The Effects of the Thai Phonological and Writing Systems on Spelling and Writing in English: A Case Study of Burapha University Students

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Abstract

Thai has unique phonological structures, which are very different from those of English. The very fact that there are more consonant phonemes in English than Thai has created problems for Thai learners of EFL in accommodating and pronouncing English consonant sounds. The differences in the writing systems of the two languages is also considered problematic for them. It is the hypothesis of this study that these two issues contribute to and affect the spelling and writing of English in Thai learners. Experimental tests of the hypothesis were administered. To achieve this, 89 students who took a TOEIC intensive course and had TOEIC pre-test scores lower than 40 per cent were chosen to participate in the study. They were assigned three tasks: 1) auditory/ visual word matching; 2) a spelling words test from dictation; and 3) a short essay. Misspellings occurring in the tasks were classified in accordance with the target modification taxonomy. Each category of errors was further sub-classified, using a method adapted from Rimrott's (2004) CLASSY: Competence/ Performance, Linguistics Subsystem, and Language Influence. Both the student participants who obtained similar marks, constituting the majority, and the teacher participants who read words out to the student participants were invited to take part in an in-depth, unstructured interview. It was found that spelling errors were particularly noticeable in Task 2, whilst the students performed better in Task 1, and best in Task 3, as they opted to write words they were familiar with. Distribution of errors across the competence/ performance taxonomy was mutually exclusive. Orthographic and morphological errors were found only under performance errors, whilst only phonological and lexical errors appeared under competence misspellings, so the errors were found to be in complementary distribution. Since the phonological errors formed part of the competence taxonomy, it follows that the spelling errors of those participants were based on interlingual influence of L1 phonological knowledge. It was therefore concluded that the Thai phonological system did affect the spelling and writing in English for this study. The Thai writing system, on the other hand, did not have any significant effect on the spelling and writing in English. Instead, it was the writing system of English with which the participants struggled. This, therefore, supported the hypothesis in part. There was ample evidence in the interviews of another striking issue affecting the spelling and writing of the learners, i.e. the affective factor, which appears to have played a vital role in the accuracy of spelling and writing as well as pronunciation in English.

Introduction

Different languages have their own unique phonological structures which contrast with those of other languages, and which create problems in accommodating and pronouncing English sounds. This eventually results in ambiguity and miscommunication (e.g. 'tin' vs. 'thin') due to conflicting sound distinctions. Given that some English phonemes are absent in the Thai phonological system, it is inevitable that Thai learners have considerable difficulty uttering these phonemes. The ultimate cause is the fact that few English teachers are sufficiently trained in English phonetics, and even fewer in contrastive phonology, so that it is difficult for them to understand adequately the problems their students are struggling with; and that textbooks, especially those written by Thai authors, fail to address these problems in sufficient detail.

Another major issue with regard to the writing systems of the two languages is that the English writing system uses Roman script, with much irregularity of grapheme-phoneme correspondence, whereas the Thai writing system uses non-Roman script and has a more rule-governed grapheme-phoneme correspondence. The differences between the two systems possibly affect the Thai learners' conscious knowledge of the English grapheme-phoneme correspondence.

The two aforementioned issues contribute to the hypothesis of this study. It is predicted that native speakers of Thai will find it difficult to spell and write English words, given the differences between the phonological and writing systems of the two languages.

The Thai and English Systems: A Comparative Examination

Certain aspects of the differences between the two systems are obvious. In terms of the phonological system,[1] English contains 24 consonant phonemes, whilst Thai has 20, as can be seen from Table 1, adapted from Kanokpermpoon (2007).

[1] Only consonant phonemes are discussed in this study, and although I recognise that vowel phonemes also form part of the Thai phonological system, they are beyond the scope of the study.

Table 1: *Thai consonant sounds*

	Bilabial	**Labiodental**	**Alveolar**	**Post-Alveolar**	**Palatal**	**Velar**	**Glottal**
Plosive	p b p^h		t d t^h			k k^h	ʔ
Nasal	m		n			ŋ	
Trill			r				
Fricative		f	s				h
Affricate				c c^h			
Approximant					y		
Lateral approximant	w		l				

Table 2: *English consonant sounds*

	Bilabial	**Labiodental**	**Dental**	**Alveolar**	**Post-Alveolar**	**Palatal**	**Velar**	**Glottal**
Plosive	p b			t d			k g	
Nasal	m			n			ŋ	
Fricative		f v	θ ð	s z	ʃ ʒ			h
Affricate					tʃ dʒ			
Lateral				l				
Approximant				ɹ		j	w	

