

IT Staff's Ability Identifying Stress Patterns of English Words and Listening Comprehension Ability

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ABSTRACT

In English language, word stress patterns play an important role in the overall phonetic quality of speech. Word stress patterns provide useful clues for meanings and the patterns can also affect comprehension. Spoken words with correct sounds but wrong stress placements are more difficult to comprehend than words with the correct word stress but incorrect sounds. Therefore, incorrect stress may lead to misunderstanding and cause problems in listening ability. This study aims to investigate the IT staff's ability to identify stress patterns of English words in IT documents and explore the relationship between the IT staff's ability to identify stress patterns and their English listening comprehension ability. The sample of the study included 30 staff at an IT company. The data obtained from the word stress pattern test were analysed by mean and standard deviation to identify the most problematic patterns. The scores obtained from the word stress pattern test and the scores obtained from the listening comprehension test were analysed by Pearson's Product Moment. The findings indicated the top five highest frequencies for word stress patterns of English words in IT documents which are correctly identified by IT staff and the problematic word stress patterns. In addition, this study illustrated the relationship between the ability to identify word stress patterns and English listening comprehension ability. The findings showed that there was a low positive correlation between ability to identify stress patterns and listening comprehension ability. Although a low correlation was reported, it was positive. This relationship can raise the staff's awareness regarding the importance of pronunciation which is related to listening ability.

Keywords: English word stress patterns, listening comprehension ability, IT documents

Introduction

Background of the Study

English has become the medium of communication in international business (Komin, 1998 as cited in Aungcharoen, 2006) including Thailand. Since Thailand has officially been integrated to ASEAN Economic Community (AEC), English is currently used as an official language for business and communication in workplace (Mihn, 2013). However, the English communication ability of Thai speakers of English was rather limited, compared to that of other ASEAN country members (Bolton, 2008). In line with Bolton's (2008) statement, Thailand Development Research Institute (TDRI) stated that Thai labourers with poor English skills will be at disadvantage because the wages of other countries are cheaper than those of Thailand. Thai labourers whose language skills are poor might be replaced by other ASEAN labourers. In Thailand, oral proficiency in English has been required with increasing number of international companies (Richards and Rodgers 2002 as cited in Aungcharoen, 2006). However, Thai speakers of English still have problems in listening

and speaking skills because they mainly focus on grammar and they are nervous when they communicate with foreigners (Nualsri, 2012). Incorrect English word stress pattern is one of the pronunciation errors that lead to misunderstanding and listening problems. The stress patterns of English word are fixed. Speakers of English are not free to give a prominent stress to any syllables they choose.

Byrnes (1984) also stated that listening is a complex skill in which people have to employ all types of knowledge to interpret the meaning. She explained that listening is more than the perception of sounds. Rather, it includes comprehension of words, phrases, clauses, sentences and connected discourse. Therefore, stress is very important to listening skill since it can facilitate communication. If incorrect stress patterns are pronounced, this can cause misunderstanding.

Since IBM Solutions Delivery Co. Ltd. (IBMSD) is a global company, English is used as a medium to communicate with foreign colleagues and clients. This study aims to investigate the IT staff's ability to identify stress patterns of English words in IT documents and investigate the relationship between the ability to identify word stress patterns and English listening comprehension ability.

Research Questions

1. What word stress patterns of English words in IT documents are correctly identified by IT staff?
2. What word stress patterns of English words in IT documents are incorrectly identified by IT staff?
3. Is there a relationship between the IT staff's ability to identify stress patterns of English words in IT documents and their listening comprehension ability?

Hypothesis

There is a relationship between the IT staff's ability to identify stress patterns of English words in IT documents and their listening comprehension ability.

Statistical hypothesis

H0: $r_{\text{stress.listening}} = 0$

H1: $r_{\text{stress.listening}} \neq 0$

Definitions of terms

1. *IT documents* refers to Operation Performances Meeting (OPM) reports that summarize the overall service performance including follow up and discussion topics.
2. *Identify stress pattern* refers to underline stressed syllable and then pronounce the words included in the stress pattern test.
3. *Word stress patterns* are concerned with stress placement of individual word of two or more syllables when they are pronounced in isolation.
4. *Listening comprehension ability* refers to listening scores obtained from the listening comprehension test.

