1	1	1		1	1			1		1	1	1		1	1	1		1		1	1	11	10	21
		o o o ●			1	1											1	1		1				1				1		1			3	5	8
24	technology	o ● o o			1		1	1		1			1	1					1						1	1							6	3	9
		● o o o	1	1					1		1	1			1	1	1				1						1					1	8	3	11
		o o ● o																				1		1							1		0	3	3
		o o o ●				1												1		1			1					1	1	1			1	6	7
25	thermometer	o ● o o		1				1	1				1								1						1						4	2	6
		● o o o									1	1		1			1		1	1											1	1	4	4	8
		o o ● o			1	1	1			1					1	1					1		1		1	1	1		1	1	1			6	7	13
		o o o ●	1															1				1											1	2	3
26	cholesterol	o ● o o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1	1	1			1	1	1	1	1	1		1	15	10	25
		● o o o																													1		0	1	1
		o o ● o																															0	0	0
		o o o ●																1	1				1	1										0	4	4

Sentence Reading (R1)																																					
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
27	aluminium	o o ● o		1		1	1						1		1	1				1		1	1	1	1				1			1	6	7	13
		● o o o																	1														0	1	1
		o ● o o	1		1			1	1	1	1	1		1			1	1			1					1	1	1		1	1		9	7	16
		o o o ●																															0	0	0
28	electronics	o o ● o	1				1	1	1	1			1		1	1		1	1			1	1		1	1	1						8	7	15
		● o o o		1							1			1			1			1	1						1		1		1	4	5	9
		o ● o o			1							1												1				1		1			2	3	5
		o o o ●				1																											1	0	1
29	carbohydrate	o o ● o		1			1	1	1		1	1	1		1		1			1		1	1	1	1	1			1	1	1		9	9	18
		● o o o			1									1		1			1		1						1	1					3	4	7
		o ● o o																															0	0	0
		o o o ●	1			1				1								1														1	3	2	5
30	condominium	o o ● o			1	1	1	1		1	1	1			1	1	1		1					1	1	1	1	1	1	1	1	1	10	10	20
		● o o o							1				1	1																			3	0	3
		o ● o o		1																	1	1											1	2	3
		o o o ●	1															1		1			1										1	3	4

APPENDIX F

Oral-Reading Task R2

			Word Reading (R2)																															
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
1	taxi	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
2	sandwich	● o	1	1	1		1		1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1			1		13	11	24
		o ●				1		1											1										1	1		1	2	4	6
3	dollar	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
4	bonus	● o	1		1	1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1	1		1	1	1				1	14	9	23
		o ●		1														1		1					1				1	1	1		1	6	7
5	office	● o		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1			1		14	11	25
		o ●	1																		1								1	1		1	1	4	5
6	quota	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
7	fashion	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
8	tennis	● o	1		1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1	1	1	1			1		14	10	24
		o ●		1														1				1							1	1		1	1	5	6
9	virus	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1		15	12	27
		o ●																											1	1		1	0	3	3
10	laser	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0

			Word Reading (R2)																															
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
11	calorie	● o o	1	1	1	1		1	1	1	1	1	1	1		1	1	1		1	1		1		1	1	1		1			1	13	9	22
		o ● o					1								1				1			1		1							1		2	4	6
		o o ●																										1		1			0	2	2
12	furniture	● o o	1	1	1	1		1			1	1		1	1	1	1	1					1	1	1			1	1	1		1	11	8	19
		o ● o					1		1	1			1						1	1	1	1				1	1				1		4	7	11
		o o ●																															0	0	0
13	microwave	● o o		1	1		1	1	1			1	1	1		1	1			1	1	1	1			1					1		10	6	16
		o ● o								1								1					1										1	2	3
		o o ●	1			1					1				1		1							1		1	1	1	1		1	4	7	11
14	alcohol	● o o	1	1	1			1	1	1		1	1	1		1	1		1	1	1	1	1			1			1	1	1		11	9	20
		o ● o													1									1	1		1						1	3	4
		o o ●				1	1				1							1								1						1	3	3	6
15	battery	● o o	1		1		1	1	1		1	1		1		1	1		1	1	1	1			1	1	1	1	1		1	1	10	11	21
		o ● o		1		1				1			1		1			1					1	1					1				5	4	9
		o o ●																														1	0	1	1
16	computer	o ● o	1	1	1	1	1	1	1	1	1		1		1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	13	14	27
		● o o										1		1									1										2	1	3
		o o ●																															0	0	0
17	petroleum	o ● o		1		1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	12	15	27
		● o o	1		1											1																	3	0	3
		o o ●																															0	0	0
18	bacteria	o ● o	1	1	1	1		1	1	1		1	1		1	1			1	1	1	1	1	1		1		1	1	1			11	10	21
		● o o					1				1			1				1						1		1				1	1	3	5	8
		o o ●															1																1	0	1
19	romantic	o ● o	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	14	14	28
		● o o																													1		0	1	1
		o o ●													1																		1	0	1
20	corruption	o ● o	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	15	29
		● o o		1																													1	0	1
		o o ●																															0	0	0