These consonant phonemes contrast in syllable-initial position in Thai, as do those in English. In terms of voicing for plosives (stops), English appears to be similar to Thai, e.g. as seen in bilabial /p/ and /b/, where voicing quality, i.e. whether the sound is voiced/voiceless, carries a change in meaning. The three-way voicing/ aspiration contrast in bilabial /p p^h b/ and alveolar / t d t^h/ is, according to Harris (2001), a notable feature of Thai, which is absent in English. In Thai, then, one phoneme can be further segmented into two different, yet *relatively similar*, sounds by the addition of aspiration, resulting in a change in meaning. It appears that English does have more *distinctive* phonemes to acquire than does Thai, and leads to the question whether or not Thai learners have difficulty pronouncing English consonant sounds.

In terms of manner of articulation, the major difference lies in the fricatives, of which Thai has a smaller number than English. Even more strikingly, the Thai affricates are entirely different from those of English. That being said, the nasals of the two languages show similarity in pronunciation. In Thai, voiced nasal stops occur at the bilabial /m/, alveolar /n/, and velar /ŋ/ places of articulation, and the same is true of English. Alveolar articulations in Thai also include trill /r/, which is absent in English, and lateral approximant /l/.

In relation to the place of articulation, the two languages observe seven phonemes at the alveolar place. In Thai, there are three oral stops, a voiced nasal stop, a voiced trill, a voiceless fricative, and a voiced lateral approximant. Palatal /y/ and labial-velar /w/ approximants are also included in the Thai consonant inventory. However, Thai has fewer voiced consonant phonemes than English. Furthermore, one place of articulation which is present in English but absent in Thai is dental. No Thai phonemes are articulated using particular active articulators which are the tongue, the lower and upper teeth.

So far, the phonological systems of Thai and English have revealed both similarities and differences. When certain consonant phonemes are present in both languages, they do not cause any difficulty for Thai learners to pronounce accurately. On the other hand, when consonant phonemes, i.e. certain English consonant phonemes, are absent in Thai, this causes pronunciation problems for Thai learners of English.

With regard to interaction between the writing system and the phonological system,[2] Thai and English appear to be both similar and different in a number of ways. To start with, although Thai and English are both alphabetic, the two languages are not exactly similar. Thai uses a syllabic alphabet, e.g. <ท> is transcribed as [tʰɔɔtháhăan] with the inherent vowel /ɔ/ attached to it, but English uses a phonotypic alphabet. That is, English has a sound-based 'phonographic' writing system, connecting graphemes with the sounds of speech. According to Cook & Bassetti (2005), English is an alphabetically sound-based writing system, as its script represents all the phonemes of speech, both consonant and vowel phonemes. Languages like Arabic and Hebrew, of which the writing systems represent only spoken consonants, are therefore classified as having a consonantal system. As for Thai, Coulmas (2006) contends that its writing system appears to be more similar to that of English, in the sense that it has irregular spelling and polyvalent grapheme-phoneme correspondences. For instance, in Thai some phonemes have multiple grapheme representation, e.g. <ฑ>, <ท>, <ฒ> and <ธ> represent the same phoneme /t/. In English some letters represent more than one phoneme, e.g. <s> represents the phonemes /s/ as in <sound>; /z/ as in <rose>; /ʃ/ as in <sugar> and /ʒ/ as in <usually>. Despite the similarity, English appears more difficult than Thai with regard to grapheme-phoneme correspondences, since such polyvalence lies in the abstract phonological level, but that of Thai appear at the concrete grapheme level. Nonetheless, both Thai and English systems reveal a systematic mapping between graphemes (signs) and phonemes (the minimal units of speech). For instance, in relation to a grapheme, the English writing system segments language into phonemes, represented by letters or letter combinations. For instance, <b> as in <bee> represents /b/, <ch> as in <church> represents /tʃ/. Similarly, Thai graphemes represent phonemes, e.g. the grapheme <ร> represents the phoneme /r/.