Literature Review

Word Stress Patterns

Word stress patterns in English are variable. Some words are stressed on the first syllable (e.g. brother, honey, Arab) while other words are stressed on the second, third or fourth syllable. To say the word, each syllable is pronounced with different forces and strengths. That is, one syllable is said louder and longer than other syllables of the same word. The syllable which is pronounced with force is called stressed syllable or accented syllable. Since English has the rules for word stress patterns, it is necessary for ESL learners

to learn how to use correct word stress when speaking. The incorrect word stress can sound unnatural and even cause misunderstanding in communication. In this study, 13 rules of stress patterns suggested by the School of Languages, Kalinga Institute of Industrial Technology (2008-2009) were applied as the main theoretical framework of the study.

1. Two-Syllable nouns and adjectives: the first syllable takes on the stress e.g. SAM-ples, CAR-ton.
2. Two-syllable verbs and prepositions: the stress is on the second syllable e.g. re-LAX, re-CEIVE.
3. Three-syllable words: stress at the word ending (the suffix).
 - 3.1 Words ending in er, or, ly: the stress is placed on the first syllable e.g. di-Rect/ DI-rec-tor
 - 3.2 Words ending in consonants and in y: the first syllable gets the stress e.g. RA-ri-ty, OP-ti-mal.
4. Words with various endings: the stress is going to come on the syllable right before the suffix. This applies to words of all syllable lengths e.g. able: ADDable ery: Bakery ible: resistible ian: comedian ial: differential.
5. Words ending in ee, ese, ique, ette: the primary stress is placed on the suffix. This applies to words of all syllable lengths e.g. ee: aGREE ese: SiamESE.
6. Prefixes: prefixes do not take the stress of a word. There are a few exceptions to this rule, however, like: un, in, pre, ex and mis, which are all stressed in their prefix e.g. ex: e-XAM-ple in: In-Side, In-efficient mis: MIS-spoke.
7. Stress on the second from the end syllable: put stress on the second syllable from the end of the word, with words ending in ic, sion and tion e.g. i-CON-ic.
8. Stress on the third from end syllable: put stress on the third from end syllable with words that end in cy, ty, phy, gy and al e.g. de-MO-cra-cy.
9. Word stress for compound words
 - 9.1 Compound noun: the first word usually takes on the stress e.g. SEA-food, ICE-land.
 - 9.2 Noun + compound nouns: the stress is on the first word e.g. AIR-plane mechanic, PRO-ject manager.
 - 9.3 Compound adjectives: the stress is placed within the second word e.g. ten-ME-ter, rock-SO-lid.
 - 9.4 Compound verbs: the stress is on the second or on the last part e.g. Dogs love to eat bones and love to DRINK water.
10. Phrasal verbs: the second word gets the stress (the preposition) e.g. Black OUT
11. Proper nouns: proper nouns are specific names of people, places or things. The second word is always the one that takes the stress e.g. North DAKOTA.
12. Reflexive pronouns: words which show that the action affects the person who performs the action. The second syllable usually takes the stress e.g. my-SELF.
13. Numbers: if the number is a multiple of ten, the stress is placed on the first syllable e.g. TEN, FIF-ty.

The participants of this study were then tested if they can identify the words correctly according to these 13 rules.

Previous Studies

The previous studies which were related stress patterns were reviewed and summarized below.

Studies Relevant to Stress and English Proficiency

Demirezen (2016) conducted a study to investigate the perception of tonic stress placement in English words with the first year students in the English language Education Department in Turkey. The results indicate that the ability of nuclear stress perception in vocabulary items can be beneficial in learning listening comprehension.

Aungcharoen (2006) investigated the English word stress perception and production skills of Thai 12th grade students. The results illustrated that there was a positive relationship between the students' word stress perception and production skills. The results also indicated that the students with high proficiency in English had better skills in word stress perception and production than the students with low proficiency in English.

