

# Orthographic and Phonological Features of English Textbooks in Junior High School in Japan

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**Abstract:** *Although the acquisition of English graphophonemics—that is, knowledge of the relationships between letters and sounds—requires explicit instruction, especially for learners of English as a foreign language (EFL), English textbooks in Japan rarely address that aspect of language. To partly overcome such neglect, this paper reports an analysis of the orthographic and phonological features of 964 words included in Japanese English textbooks. The results indicate that more than a third of letters in those words have sounds that do not exist in Japanese pronunciation. In response, English education in Japan, especially at earlier stages of learning, should pay greater attention to the explicit instruction of English graphophonemics in EFL classrooms.*

**Keywords:** Graphophonemics, Orthographical and phonological features, English textbooks, Japanese junior high school, explicit instruction

## 1. Introduction

Although the correspondence of graphemes and phonemes in English is difficult to grasp even for native English speakers [1], it is especially more difficult to understand for learners of English as a foreign language (EFL), especially Japanese EFL learners. Compared to Japanese, English exhibits starkly different orthographic depths—that is, degrees of correspondence between graphemes and phonemes [2, 3]. Moreover, whereas the English alphabet has a deep orthographic structure, all Japanese language systems, namely hiragana and katakana, demonstrate a shallow orthography except for kanji, a Chinese-derived character system [2]. More precisely, hiragana and katakana are phonograms, in which each grapheme in the language system represents a phoneme or syllable; Italian and Spanish are also phonograms. However, English and French are ideograms, in which the combination of phonemes and graphemes is multiple [1, 4]. To further complicate matters for Japanese EFL learners, English has several pronunciations that do not exist in Japanese pronunciation.

Table 1 shows a modified version of a table of English phonemes that correspond with graphemes [5, 6]. For example, the letter ‘a’ can be read in eight different ways in English: /a:/ as in ‘**a**sk’, /eɪ/ as in ‘**ma**ke’, /ɪ/ as in ‘**me**ss**a**ge’, /ɔ:/ as in ‘**w**ater’, /e/ as in ‘**ma**ny’, /æ/ as in ‘**a**pple’, /eə/ as in ‘**ma**re’, and /ə/ as in ‘**wom**an’. By contrast, in Japanese, the letter ‘a’ is always pronounced as /a/. For Japanese learners of English, reading the grapheme ‘a’ as /æ/ is more difficult than reading ‘a’ as /a:/ because the pronunciation of /æ/ does not exist in Japanese. Such learners thus read, ‘carry’ as /kari:/, not /kæri/. Pronouncing /æ/ is challenging for Japanese EFL learner even they hear a native speaker’s pronunciation of /æ/ because the phoneme does not exist in Japanese pronunciation.

**Table 1:** Modified Version of Narita’s (2009) and Cruttenden’s (2014) Tables of English Graphemes That Correspond with English and Japanese Phonemes

G	P	
<a>	Y	/a:/ /eɪ/ /ɪ/ /ɔ:/ /e/
	N	/æ/ /eə/ /ə/

<e>	Y	/e/ /a/ /i:/ /ɪ/ /eɪ/ /ɛ/
	N	/ə/
<i>	Y	/i/ /i:/ /ɪ/ /aɪ/
	N	/æ/ /ə/ /ə:/
<o>	Y	/ɔ/ /a/ /ɪ/ /o/ /u:/ /ɔ:/
	N	/əʊ/ /ɪ/ /ɜ:/ /ə/
<u>	Y	/e/ /ɪ/ /w/ /u:/ /jɪu:/ /jɔ:/ /ʊ/
	N	/ɪ/ /ə/ /ə:/ /ɛ/
<y>	Y	/i/ /ɪ/ /aɪ/
	N	
<au>	Y	/ɔ/ /ɔ:/
	N	
<ai>	Y	/e/ /eɪ/
	N	/ə/ /eə/
<ee>	Y	/i:/ /ɪ/
	N	
<ea>	Y	/i:/ /e/ /a:/
	N	/ɪə/ /eə/ /ə:/ /æə/ /aə/ /juə/
<eu>	Y	/ju:/
	N	/ə/ /juə/
<ei>	Y	/eɪ/
	N	/ə/ /eə/
<ie>	Y	/i:/
	N	/ə/ /iə/
<oo>	Y	/u:/ /ʊ / / ʌ / /ɔ:/
	N	/uə/
<oa>	Y	/au/ /ou/
	N	/auə/
<ou>	Y	/aʊ/ /ɔ:/ /u:/ /a/ /ɪ/ /ʊ/
	N	/ə/ /əʊ/
<oi>	Y	/ɔɪ/
	N	

G= grapheme, P = phoneme

Y = phoneme that exists in Japanese pronunciation

N = phoneme that does not exist in Japanese pronunciation

Note. Boldface indicates that the phoneme follows a one-to-one grapheme-phoneme relationship in Japanese.