The orthographies of the two languages diverge markedly from each other. English uses a set of orthographic rules for the script, e.g. symbol-sound correspondences, capitalisation, hyphenation, punctuation, and the like. On the other hand, Thai has a limited number of such markers, i.e. Thai merely uses quotation marks to signal a quotation or the words someone speaks. Furthermore, the string of words are joined

[2] In this study, the writing system is viewed in the sense of *scripts* and *orthography*, i.e. an interaction between the graphic form of the units of a writing system (Coulmas 2006) and the set of rules used in a particular language for spelling, punctuation, etc.

and run together without any marker to signal word boundaries. To indicate a complete thought in a well-formed phrase or sentence or an incomplete one, a space is used. In some cases, however, a space does not necessarily indicate a sentence break. For these reasons, English appears more straightforward, in that spacing separates words and hyphenation or punctuation helps make English writing easier to read.

The fact that both Thai and English are alphabetic does not mean that they are similar in the regularity of their correspondence rules. English is not phonologically transparent, but rather a phonologically opaque writing system, according to Cook & Bassetti (2005). The letter-to-sound and sound-to-letter correspondences are not quite one-to-one in English. An illustration of this is the English letter <c>, which corresponds to at least three phonemes: /s/ as in 'cease'; /k/ as in 'cataclysm' ; and /tʃ/ as in 'cello'. The letters <oo> correspond to at least five vowel phonemes: /u/ as in 'boot', /ʊ/ as in 'book', /ʌ/ as in 'blood', /əʊ/ as in 'brooch', and /ɔ/ as in 'door'. On the other hand, the Thai system is more phonologically transparent; for instance <มาก> corresponds to /maak/ letter by letter, and <ม> and <ก> always correspond to the same phonemes: /m/ and /k/ respectively.

In terms of orthographic constraints, both Thai and English reveal some limitations as to how the graphemes are combined with other graphemes. To illustrate, in English certain combinations are possible in word-initial position: the first segment of such a position (*onset*, to use a phonological term) allows a stop or a fricative, whilst the second (branching onset) needs to be one of the following: /ɹ/, /l/ or /w/, and /j/. Possible combinations of these, for instance, would be /pɹ/, /bl/, /dw/, /ɵw/, /sl/, and /fɹ/, but not /*tl/, /*dð/ or /*dz/ (these combinations would sound foreign to native English-speakers). Another example might be that the English <spr> and <scr> must occur in word-initial position, as in 'spray' and 'scram'. Cook & Bassetti (2005) draw another instance, of the English <tch>, which can only appear word-finally (as in 'match'); English <o> can double as in 'boo', but <a> cannot. Interestingly, evidence from recent research by Kessler & Treiman (2002) has shown that in English coronal onsets prefer non-coronal codas, and vice versa. In English the coda allows most of the consonant phonemes.

In Thai, the branching onsets display a similar pattern to that of English. The first segment, however, allows a more generous option for combination with a lateral or approximant. That is, any consonant can occupy the onset, and may be followed by /ɹ/, /l/ or /w/, or /j/, thereby becoming a branching onset. Nonetheless, the branching onset merely allows a monophthong, contra English. Furthermore, the coda allows only limited phonemes, namely /p/, /t/, /k/, /m/, /n/, /ŋ/, /j/, and /w/. As has been seen, Thai and English show constraints on orthography due to language-specific phonotactics, and this is predicted to affect the productive skills of the participants in the study.

Method

There were three types of experimental task administered in the study. The first task, adopted from Cook (1994), required the participants to listen to 30 English words

embedded in noun phrases or short sentences uttered by a teacher. The participants were provided with three possible spellings for each word and asked to choose the one which they thought was correct, based on what they had heard. What was assessed and examined in the task was emergent spelling in English and the participants' knowledge of phonological and orthographic elements and word patterns in familiar English words.

Second, the participants were asked to complete a word-spelling test from dictation (Okada, 2002; Van Berkel, 2005). The text contained 49 words. The second task was similar to the first, except that the students were asked to use phoneme-grapheme correspondence based solely on their judgement, without any choices or distracters. To achieve this task, the teachers were given a list of words, and pronounced each word twice, in isolation, to the participants. The participants were given time to finish one item, i.e. spelling a word, before the next was presented. They were encouraged to attempt all the words presented, even if they were not certain of the spelling or meaning.

For the third task, participants were asked to compose a short free essay so that naturally occurring material and errors could be collected (Cook, 1997; Cook, 2004), as well as to control for orthographic and phonological complexity. Note that Tasks 1 and 3 were untimed.