			Word Reading (R2)																																
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
21	helicopter	● o o o	1	1	1					1			1			1				1	1		1										6	3	9
		o ● o o																															0	0	0
		o o ● o				1	1	1	1		1	1		1	1		1	1	1			1		1	1	1	1	1	1	1	1	1	9	12	21
		o o o ●																															0	0	0
22	missionary	● o o o		1	1						1										1		1		1		1					1	3	5	8
		o ● o o	1					1		1		1		1		1		1													1		6	2	8
		o o ● o				1	1		1				1		1		1		1	1		1		1		1		1		1				6	7	13
		o o o ●																											1				0	1	1
23	supermarket	● o o o		1	1			1													1		1							1			3	3	6
		o ● o o																1										1					0	2	2
		o o ● o	1			1	1		1	1	1	1	1	1	1	1		1	1		1		1	1	1	1		1		1			12	9	21
		o o o ●																														1	0	1	1
24	technology	o ● o o	1		1	1	1	1	1	1	1	1		1		1		1	1		1				1	1	1	1			1		11	8	19
		● o o o																															0	0	0
		o o ● o		1									1		1		1			1		1	1	1				1	1		1	4	7	11
		o o o ●																															0	0	0
25	thermometer	o ● o o	1	1	1		1	1	1		1	1						1			1							1					8	3	11
		● o o o																				1	1										0	2	2
		o o ● o				1				1			1	1	1	1	1		1	1				1	1	1	1		1	1	1	1	7	10	17
		o o o ●																															0	0	0
26	cholesterol	o ● o o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		● o o o																															0	0	0
		o o ● o																															0	0	0
		o o o ●																															0	0	0

			Word Reading (R2)																																
No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
27	aluminium	o o ● o			1	1	1						1		1	1	1						1						1	1		1	7	4	11
		● o o o																									1						0	1	1
		o ● o o	1	1				1	1	1	1	1		1				1	1	1	1	1			1	1		1			1		8	9	17
		o o o ●																						1									0	1	1
28	electronics	o o ● o	1	1		1			1			1	1	1	1	1	1	1					1		1	1		1	1	1	1		10	8	18
		● o o o																														1	0	1	1
		o ● o o			1			1		1	1							1	1	1	1		1			1							4	6	10
		o o o ●					1																										1	0	1
29	carbohydrate	o o ● o	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	14	13	27
		● o o o																															0	0	0
		o ● o o						1													1						1						1	2	3
		o o o ●																															0	0	0
30	condominium	o o ● o			1	1	1					1	1	1	1		1		1	1	1	1	1	1	1		1		1	1	1	1	8	12	20
		● o o o																															0	0	0
		o ● o o	1	1				1	1	1	1					1		1								1		1					7	3	10
		o o o ●																															0	0	0

APPENDIX G

Stress Marking Task W1

Stress Marking (W1)

No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
1	taxi	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
2	sandwich	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	15	14	29
		o ●																											1			0	1	1
3	dollar	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1			1		1	1	1	15	12	27
		o ●																								1	1		1				0	3	3
4	bonus	● o	1		1	1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1		1	1	1		1		1	1	14	10	24
		o ●		1														1		1				1				1		1			1	5	6
5	office	● o	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1		1	1	14	13	27
		o ●					1																		1					1			1	2	3
6	quota	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
7	fashion	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	15	14	29
		o ●																									1						0	1	1
8	tennis	● o	1		1	1		1	1	1	1	1	1	1		1	1		1	1	1	1		1	1	1	1	1		1	1	12	12	24
		o ●		1			1								1			1						1					1			3	3	6
9	virus	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		o ●																															0	0	0
10	laser	● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1		1		1	1	1	1	1	15	13	28
		o ●																							1		1						0	2	2

Stress Marking (W1)