Studies Related to Teaching Stress

Pierrel (2010) developed the materials for teaching word stress in English. The word stress was the focus of this study since it can cause problem for learners of English. The findings illustrated that the developed materials can be used with advanced learners of English who wanted to improve their pronunciation and their oral comprehension.

Chu (2012) investigated the acquisition of English word stress by ESL learners in Hong Kong and assessment of an online Tutoring Programme. The findings show that the practice with the developed programme was beneficial to those students who began the course with a strong foreign accent, but it was of limited value to students who began the course with better pronunciation.

To summarize, the studies show that stress can be trained. Those who get the stress training can improve their ability to stress words and can have better pronunciation.

Studies about the stress in English and L1

Ma and Tan (2015) compared the word stress patterns and functions between English and Sichuan dialect. The findings illustrate the similarities and differences between English and Sichuan stress patterns. Hence, the findings can be helpful to students in dialect area in learning English pronunciation and help them avoid misplacing word stress in communication.

It can be concluded that English stress patterns are complex and irregular. The pronunciation in L1 can affect English pronunciation. Learning similarities and differences between English stress patterns and L1 stress patterns can be useful the pronunciation training.

Research Methodology

Research Design

This study focuses on the relationship between the IT staff's ability to identify word stress patterns of English words in IT documents and their English listening comprehension ability. The study approach is correlational research.

Participants

The participants in this study were 30 IT staff who worked in different positions at IBMSD head office, a technology company in Bangkok, Thailand. The purposive sampling technique was employed.

Instrumentation

The instruments used in this study are as follows:

Word stress pattern test. A list of English words in IT documents consists of 28 words. These words which contained 2, 3 and 4 syllables were randomly selected from IT documents.

Listening comprehension test. Twenty eight words from the word stress pattern test were used to create the listening comprehension test. The listening test was considered if they possess the expected characteristics of listening tasks at a company. The test includes 3 listening tasks: 1) How to reset an intranet password, 2) A manager's briefing the specification of a required computer and 3) Understanding customer' requirements. There were 10 questions in each part. Therefore, the total number of the listening test items is 30.

Research procedures

The research was developed through 3 main phases as follows:

Phase1: The Development of Word Stress Pattern test

1. Study the Operation Performances Meeting (OPM) reports commonly used by IT staff.

2. Study the stress pattern rules of words. There are 13 rules of word stress patterns recommended by School of Languages, Kalinga Institute of Industrial Technology (2008-2009).

3. To create the wordlist for the stress pattern test, the researcher selected words frequently found in IT documents by considering these 2 aspects: 1) Commonly used words and 2) Tentatively problematic stress patterns.

Then, the researcher grouped the words according to 13 rules of stress patterns and selected words from these rules again. The number of words selected from the rules was 70 words.

4. After that, 3 IT staff were asked to evaluate if the selected words were frequently found in IT documents by using Item Objective Congruence Form (IOC) (See Appendix 1: Wordlist-Words frequently found in IT documents for IT staff).

5. After the revision of the wordlist, IOC form for experts was developed (See Appendix 2: Wordlist-Words frequently found in IT documents for IT experts).

6. The words were accepted if the IOC index was equal to or higher than 0.5 (Brown, 2004).

7. Finally, 28 words from 13 rules of word stress patterns were included in the word stress pattern test (See Appendix 3: Word Stress Pattern Test).

Phase 2. The Development of Listening Comprehension Test

The listening comprehension test was developed according to the following steps:

1. 28 words from the word stress pattern test were used to create the listening comprehension test. The item type used for this listening test was multiple choices.

2. The domain specifications developed for the listening comprehension test was based on the six major categories of the cognitive domain derived from the Revised Bloom's Taxonomy (Bloom cited in Wilson, 2016).

3. The test specification was developed by employing the IT workplace tasks and the levels of ability proposed by Revised Bloom's Taxonomy (Bloom cited in Wilson, 2016).

4. Write 30 items according to the developed test specification.

5. Three English teachers were asked to evaluate and rate the congruence of the written test items and the test specification by using IOC (See Appendix 4: IOC for Listening Comprehension Test).