English education in Japan has largely neglected to address the mentioned difficulties that Japanese EFL learners face when they learn to read English at school. For example, although English has been included in foreign-language activities in the elementary-school curriculum, which is part of a national syllabus, namely the *Course of Study*, proposed by the Japanese Ministry of Education, Culture, Sports, Science, and Technology, the primary focus of teaching and

learning English is developing students' communication skills, especially for speaking [7, 8, 9, 10]. Students are encouraged to listen to and play games with assistant teachers who are native speakers of English in order to become more familiar with English sounds and to better understanding different cultures. However, reading is not encouraged in the elementary-school syllabus except at the level of word acquisition, for which teachers typically show cards with the pictures and names of objects. In junior high schools in Japan, English is included as an academic subject in the *Course of Study*, and students are encouraged to read at more than an elementary-school level [11]. Nevertheless, the major focus is acquiring English communication skills, especially listening and speaking skills, while explicit instruction in English grapheme and phoneme relationships in the textbooks remains absent, as shown in previous studies [12, 13]. Moreover, the importance of English grapheme-phoneme relationships is acknowledged only in very few English education research studies [e.g. 14].

To partly overcome such neglect, this paper reports an analysis of the orthographic and phonological features of 964 words included in English textbooks in Japan's junior high schools, with particular attention to words containing phonemes that do not exist in Japanese pronunciation.

## 2. Material and Method

The materials for the study included vowel graphemes included in *New Crown English Series 1-3* (2011), textbooks which target students' acquisition of English communication skills and seek to provide a balance of four skills activities: listening, speaking, reading, and writing. To analyze the orthographic and phonological features of the 964 words in the textbooks for students in junior high school, the author transcribed all words in alphabetical order in an Excel file, after which the transcription of words into phonemes was performed by using PhoTransEdit software [15]. When the phoneme of the word was not included in PhoTransEdit, the *Shogakukan Random House English-Japanese Dictionary* (2nd edition) was used to transcribe the word. Phonemes were organized into different rows of the Excel file according to their number of syllables, and all phonemes of syllables were rearranged in alphabetical order. Last, all phonemes of syllables were divided into two categories: phonemes that exist in Japanese pronunciation (Y) and phonemes that do not exist in Japanese (N).

## 3. Results and Discussion

An example of a vocabulary list in the *New Crown English Series 1-3* with phonemes appears in Table 2. From left side of the table, the first column indicates the textbook series number; for example, '1' refers to the *New Crown English Series 1*, which is used by first-year students in junior high school in Japan. The fourth to eighth columns from the left indicate the order of the syllable in the word; for example, 'alone' is a two-syllable word in which the first phoneme is /ə/ and the second is /laun/.

**Table 2:** An Example of a Vocabulary List in the New Crown

Series			1st	2nd	3rd	4th
2	alone	ə laun	ə	laun		
3	along	ə lɔ:ŋ	ə	lɔ:ŋ		
3	already	ɔl re di	ɔl	re	di	
1	also	ɔls ou	ɔls	ou		
2	always	ɔ:l weɪz	ɔ:l	weɪz		
1	am	æm	æm			
1	America	ə mer ɪk ə	ə	mer	ɪk	ə
3	among	ə mʌŋ	ə	mʌŋ		
1	and	ænd	ænd			
3	angry	æŋ grɪ	æŋ	grɪ		
1	animal	æ nəm l	æ	nəm		
2	another	ə nʌð ɹ	ə	nʌð	ɹ	
2	answer	æ n sər	æ n	sər		
1	ant	ænt	ænt			
1	any	e ni	e	ni		
2	anyone	e ni wʌn	e	ni	wʌn	
2	anything	e ni θɪŋ	e	ni	θɪŋ	
2	anywhere	e ni wer	e	ni	wer	
2	apply	ə plai	ə	plai		

Descriptive statistics of the analysis appear in Table 3. Although the number of new words does not correspond to the series number, the average syllables per word showed a modest increase, which suggests that the older the students, the larger the number of syllables that they encounter in English textbooks.

**Table 3:** Descriptive Statistics of the Analysis

	First	Second	Third	Total
Number of words	415	308	241	964
Number of syllables	630	486	427	1543
Mean number of syllables per word	1.5	1.57	1.77	1.6

Table 4 shows the frequency and percentage of the occurrence of each phoneme. Of all 1,543 phonemes, 33.6% do not exist in Japanese pronunciation. Consequently, when students in Japanese junior high schools read the textbooks, more than a third of the vowels are difficult to read aloud. Even if the vowel sounds exist in Japanese pronunciation, the L1 knowledge of students might interfere with their ability to properly read the sounds, for unlike Japanese, English does not have one-to-one relationships between graphemes and phonemes. Considering that English-Japanese dictionaries available in Japan use different symbols, it is necessary to provide explicit instruction in reading English phonemes and graphemes.

**Table 4:** Frequency and Percentage of Phonemes

Phoneme	n	%
/a:/	88	6.0
/ai/	93	6.3
/au/	25	1.7
/e/ /e:/	160	10.9
/ei/	85	5.8
/i/ /i:/	352	23.4
/ie/	9	0.6
/io/	1	0.1
/u/ /u:/	100	6.8
/ɔ/ /ɔ:/	63	4.3
/ɔi/	6	0.4
/æ/	99	6.7
/ə/	340	23.1
/ʌ/	55	3.8

Total	1,543	100.0
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\*n=number

Note. Boldface indicates that the phoneme do not exist in Japanese.

#### 4. Conclusion

Although the findings offer some insights into the less-addressed topic of EFL reading in junior high schools in Japan, the study pose some limitations. For one, the limited materials used might have limited the outcomes. Moreover, limiting the transcription of words into General American phonemes might have distorted the results, for Received Pronunciation should also be included in such research.

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