Data collection and procedures

After taking the TOEIC pre-test, participants were asked to complete the three tasks in approximately one hour. All the test materials were administered to a total of three different groups (two groups from the Faculty of Management and Tourism, and the third from the Faculty of Logistics) at the end of their first class of the TOEIC intensive preparation course in Terms 1 and 2 of Academic Year 2012. The testing was administered in a quiet, comfortable room in the Faculty of Humanities and Social Sciences, BUU, QS_2 Building. A series of tasks, described above, assessed phonological awareness, spelling, and the creation of real English words. All participants received the tasks in the same order. Every task was subsequently marked, and the percentage of incorrect items was calculated for the analysis. In addition, in order to triangulate the data and add to its truthfulness and richness, data was gained through informal interviews, administered separately from the tests.

Each student participant who obtained similar marks, which constituted the majority, was selected to have an in-depth, unstructured interview. The interview lasted between 30 and 45 minutes, and was conducted in Thai. The interviews had a broad focus on the participants' educational experiences as learners within their social contexts, and a list of topic areas was used as a framework for discussion. In addition, two teacher participants in the study, who had read the words out to the groups of students, were asked to have an in-depth, unstructured interview, which lasted around 30 minutes. The purpose of the unstructured interviews was not only to consolidate the reliability of the data gained, but also to test the working hypothesis by opening a window of understanding onto how these participants as students and teachers acquired the writing and phonological systems of English.

Data analysis

After the test had been administered, the incorrect answers from the tasks together with data from Task 3 were categorised according to spelling error classification, based on the target modification taxonomy, i.e. letter insertion, deletion, substitution, and transposition. Upon completion, the results were quantitatively analysed, showing descriptive statistics. Next, each category of errors was further classified, using a method adapted from Rimrott's (2004) CLASSY. Whether misspellings are assigned under performance or competence depends a great deal on the nature of the task. Furthermore, Dulay et al.'s (1982) criterion was adopted. That is, each misspelling of a particular target word was categorised as a competence error if the target word was misspelled at least two times, by at least four participants, or by at least two participants four or more times. These frequency rules were applied to whole words and to morphemes/ graphemes within a misspelling. Decision Trees for the Linguistic Sub-system Sub-taxonomy and for the Language Influence Sub-taxonomy were used for misspelling assignment. The data gained from the interviews with the student and teacher participants were studied and achieved through a descriptive analysis, concentrating on the main aspects, i.e. the interaction between the Thai and English phonological and writing systems, and the psychological aspects of the participants.

Results

The quantitative differences between the three groups with regard to spelling errors are shown in Table 3. The average total number of errors per group is as follows:

Table 3: *Quantitative differences in relation to misspellings gathered from the tasks*

	Task 1		Task 2		Task 3	
	Target words	Frequency & P of misspellings	Target words	Frequency & P of misspellings	Total of tokens	Frequency & P of misspellings
Group 1	30	160 (41.04%)	49	367 (57.61%)	158	5 (3.16%)
Group 2		409 (38.97%)		911 (53.12%)	533	16 (2.81%)
Group 3		438 (35.61%)		969 (48.23%)	1510	14 (0.93%)

Note: Task 1 = auditory/ visual word matching; Task 2 = spelling words from dictation;
Task 3 = short essays

The results were not surprising: the spelling errors were particularly salient in Task 2, in which participants were required to do spelling from dictation, whilst they performed better in Task 1, in which multiple choices associated with the words they heard were provided. They performed best in Task 3; based on the words generated, only a few spelling errors were detected, as they opted to write words they were

familiar with. The following table illustrates error distribution according to target modification of all misspellings.

Table 4: *Error distribution*

		Task 1		Task 2		Task 3	
	Error type	Frequency	P	Frequency	P	Frequency	P
G 1	Substitution	85	53.13%	280	76.29%	3	50.00%
	Deletion	27	16.88%	23	6.27%	1	16.67%
	Insertion	10	6.25%	25	6.81%	1	16.67%
	Transposition	38	23.75%	18	4.90%	1	16.67%
	Omission	n/a		21	5.72%	n/a	
G 2	Substitution	241	59.17%	662	72.67%	7	43.75%
	Deletion	60	14.67%	83	9.11%	7	43.75%
	Insertion	30	7.33%	73	8.01%	0	0.00%
	Transposition	77	18.83%	29	3.18%	2	12.50%
	Omission	n/a		64	7.03%	n/a	
G 3	Substitution	225	51.37%	680	70.18%	8	44.44%
	Deletion	90	20.55%	116	11.97%	6	33.33%
	Insertion	26	5.94%	49	5.06%	3	16.67%
	Transposition	97	22.15%	38	3.92%	1	5.56%
	Omission	n/a		86	8.88%	n/a	

