Visualization of Phonetic Markers for Early ESL Learners in Japan

Kevin R. WROBETZ

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I. Introduction

English education in Japan, since April of 2011, begins in the 5th grade in elementary school, continues through the rest of the period of compulsory education, on into high school, and officially ends for most after graduation from university (McCurry). With so much attention on formal education in the English language within the Japanese school system, it is an easy assumption to make that Japanese educators place a great deal of importance on ensuring that their students graduate with a high level of proficiency in the English language. Despite the length of formal education in the English language, Japan has a rating level of "low proficiency" according to the English Proficiency Index published by Education First, an internationally accredited educational language institute that annually publishes data related to English proficiency (EF). Although there is not any one factor to blame, nor any one pedagogical method that can be employed to drastically improve the English proficiency score of Japan overnight, there are a number of observations that can be made as to why proficiency scores are so low, and how they may be improved.

One area of improvement that can be made within the English education system in Japan concerns the consistent misreading of English phonology. In particular, natural English vowel phonemes are often subjected to Japanese

phonetic rules resulting in a host of misreading and pronunciation problems for Japanese ESL students. The grand majority of non-native speakers of English will speak with an accent to a certain degree. Although speaking with an accent is not an adequate indicator of proficiency in a foreign language, John Murphy puts forth in his research on designing foreign language curriculums that speaking, listening, and pronunciation are all "reciprocally interdependent oral processes," and that the more attention that is paid to correct pronunciation in the target language (hereafter referred to as L2), the higher the benefit it will have on conversation with native speakers, and on listening abilities (Murphy, 51). English education in Japan, unfortunately, is highly affected by the influence of the Japanese kana writing system and the strict romanization rules that govern the conversion of Japanese phonology into the Latin alphabet. These romanization rules stymie correct pronunciation of natural English vocabulary.

These romanization rules are taught after the acquisition of the Japanese kana system, and the same phonetic rules of pronunciation that govern kana are applied to the Latin alphabet. This means that from a very young age, the Japanese ESL learner has already made the connection between Japanese kana phonology and the Latin alphabet, and this association is one of the primary causes for the mispronunciation of natural English vocabulary. Fortunately, there is a pedagogical method that can be employed in the classroom that utilizes this learned association between the kana system and the Latin alphabet in order to re-educate young Japanese ESL students in correct English pronunciation. This research will discuss how a visualization of phonetic markers through a color coding system applied to the Japanese kana system and the Latin alphabet has shown great promise in retraining the pronunciation of natural English vocabulary in a group of Japanese elementary school students. The visualization of the English phonetic system presented in this research has been oriented to the General American Accent as defined by Kövecses in *American English, an Introduction*. This visualization system can be oriented to any variation of English language accents, but would require modification of the visualization system presented in this research.

II. Visualization of Phonetic Markers

The highly irregular phonetic structure of the English language is both well

known, and bemoaned by both native and non-native speakers alike. In particular, the irregular nature of English vowel phonemes makes basic literary tasks in the English language such as reading and writing an irksome task for native speakers, and outright challenging for non-native speakers. Acquiring proficiency in the numerous irregularities in English vowel phonemes is particularly exacerbated when the student's native language (hereafter referred to as "L1") is Japanese. An L1 language that utilizes the Latin alphabet, or any similar writing system that represents single phonemes with a single character (such as Cyrillic in Slavic language families or Korean Hangeul), an intrinsic understanding of this type of phonology aides in linguistic acquisition, but for students whose L1 is Japanese, the consonant/vowel syllabic kana system can actually make acquiring adequate proficiency in reading and writing in the English language even more challenging. This is supported by English proficiency levels being higher throughout Europe (most countries rating at "proficient," "high," or "extremely high proficiency" on Education First's English Proficiency Index) and in Korea (rating at "proficient") when compared to English proficiency levels in Japan (rated at "low"). Core skills such as accurate reading and writing directly affects speaking and listening skills, and without a proper understanding of English phonetic structure, further development in English proficiency may be delayed, discouraged, and even stunted. The indoctrination of the Japanese kana system in early childhood confronts young Japanese ESL learners with an educational barrier to the English phonetic system, and the introduction of a visual phonetic system can be used in conjunction with the kana system to guide students to higher levels of proficiency in reading and writing.