No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
11	calorie	● o o	1	1	1	1		1	1	1		1	1	1		1	1	1		1	1	1	1	1			1		1			1	12	9	21
		o ● o					1				1				1				1						1	1		1		1	1		3	6	9
		o o ●																															0	0	0
12	furniture	● o o		1	1			1		1	1	1	1	1	1	1	1	1		1	1		1		1								1	11	6	17
		o ● o	1			1	1		1										1			1		1		1	1	1	1	1		4	9	13
		o o ●																															0	0	0
13	microwave	● o o	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1	1		1	1	1		1			1	14	10	24
		o ● o													1			1						1			1			1		1	4	5
		o o ●																												1			0	1	1
14	alcohol	● o o	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1		1	1	1	1	1		1	1		1	1		1	14	11	25
		o ● o													1			1						1			1			1		1	4	5
		o o ●																															0	0	0
15	battery	● o o	1		1	1	1	1	1	1	1	1	1	1		1	1	1		1	1		1		1	1	1		1	1		1	13	10	23
		o ● o		1											1			1				1		1			1			1		2	5	7
		o o ●																															0	0	0
16	computer	o ● o	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	14	15	29
		● o o										1																					1	0	1
		o o ●																															0	0	0
17	petroleum	o ● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		● o o																															0	0	0
		o o ●																															0	0	0
18	bacteria	o ● o	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	1				1	1	1	1	1	13	12	25
		● o o					1						1												1	1	1						2	3	5
		o o ●																															0	0	0
19	romantic	o ● o	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	15	15	30
		● o o																															0	0	0
		o o ●																															0	0	0
20	corruption	o ● o	1		1	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1	1	1	1	1		1	1	1	1	14	13	27
		● o o		1														1															1	1	2
		o o ●																										1					0	1	1

Stress Marking (W1)

No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
21	helicopter	● o o o		1	1			1		1	1		1					1			1	1	1				1				1	6	6	12
		o ● o o																															0	0	0
		o o ● o	1			1	1		1			1		1	1	1	1		1	1				1	1	1		1	1	1	1		9	9	18
		o o o ●																															0	0	0
22	missionary	● o o o	1		1			1	1	1	1						1				1	1	1		1		1		1	1			7	7	14
		o ● o o		1								1						1						1			1			1			2	4	6
		o o ● o				1	1						1	1	1	1			1	1						1						1	6	4	10
		o o o ●																															0	0	0
23	supermarket	● o o o			1			1		1	1						1				1	1							1				5	3	8
		o ● o o																1									1				1	0	3	3
		o o ● o	1	1		1	1		1			1	1	1	1	1			1	1			1	1	1	1	1		1		1		10	9	19
		o o o ●																															0	0	0
24	technology	o ● o o	1		1	1	1	1	1	1	1	1			1	1	1	1			1	1		1		1	1	1	1	1		1	12	10	22
		● o o o		1										1																			2	0	2
		o o ● o											1						1	1			1		1						1		1	5	6
		o o o ●																															0	0	0
25	thermometer	o ● o o	1	1	1	1	1	1	1	1		1		1	1	1	1	1				1	1	1		1	1	1	1	1	1		13	10	23
		● o o o																															0	0	0
		o o ● o									1		1						1	1	1				1							1	2	5	7
		o o o ●																															0	0	0
26	cholesterol	o ● o o	1	1	1	1	1	1	1	1	1	1	1	1		1	1	1	1	1		1	1	1	1	1	1		1	1	1	1	14	13	27
		● o o o																															0	0	0
		o o ● o													1						1							1					1	2	3
		o o o ●																															0	0	0

Stress Marking (W1)

No.	Word	Pattern	H01	H02	H03	H04	H05	H06	H07	H08	H09	H10	H11	H12	H13	H14	H15	L01	L02	L03	L04	L05	L06	L07	L08	L09	L10	L11	L12	L13	L14	L15	High	Low	Total
27	aluminium	o o ● o			1			1			1		1	1	1	1			1			1	1	1	1			1	1		1		7	8	15
		● o o o																														1	0	1	1
		o ● o o	1	1		1	1		1	1		1					1	1		1	1					1	1			1			8	6	14
		o o o ●																															0	0	0
28	electronics	o o ● o			1	1	1	1		1	1	1	1	1	1	1	1		1			1	1	1	1	1		1		1	1		12	9	21
		● o o o																			1												0	1	1
		o ● o o	1	1					1									1		1						1		1			1	3	5	8
		o o o ●																															0	0	0
29	carbohydrate	o o ● o			1	1	1	1		1			1	1	1	1	1		1	1	1	1	1	1		1				1			10	8	18
		● o o o									1														1		1						1	2	3
		o ● o o	1	1					1			1					1										1	1		1			4	4	8
		o o o ●																														1	0	1	1
30	condominium	o o ● o		1	1		1	1		1			1	1	1	1	1		1	1	1	1	1		1				1	1			10	8	18
		● o o o	1								1																						2	0	2
		o ● o o				1			1			1					1						1		1	1	1	1					3	6	9
		o o o ●																														1	0	1	1