Even though there was a quantitative difference between the participant groups, there was a significant similarity with regard to the proportion of major misspellings. That is to say, the substitution errors outnumbered other categories of errors in all test types across the three groups of participants. On the one hand, transposition errors (found to be the second most frequent) were restricted to the multiple-choice spelling test, and this was true of all the participant groups. On the other hand, the proportion of transposition errors found in all groups was relatively low in the dictation task. Meanwhile, the proportion of deletion errors remained stable across the groups in Task 1, but fluctuated quite considerably in the other tasks. In Task 2 there were some omissions, where participants deliberately omitted to spell the words either because of a reluctance or inability to spell them or even because of the time constraint. In Task 3, the words generated in the essays were found to be frequently used or familiar to the participants, and other low-frequency words were ignored. Despite the familiarity of the words chosen, some misspellings were revealed, in which case they were analysed as typing errors, i.e. performance errors, unlike the misspellings found in the other tasks.

Discussion

The main findings so far have shown clearly that the task type determined misspelling rates. The percentage rate of misspellings in accordance with task type is in ascending order: 68.21 (spelling words from dictation), 30.57 (auditory/ visual word matching), and 1.21 (short essays). The results from the short essay task indicated that the spelling errors were simply random mistakes, where almost all of the target words were misspelled only once, by one participant per item. The misspellings under Task 3 were thus performance-based. This is illustrated in the following table.

Table 5: *Instances of spelling errors under Orthographic and Morphological Sub-Taxonomies taken from Task 3*

Word	**Error**	**Linguistic Sub-taxonomy**	
		orthographic	***morphological***
Faculty of Humanities	*faculty of Humanities	✔	
I	*i	✔	
Internet	*internet	✔	
Bangkok	*bangkok	✔	
Oasis	*oasis	✔	
Blackhead	*blackhead	✔	
Ratchaburi	*Rachaburi	✔	
Fish/ fishes	*fishs		✔
When I'm free, I…	*When I'm free I	✔	
Central Chon Buri	*central chon buri	✔	
Every week	*everyweek	✔	
Twitter	*twitter	✔	
Koh Samui	*koh-samui	✔	
Watching	*watchig		✔
Everywhere	*every where	✔	
I'm	*I' am	✔	
Skype	*skype	✔	
I read a book every day.	I read a book *everyday.	✔	
Listening	*listenning		✔
Windsurf	*wind-surf	✔	

Table 6: *Instances of spelling errors at syllable-initial position*

English phoneme	**Grapheme adaptation**	**Resulting spelling**	**Linguistic Sub-taxonomy**	
			Phonological	**Lexical**
/z/ acquisition	<c>	*acquicition	✔	
/v/ van	<f>	*fan	✔	
	<ph>	*phan	✔	
/g/ gorgeous	<c>	*corderd	✔	
	<k>	*kojean	✔	
	<j>	*jealous		✔

/dʒ/ gorgeous	<j>	*gortj	✔		
	<d>	*goddess			✔
		*draw giant			✔
	<s>	*gorgeses	✔		
/dʒ/ ginger	<j>	*jinger/jing jo	✔		
	<t>	*gineture	✔		
	<f>	*feature			✔
/dʒ/ jar	<d>	*draw/ dare/ dry			✔
		*dray/ da	✔		
	<y>	*yar	✔		
/dʒ/ gene	<j>	*jean	✔		
		*jeans			✔
/dʒ/ judge	<d>	*dust/ duck			✔
		*dutch	✔		
/tʃ/ chin	<t>,	*tin	✔		
	<th>	*thin	✔		
	<sh>	*shin	✔		
/tʃ/ nature	<j>	*major			✔
		*najor	✔		
	<th>	*nather	✔		
		*neither			✔
/tʃ/ church	<sh>	*shirt			✔
	<t>	*tourt	✔		
	<th>	*thouch	✔		
		*thirth	✔		
/ʒ/ leisure	<t>	*lecture/ later			✔
		*leture/ letture	✔		
	<y>	*layer			✔
	<th>	*leather			✔
	<ch>	*leacher/ letcher	✔		
	<g>	*lagger	✔		
/ʒ/ occasion	<t>	*occation	✔		
/ʒ/ vision	<g>	*vigion *vition	✔		
	<t>	*wished	✔		
	<sh>				✔
/l/ leisure	<r>	*reture		✔	
/ɹ/ real	<l>	*leal	✔		
/t/ tin	<th>	*thin	✔		
/θ/ thin	<t>	*tin	✔		
	<f>	*fin	✔		
	<s>	*sin	✔		
		*since			✔
/θ/ three	<t>	*tree	✔		
/ð/ this	<d>	*dis		✔	
		*dish/ didn't/			✔
	<b>	deep	✔		