Multi-phoneme writing systems such as Japanese kana exhibit a higher frequency of phonetic regularity by necessity of design, whereas the design of the Latin alphabet makes it quite easy for single letters to come to represent various phonemes, as is often the case in English. The entire kana system is built upon its vowel foundation "ア・イ・ウ・エ・オ" (*a*, i, u, ɛ, o), which in turn structures all other kana blocks "カ・キ・ク・ケ・コ" (k*a*, ki, ku, kɛ, ko). All "ア" structured characters must fall within the pronunciation parameters of that category, or the patterned system would fall apart. On the other hand, the Latin alphabet's vowels A, E, I, O, U do not structure any other phonetic character in the alphabet, thus freeing any one vowel to represent any number of possible

phonemes. In English, the vowel "A" is free to represent the short "A" phoneme (æ) such as in the word "cat", but can just as well represent the short "O" phoneme (ɑ) such as in the word "car". Despite the words "cat," and "car" being spelled with the same vowel, the vowel phoneme is entirely different. In the Japanese kana system, the "ヤ" used in the romanization "キャット" (kiɑ:to) and the "カ" used in the romanization "カー" (kaa) are both in the "ア" phoneme group, and the vowels therein are therefore pronounced in exactly the same way, despite the fact that the original English uses two different phonemes. These fundamental differences between the English utilization of the Latin alphabet and the Japanese kana pose unique difficulties in early ESL education in Japan.

Japan, despite having one of the highest levels of literacy in the world, has an exceptionally complex writing system (Kanaya, 13). Borrowing Chinese ideograms, and subsequently a host of unique vocabulary with pronunciations foreign to the native Japanese linguistic system of the time, these characters were adopted into what would become the kanji system, the first writing system in Japan. The kana system, developed after the integration of kanji, provided the necessary phonetic elements to the Japanese kanji system. The existence of the phonetic kana greatly simplifies the educational process to delineate whether any given kanji character has an adopted pronunciation from the original Chinese, or the original Japanese pronunciation. The phonetic kana system has also allowed for the adoption of other foreign born vocabulary regardless of the inherent incompatibilities of the two linguistic systems. The importance of the development of the kana system cannot be understated, however the strict phonetic nature that naturally developed in the kana system, combined with the fact that the Japanese language already had a history of reworking the phonetic features of foreign words to the Japanese kana system, creates a host of phonetic inconsistencies which can hinder early ESL learners in Japan who have already been indoctrinated into the kana system.

The most common hurdles created by the differences in vowel phonology between the English Latin alphabet and Japanese kana are the misreading of the vowel phonemes and the insertion of unnecessary vowels in vocabulary ending in a consonant phoneme. In Figure 1, shown below, two foreign adopted words, "エジプト / Egypt" and "ホットコーヒー / hot coffee," demonstrate how strict adherence to the phonetic principles of the Japanese kana system can hinder not

Figure 1. Vowel Phonemes Comparison			
Japanese Vowel Phonemes		English Vowel Phonemes	
え・エ	エジプト	i い・イ	Egypt
お・オ	ホットホーヒー	ɑ あ・ア	hot coffee

Figure 2. Vowel Romanization	
Japanese	English
あ・ア	A
い・イ	I
う・ウ	U
え・エ	E
お・オ	O

only correct reading of English pronunciation, but consequently communication between Japanese non-native English speakers and native English speakers. The adoption of the Latin alphabet to the Japanese kana system requires that all vowel phonemes conform to the Japanese vowel structure, shown to the right in Figure 2. Once these strict pronunciation rules for vowel phonemes are learned, it serves as a universal guide for the pronunciation of all words written in the Latin alphabet, even when the English language attaches numerous vowel phonemes to a single letter. In the "Egypt" example in Figure 1, all native English speakers will pronounce the "E" vowel as the the elongated "E" vowel, "i," or "イ." However, a Japanese speaker familiar with Japanese romanization rules, as seen in Figure 2, will, without specific instruction in English pronunciation, almost invariably pronounce the "E" in "Egypt" as a short "E", "ɛ," or "エ" resulting in "エジプト" instead of "イジプト." The second example in Figure 1, "hot coffee," runs into a similar problem. Most English speakers, variations in accents notwithstanding, will pronounce the "O" in both "hot" and "coffee" as the short "O", "ɑ," or "ア." However, a Japanese speaker who has learned that the Latin "O" is always romanized as an "オ" will disregard variability in English language vowels and pronounce "hot coffee" as "ホットコーヒー" instead of "ハットカーヒー."