6. Then, the listening passages were read by a native speaker. Due to the fact that there were foreign staff with various nationalities in the workplace, having audio records with a native speaker's accent for the listening test can reduce the bias of different English accents.

7. The online listening test was created by Google Forms. Finally, the listening comprehension test was developed.

Phase 3. Implementation of the Study

1. The participants took the word stress pattern test. They were required to 1) underline stress patterns and 2) pronounce the words while they were taking the test. The researcher recoded their voices to recheck if the underlined stress patterns and the pronunciation were congruent.

2. Then the scores were summarized.

3. After that, the sample took the listening comprehension test which was created by Google Forms. They were required to listen and choose the correct answer in each item.

4. The exam papers were marked and the data were analyzed accordingly.

Data collection

The staff were asked to pronounce 28 English words in IT documents presented in the word list. The pronunciation of the participants was recorded while marking the stress positions in the words and then the staff took the listening test.

Data analysis and statistical procedures

The data were analyzed according to the research questions below:

Research question 1: The frequency of correct stress was counted and changed to percent. The formula for changing the frequency into percent is

$$\frac{\text{The frequency of correctly identified patterns} \times 100}{\text{The number of IT staff taking the test}}$$

Research question 2: Similarly, the frequency of incorrect stress was counted and changed to percent. The formula for changing the frequency into percent is

$$\frac{\text{The frequency of incorrectly identified patterns} \times 100}{\text{The number of IT staff taking the test}}$$

Research question 3: The correct stress scores obtained from the word stress pattern test and the scores obtained from the listening comprehension test were analyzed by means of Pearson's correlation.

Findings

The findings of the study are reported according to three research questions:

Research Question 1: The top five highest frequency for word stress patterns of English words in IT documents which are correctly identified by IT company staff as are presented in Table 1.

Table 1

The stress patterns that the staff mostly identified correctly

Word Stress Pattern	Frequency of correct Stress (f)	Percent (%)	Frequency of Incorrect Stress (f)	Percent (%)
RULE 13: Numbers (<u>th</u> irty, <u>fo</u> rt)	28.00	93.33	2.00	6.67
RULE 5: Words ending in ee, ese, ique, ette (<u>techni</u> que, <u>uniqu</u> e)	22.00	73.33	8.00	26.67
RULE1: Two-Syllable nouns and adjectives stress. (<u>net</u> work, <u>soft</u> ware)	20.50	68.33	9.50	31.67
RULE12: Reflexive pronouns (<u>your</u> self, <u>ours</u> elves)	20.00	66.67	10.00	33.33
RULE2: Two syllable verbs and prepositions (<u>up</u> grade, <u>per</u> formed)	19.50	65.00	10.50	35.00

From Table 1, it was found that the first five highest frequencies for word stress patterns correctly identified by IT staff included **1) RULE 13:** Numbers (f=28, 93.33%), **2) RULE 5:** Words ending in ee, ese, ique, ette (f=22, 73.33%), **3) RULE 1:** Two-Syllable nouns and adjectives (f=20.50, 68.33%), **4) RULE 12:** Reflexive pronouns (f=20.00, 66.67%) and **5) RULE 2:** Two syllable verbs and prepositions (f=19.50, 65%).

Research Question 2: To know the problematic stress patterns, the words with the lowest frequencies of correct identification were reordered in Table 2.

Table 2

The stress patterns that the staff mostly identified incorrectly

Word Stress Pattern	Frequency of correct Stress (f)	Percent (%)	Frequency of Incorrect Stress (f)	Percent (%)
RULE 9.2: Noun + compound nouns (<u>email</u> address)	8.00	26.70	22.00	73.30
RULE 10: Phrasal verbs (<u>log in</u> , <u>log out</u>)	8.50	28.33	21.50	71.67

IT STAFF'S ABILITY IDENTIFYING STRESS PATTERNS OF ENGLISH

Word Stress Pattern	Frequency of of correct Stress (f)	Percent (%)	Frequency of Incorrect Stress (f)	Percent (%)
RULE 9.1: Word stress for Compound noun: <u>user</u> password)	11.00	36.70	19.00	63.30
RULE 3.2: Words ending in consonants and in y (<u>memory</u> , <u>frequency</u>)	12.50	41.67	19.85	66.17
RULE 11: Proper nouns (Thinkpad, ITS <u>Thailand</u>)	13.00	43.33	17.00	56.67