		*bizz			
/ð/ either	<t>	*eter		✔	
	<g>	*eger	✔		
/ð/ then	<wh>	*when	✔		
/ʃ/ mission	<t>	*mistion/ midtion	✔		
/ʃ/ shine	<ch>	*child			✔
/ʃ/ acquisition	<s>	*accusision		✔	
	<c>	*accusicion	✔		

The tables reveal that there were two sources of errors:

1) *Spelling errors based on interlingual influence of L1 phonological knowledge*

A substantial proportion of the participants' competence spelling errors were consonant substitution, which was phonologically motivated. The high rate of misspellings of English words was attributed to the application of Thai language phonology which influenced the participants' pronunciation, rather than Thai orthography. It was found in the case of the target words <shine> and <jar> that the grapheme <sh> and <j> was misspelled as <ch> and <d> respectively, resulting in substitution errors. Misspelling of the former occurred some 65 times, accounting for 1.88 per cent of all errors, whilst misspelling of the latter occurred 38 times, which accounted for 1.15 per cent of all misspellings which occurred.

Given that Thai lacks the phoneme /ʃ/ and /dʒ/, the participants found it hard to pronounce English words containing those phonemes. This issue involves not only phonological difficulties but articulatory difficulties as well. As a result, most learners utter sounds from Thai, their native language, which to them sound similar to those in the target language. The near-equivalent sounds, in this case, the Thai affricate /c^h/ and plosive /d/, are similar to English /ʃ/ and /dʒ/ in certain respects. That is, the affricate /c^h/ is like the fricative /ʃ/ in the sense that it involves friction; the Thai /d/ is like the affricate /dʒ/ in that it involves a plosive in the sound production as well.

Crucially, a misspelling occurred when the participants attempted to match the sound segment they heard with the Thai /c^h/. They decided on one of a number of possible English graphemes, thereby producing an invented spelling, e.g. <*midtion> for <mission>. Misspellings such as <midtion> or <mistion> suffice to explain James & Klein's (1994:43) claim that the incidence of phonemically reasonable errors (related to L1 and L2 phonology) strongly suggests that the participants used the phonemic access to spelling new words or words they had never come across before.

A number of the English consonant phonemes, e.g. /ʃ/, /tʃ/, and /ʒ/ are represented in the test by the single Thai consonant phoneme /c^h/. Some of the resulting English spellings were: <*major>, <*najor>, <*nather>, <*neither> for <nature> and <*lecture/ later>, <*leture/ letture>, <*layer>, <*leather>, <*leacher/ letcher>, <*lagger> for <leisure>. The words <nature> and <leisure> contain the phonemes /tʃ/ and /ʃ/ respectively, which are absent from the Thai phonological system. As a result, the participants did not normally notice the difference between sounds which English speakers divide into different classes of fricative and affricate consonants. Thus they

produced, for instance, <*na*j*or> and <*let*ch*er>, based on the Thai graphemes <จ>, <ช>, equivalent to the Thai phonemes /c/ and /c^h/ respectively. In the extreme instances, failure to notice the different fricative/ affricate consonant sounds resulted in different word outputs, e.g. <*major> for <nature>; <*leather> or <*layer> for <leisure>. These instances were therefore sub-classified under the phonologically-motivated lexical errors, in the linguistic sub-taxonomy.

In comparison with the performance errors, the distribution of errors across the competence/ performance taxonomy was mutually exclusive: where there were orthographic and morphological errors under performance errors, there were not such errors under competence misspellings, and vice versa. In this regard, only phonological and lexical errors were found under competence misspellings. The distribution, therefore, was in complementary distribution. At this point, it would seem, that the interlingual errors made by the participants were influenced by L1 phonology, rather than L1 writing-system or orthography.