The second problem encountered in the strict adherence to Japanese kana rules in the adaptation of English vocabulary is the unnecessary insertion of extra vowels. Due to the multi-phoneme syllabic structure of the Japanese kana system, any lone consonant phoneme in an English word must be accompanied by a vowel when adapted to the kana system. Therefore, when a Japanese speaker

Figure 3.1 Monochromatic Table Color Code			
Yellow=Y	Purple=Pr	Magenta=M	Gold=Gl
Orange=O	Blue=Bl	Cyan=C	Pink=Pn
Red=R	Green=Gr	Silver=S	Non-Coded=__

Figure 3. 2 Vowel Phonemes (Monochromatic Version)

Japanese Kana Color Code

あ・ア (Y)	か・カ (Y)	さ・サ (Y)	た・タ (Y)	な・ナ (Y)	は・ハ (Y)	ま・マ (Y)	ら・ラ (Y)	や・ヤ (Y)	わ・ワ (Y)
い・イ (O)	き・キ (O)	し・シ (O)	ち・チ (O)	に・ニ (O)	ひ・ヒ (O)	み・ミ (O)	り・リ (O)		
う・ウ (R)	く・ク (R)	す・ス (R)	つ・ツ (R)	ぬ・ヌ (R)	ふ・フ (R)	む・ム (R)	る・ル (R)	ゆ・ユ (R)	
え・エ (Pr)	け・ケ (Pr)	せ・セ (Pr)	て・テ (Pr)	ね・ネ (Pr)	へ (Pr)	め・メ (Pr)	れ・レ (Pr)		
お・オ (Bl)	こ・コ (Bl)	そ・ソ (Bl)	と・ト (Bl)	の・ノ (Bl)	ほ・ホ (Bl)	も・モ (Bl)	ろ・ロ (Bl)	よ・ヨ (Bl)	を・ヲ (Bl)

English Equivalent Color Code

ɑ (Y)	O (Y)	hot	A (Y)	tall	AW (Y)	paw		
i (O)	E (O)	Egypt	EA (O)	team	EE (O)	sleep		
u (R)	OO (R)	food	U_E (R)	flute	OU (R)	ghoul		
ɛ (Pr)	E (Pr)	bed	EA (Pr)	bread				
o (Bl)	O (Bl)	hotel	OA (Bl)	float	OW (Bl)	bowl		

Japanese Kana Diphthongs Color Code		English Equivalent Color Code				
あい・アイ (Gr)	ガイ=Grド=Bl	aɪ (Gr)	Y (Gr)	fly	IGH (Gr)	fight
えい・エイ (C)	グ=Rレイ=Cト=Bl	eɪ (C)	AY (C)	play	A_E (C)	bake
あう・アウ (M)	ダウ=Mンタウ=Mン	au (M)	OW (M)	down	OU (M)	foul

English Specific Color Code					Non-Coded Characters	
æ (S)	A (S)	cat			ん・ン	
ɪ (Gl)	I (Gl)	bit	E (Gl)	English	っ・ッ	
ə (Pn)	U (Pn)	nut	O (Pn)	ton	All English Consonants	

unfamiliar with English phonology, but familiar with Japanese romanization rules is confronted with the English word "Egypt," the Japanese speaker will adapt the "P" phoneme to the Japanese "プ / pu"; likewise, the "T" phoneme at the end of both words "Egypt" and "hot", as they too are unaccompanied by vowels, will adapt said phoneme to the Japanese "ト / to." As has been previously established, the kana system has been fundamental to the development of modern Japanese. However, the very nature of the kana system creates a Japanese accent when novice ESL learners apply kana romanization rules to natural English. This accent along with the incorrect assumptions made about English vowel phonology, unfortunately, can serve to hinder young Japanese ESL learners in all fundamental areas of language acquisition, from reading, to writing, to speaking, and even in listening. Fortunately, there is a simple method of helping guide young ESL learners into a deeper understanding of natural English phonology that utilizes the learner's innate knowledge of the kana system in conjunction with colorized phonetic markers in subsequent English vocabulary.