Regarding the rules which are incorrectly identified, the rules included **1) Rule 9.2:** Noun + compound nouns (f=8,26.70%), **2) Rule 10:** Phrasal verbs (f=8.50,28.33%), **3) Rule 9.1:** Word stress for compound (f=11,36.70%), **4) Rule 3.2:** Words ending in consonants and in y (f=12.50,41.67%) and **5) Rule 11:** Proper nouns (f=13, 43.33%).

Research Question 3: The findings for this question were used to test Hypothesis 1.

Hypothesis 1: There is a significant relationship between the IT staff's ability to identify stress patterns of English words in IT documents and their listening comprehension ability at the .05 level. (H1: $r \neq 0$).

Table 3

The correlation coefficients between the IT staff's ability to correctly identify word stress patterns of English words in IT documents and their listening comprehension ability.

	stress	listening
Stress Pearson Correlation	1	.266
Sig. (2-tailed)		.156
N	30	30

The findings from Table 3 showed that the correlation coefficient between the mean score of ability to correctly identify word stress patterns and the mean score of listening comprehension ability is .266. This coefficient value is considered as weak or low correlation (Wilson, 2009).

From the above, it can be said that the staff's ability to identify stress patterns has the low positive correlation with listening comprehension ability. If the staff know word stress patterns, it will help them understand the listening. However, the low correlation means it does not have any effects on the staff's listening comprehension ability.

Conclusion, Discussion and Recommendations

The conclusion and discussions from the findings of the study are presented as follows:

1. For the findings from the research question 1 which asked about what word stress patterns of English words in IT documents are correctly identified by IT company staff, it

illustrated that one of the stress patterns the staff mostly identified correctly was **Rule 13**: numbers. This can be explained by the familiarity of words. Since most of IT jobs are required to deal with numbers, they are familiar to the use of numbers both oral and written forms. When hearing numbers in English, they can recognize the words for numbers with ease.

The next rules that IT staff correctly identified are **Rule 5**, **Rule 1**, **Rule 12** and **Rule 2**. The words in these rules are content words which are used to express cultural contents carrying descriptive meaning. They consists of nouns, verbs, adjectives, and adverbs.

These findings are similar to the findings obtained from Garton and Allen's study (2007) which examined word recognition for physics and non-physics students after a single visual presentation of a series of sixty words. It is suggested that the correct identification of words is likely to be made when the meaning of all the words is known. That is to say, when students frequently use the words, they will be able to recognize the words when listening or reading.

2. For the findings from the research question 2, regarding the problematic stress patterns, the words with the lowest frequencies of correct identification were **Rule 9.2**, **Rule 10**, **Rule 9.1**, **Rule 3.2** and **Rule 11**. These findings can be explained by the influence of the mother tongue or L1. Since English stress patterns are complex and irregular, the pronunciation in L1 can affect English pronunciation (Ma and Tan, 2015, and Kang, Baek, Yim, 2008). Learning similarities and differences between English stress patterns and L1 stress patterns can be useful for the pronunciation training.

3. For the findings from the research question 3, the findings showed that there was a low positive correlation with listening comprehension ability. Although a low correlation was reported but it was positive. That is to say if staff know word stress patterns, it will help them understand the listening. Similarly, Demirezen's study (2016) indicated that the ability of stress perception in vocabulary items can be beneficial in learning listening comprehension. In addition, Aungcharoen (2006) summarized that there was a positive relationship between English stress and English proficiency. Students with high proficiency in English had better skills in word stress perception and production than the students with low proficiency in English.

Recommendations

1. The findings of this study can be a guideline for designing the training course for Thai staff who have to deal with foreign colleagues and clients.

2. The findings encourage students and those who use English at workplace to be aware of the importance of pronunciation to improve their speaking and listening skills in English.

3. Stress is only one aspects of pronunciation. Other aspects such as consonant and vowel sounds can be a focus of the further studies.