2) *Spelling errors based on inadequate target language spelling knowledge*

Spelling errors revealed that not only the low phonological awareness of the participants, but also their inadequate knowledge of target language spelling, had an effect on their production. This closely relates to the level of English transparency of the orthography, as English demonstrates a phonologically complex writing system, which requires low-proficiency learners of English to acquire knowledge of various spelling rules. The term 'spelling knowledge' is also utilised to cover related fields in generating accurate spelling, including semantic, lexical, grammatical, and phonetic. Based on the data obtained, there were variants of English spellings which did not fit in target words.

To begin with, the frequency of the substitution error: <*embarrace>/ <*embarras> for <embarrass> was 54, accounting for 1.79 per cent of total errors. This suggests that 66 per cent of the participants failed to be aware of digraphs which make one consonant phoneme /s/. Additionally, there were more than 75 occurrences of substitution errors for <judge>. The spelling outcomes were instances like <*juge> or <*just>. This shows that the participants had no knowledge of trigraphs representing one single voiced post-alveolar affricate sound, i.e. /dʒ/. Another highly frequently misspelled word was <*jean> for <gene>. Here, it appears that the participants were not aware of the grammatical fact that 'jean' is required to have a plural form. If the participants had been aware of the fact, one would have expected no intralingual misspelling in this target word. The claim of participants' inadequate spelling knowledge of English is also validated by the spellings of <*the bear necessities> for <the bare necessities>; <*a complementary drink> for <a complimentary drink>. The frequency of such misspellings was 89, accounting for 8.84 per cent of the overall errors. Another target word <van>, very frequently misspelled as <*fan>, implies that phonetically speaking participants could not distinguish the voicing quality, i.e. between voiced and voiceless.

Psychological effects and pedagogical suggestions

Unstructured informal interviews show that affective factors influenced English spelling and writing, in particular when there were time constraints. That is to say, task type where time constraints were inevitable closely correlated with a certain psychological factor, i.e. anxiety. As the findings reveal, most participants showed a poorer performance in spelling to dictation, i.e. Task 2, and it was borne out by the interviews that some invented misspellings were partly caused by time constraints. On the other hand, the teacher participants who conducted the dictation test were influenced by the affective factor of loss of confidence, which prevented them from having totally accurate pronunciation. It appears that in their teaching in class they did not pay as much attention to pronunciation as to the other content of the course. The fact that they neglected the teaching of pronunciation could pose a problem for students' L2 pronunciation acquisition. In light of the findings thus far, there are several factors influencing spelling and writing in English; one of them is interlanguage phonology, which plays a crucial role. Therefore, I offer pedagogical suggestions below to help improve the teaching and learning of English pronunciation in general.

From a pedagogical point of view, some practical implications and recommendations for classroom practice, preferably for Thai teachers at the primary and secondary school levels, might be the following:

a) training in contrastive phonology of Thai and English, focusing on the sounds absent in the Thai phonological system;
b) training in knowledge of English spelling rule, concentrating on grapheme and phoneme principles;
c) training in English pronunciation by native English speakers.

Note that students could also undergo (b) and (c) as part of their English language acquisition to make them aware of their pronunciation and spelling problems and help them correct themselves.

Conclusion

The main goal of this study was to investigate the nature of the Thai and English writing systems, together with the Thai and English phonological systems, and focus on the crucial differences that prevent Thai individuals from mastering the system of spelling and writing in English. The principal results have revealed that the non-native misspellings in this study involve interlingual interference of a negative kind. In this regard, the Thai phonological system affects spelling and writing in English. Its impact seems to have caused the participants in the study to produce either a new existent word or a totally non-existent word. The Thai writing system, on the other hand, is not influential in the production of competence errors. The misspellings in words such as <embarrass> and <acquisition> were influenced by the participants' target language, i.e. the irregularity of grapheme-phoneme correspondences at the phonological level. Meanwhile, phonological misspellings clustered in the interlingual class suggest that a phonological transfer from the native language is

more of a determining factor in non-native writing than writing system transfer from the native language. On the other hand, the misspellings generated could also be claimed to be errors based on inadequate spelling knowledge of the target language. The difficulty of learning the English language is compounded by its well-known lack of correspondence between graphemes and phonemes. Since the participants' knowledge of English orthography is rather limited, as shown by their misspellings, training in contrastive phonology, and grapheme-phoneme interface, e.g. different pronunciations of consonant (and vowel) graphemes, is called for.

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