The visual phonetic system demonstrated in this research utilizes color coding in both the Japanese kana system and in the vowel phonemes of the English Latin alphabet in order to help break young ESL learners of the habit of universally applying Japanese vowel romanization rules to natural English vocabulary. As is shown in Figure 3.2 (monochromatic) above, a single color is assigned to each of the Japanese vowel phoneme groups, as well as to each subsequent kana permeation, regardless of the attached consonant phoneme; similarly, the same color coding system is applied to the true phonetic equivalent in the English Latin alphabet, regardless of the letter. Three of the most common Japanese diphthongs (Figure 3.2) have also been assigned their own color codes on the principle that the Japanese diphthongs that must always utilize two vowels in the kana system do not always require two vowels in the English Latin alphabet. Three vowel phonemes not included in the Japanese kana system (Figure 3.2) have also been given their own color codes to help break the habit of Japanese speakers of English assigning similar sounding Japanese vowel phonemes to English vowel phonemes that are outside the natural range of the kana system. The vowel extender bar in katakana (ー) and the hiragana equivalent (う) are coded with the vowel phoneme that precedes them. Finally, the unvoiced, and hence, non-phonetic glottal stop, three-fourths sized kana characters (っ • ッ), the singular

non-vowel phoneme kana symbols (ん・ン), as well as all English consonants are left uncoded in black font. This color coding system applied to both Japanese and natural English vowel phonologies has strong pedagogical applications to help young ESL learners in Japan visualize natural English phonology.

As mentioned earlier, a major barrier for Japanese ESL students to a proficient understanding of natural English phonology is the near universal application of Japanese vowel romanization rules to natural English vocabulary. This is primarily a problem, because English phonology is, for better or worse, highly irregular, and a single letter in the Latin alphabet can represent a variety of distinctly different phonemes. Considering this irregularity in the application of the Latin alphabet to English phonology combined with the foreknowledge of the highly regular and structured Japanese kana system, it is no wonder why Japanese ESL students have difficulties in acquiring proficiency in English phonology. When young children are taught the Latin alphabet in Japan, they are invariably taught to apply kana phonology to the Latin alphabet, and subsequently anything spelled in the Latin alphabet thereafter. It is because of this pedagogical approach in teaching the Latin alphabet that when a Japanese ESL student sees a "ho," it automatically becomes "ホ," and thus when a Japanese ESL student learns the English word "hot," it is invariably mispronounced as "ホット". While an instructor can very easily utilize a phonetic alphabet in class in order to teach correct pronunciation, the use of such alphabets abandons natural English spelling (irregular though it may be) in favor of an entirely new writing system that the students must learn in conjunction with the Latin alphabet. Indeed, it seems the more efficient approach to utilize a phonetic writing system that preserves natural English spelling, while at the same time aiding in correct pronunciation. The visualization of phonetic markers utilized in this research shows promise to accomplish this task by helping break the habit of applying kana phonology to natural English vocabulary by circumventing the irregular nature of English spelling, and using instead a color coded system to aid Japanese ESL students in correct pronunciation.

In Figure 4 (monochromatic) below, a selection of English vocabulary has been subjected to the color coding system as shown in Figure 3.2. There are four points of pedagogical application that can be derived from the selection of visually coded vocabulary used in Figure 4. First and foremost, because of the

Figure 4 Classroom Disambiguation of Vowel Phonemes (Monochromatic Version)			
Japanese Vowel Phonemes		**English Vowel Phonemes**	
あ・ア (Yellow・Y)	ハロー (ハ＝Y)(ロー＝Bl)	ɑ (Y)	hot coffee h (o=Y) t c (o=Y) ff (ee=O)
い・イ (Orange・O)	イングリッシュ (イ＝O)ン(グ＝R) (リ＝O)ッ(シュ＝R)	i (O)	Egypt (E=O) g (y=Gl) pt
う・ウ (Red・R)	ウルトラマン (ウ＝R)(ル＝R)(ト＝Bl) (ラ＝Y)(マ＝Y)ン	u (R)	food f (oo=R) d
え・エ (Purple・Pr)	エジプト (エ＝Pr)(ジ＝O)(プ＝R)(ト＝Bl)	ɛ (Pr)	hello h (e=Pr) ll (o=Bl)
お・オ (Blue・Bl)	ホットコーヒー (ホ＝Bl)ッ(ト＝Bl) (コー＝Bl)(ヒー＝O)	o (Bl)	bowl b (ow=Bl) l
Combination Vowels			
あい・アイ (Green・Gr)	アイスクリーム (アイ＝Gr)(ス＝R) (ク＝R)(リー＝O)(ム＝R)	aɪ (Gr)	ice cream (i=Gr) c (e=Gr) cr (ea=O) m
えい・エイ (Cyan・C)	エイト (エイ＝C)(ト＝Bl)	eɪ (C)	eight (eigh=C) t
あう・アウ (Magenta・M)	ダウンタウン (ダウ＝M)ン(タウ＝M)ン	au (M)	downtown d (ow=M) nt (ow=M) n
		English Specific Vowels	
		æ (S)	jam j (a=S) m
		ɪ (Gl)	English (E=Gl) ngl (i=Gl) sh
		ə (Pn)	Ultraman (U=Pn) ltr (a=Pn) m (a=S) n