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Appendix 1: IOC Form

Wordlist- Words frequently found in IT documents for IT staff

Main Objective: The purpose of this wordlist is to recheck if the words are frequently found in IT documents which are used by staff in an IT company.

Instructions: Please tick (✓) in the rating box according to your opinions and specify comments or suggestions for the words frequently found in IT documents. Rate the items with the investigating points according to this

Yes = Agree that the word is frequently found in IT documents

Maybe = Not certain if the word is frequently found in IT documents

No = Disagree that the word is frequently found in IT documents

Remark: If you put a tick at “No” box, please specify a new word with the same stress pattern in the “Comments” box.

Words				Comments
	Yes	Maybe	No	
1. Two-Syllable nouns and adjectives: the first syllable takes on the stress.				
project				
network				
software				
active				
complete				

Appendix 2: IOC Form

Wordlist-Words frequently found in IT documents for IT experts

Instructions: Choose only two words from wordlist each rule. Please tick (✓) in the box according to your opinions and specify comments or suggestions for the words frequently found in IT documents.

Remark: Please specify a new word with the same stress pattern in the “Comments” box if you are not satisfied with the words given in each rule.

Words	Choose only two words from wordlist each rule.	Comments
1. Two-Syllable nouns and adjectives: the first syllable takes on the stress.		
project		
network		
software		
active		
useful		

Appendix 3: Word Stress Pattern test

A list of English words in IT documents consists of 28 words. These words which contained 2, 3 and 4 syllables were selected and randomly selected from IT documents.

Instructions: The sample takes the word stress pattern test. You will be required to 1) underline stress patterns and 2) pronounce the words while you are taking the test. The researcher will recode their voices.

1. Programmer
2. unique
3. technology
4. application

Appendix 4: IOC Form**Listening Comprehension Test**

Main Objective: The purpose of this listening comprehension test is to find out the staff's listening comprehension ability. This IOC is used for evaluating the validity of the listening passages and listening test items. 1) For evaluating listening passages, the listening passages will be considered if they possess the expected characteristics of listening tasks at a company. 2) For evaluating listening test items, the written items will be validated if they can measure the expected ability levels.

Scheme for evaluating listening items: six categories of the cognitive domain (Bloom cited in Wilson, 2016) can be listed in order below, starting from the simplest behavior to the most complex. The categories can be thought of as degrees of difficulties. That is, the first one must be mastered before the next one can take place.

Instructions: Please tick (✓) in the rating box according to your opinions and specify Rate

Category	Key Words
Remembering: Recalling information	Recognizing, listing, describing, retrieving, naming, finding
Understanding: Explaining ideas or concepts	Interpreting, summarizing, paraphrasing, classifying, explaining
Applying: Using information in another familiar situation	Implementing, carrying out, using, executing
Analyzing: Breaking information into parts to explore understandings and relationships	Comparing, organizing, deconstructing, interrogating, finding
Evaluating: Justifying a decision or course of action	Checking, hypothesizing, critiquing, experimenting, judging
Creating: Generating new ideas, products, or ways of viewing things	Designing, constructing, planning, producing, inventing

the congruence between the items with the investigating points.

H = High degree of congruence M = Moderate degree of congruence

L = Low degree of congruence

Listening passage for part 1: Good morning, I'm Richa from the help desk team. Today I'm going to talk about intranet passwords. These days, a lot of staff are facing the problem of the intranet passwords which expire shortly after set up and have to be reset often. On average, there are about forty staff who report this problem every month.

Please put a ✓ in the box corresponding to your opinions (provide your comment, if any).

Expected Characteristic	Does the listening passage possess the expected characteristic?			
	Yes	No	Maybe	Comment
Task purpose: To understand the content of presentation topic				
Test content: To listen to help desk team presentation about how to reset an intranet password				

1. What is the presenter's name?

A. Richa B. Richard C. Chacha D. Marsha

IT STAFF'S ABILITY IDENTIFYING STRESS PATTERNS OF ENGLISH

Item	Listening Ability	Does the item measure the expected ability?			
		H	M	L	comment
Question 1	Revised Bloom's Taxonomy : Level 1 Remembering: Recalling information				