merged multi-phoneme syllabic structure of the kana system, save for the glottal stop "ッ" and the lone consonant kana "ン," each kana character is fully colored. When observing the English vocabulary used in Figure 4, the Japanese ESL

Figure 5.1 Color Coded Vowel Phoneme Flashcards, Front and Back (Test Group) Monochromatic					
Group 1		Group 2		Groups 2 and 3	
(Y)	あ・ア	A (S)	hat h (a=S) t	OW (Bl)	bowl b (ow=Bl) l
(O)	い・イ	AY (C)	play pl (ay=C)	OW (M)	bow b (ow=M)
(R)	う・ウ	E (Pr)	get g (e=Pr) t	ハロー (Y, Bl, Bl)	hello (e=Pr, o=Bl)
(Pr)	え・エ	EE (O)	sleep sl (ee=O) p	イングリッシ (O, __, R, O, __, Bl)	English (E=Gl, i=Gl)
(Bl)	お・オ	I (Gl)	hit h (i=Gl) t	ウルトラマン (R, R, Bl, Y, Y, __)	Ultraman (U=Pn, a=pn, a=S)
(Gr)	あい・アイ	IGH (Gr)	fight f(igh=Gr) t	エジプト (Pr, O, R, Bl)	Egypt (E=O, y=Gl)
(C)	えい・エイ	O (Y)	shop sh (o=Y) p	ホットコーヒ (Bl, __, Bl, Bl, Bl, O, O)	hot coffee (o=Y, o=Y, ee=O)
(M)	あう・アウ	O_E (Bl)	hope h (o=Bl) p (e=Bl)	ナイスショット (Gr, Gr, R, Bl, __, Bl)	nice shot (i_e=Gr, o=Y)
(S)	æ	U (Pn)	hut h (Pn) t	サンド (Y, __, Bl)	sand (a=S)
(Gl)	ɪ	U_E (R)	flute fl (u=R) t (e=R)	ボブ (Bl, R)	Bob (o=Y)
(Pn)	ə	OO (R)	food f (oo=R) d	アメリカ (Y, Pr, O, Y)	America (A=Pn, e=Pr, i=Gl)

student will immediately notice that English words are peppered with non-coded consonants. This provides a visual reinforcement to help break the habit of attaching vowel phonemes to stand alone consonant phonemes in natural English vocabulary; whereas the "プ" and "ト" are coded for their respective vowel

Figure 5.2 Color Coded Vowel Phoneme Flashcards, Front and Back (Control Group)					
Group 1		Group 2		Groups 2 and 3	
	あ・ア	A	hat	OW	bowl
	い・イ	AY	play	OW	bow
	う・ウ	E	get	ハロー	hello
	え・エ	EE	sleep	イングリッシュ	English
	お・オ	I	hit	ウルトラマン	Ultraman
	あい・アイ	IGH	fight	エジプト	Egypt
	えい・エイ	O	shop	ホットコーヒー	hot coffee
	あう・アウ	O_E	hope	ナイスショット	nice shot
	æ	U	hut	サンド	sand
	I	U_E	flute	ボブ	Bob
	ə	OO	food	アメリカ	America

phoneme group in the Japanese "エジプト," the English equivalents "P" and "T" are not coded to a vowel group. Second, Japanese students are immediately confronted with the fact that vowel phonemes in natural English pronunciation do not always relate to Japanese romanization rules; the "E" in "Egypt" is not coded to the "エ," but rather the "イ" vowel phoneme group. Third, the idea that individual vowels and diphthongs in English, in contrast to Japanese vowels and diphthongs, can cover a range of phonetic variations is visually represented; the "ow" in bowl is coded to the "オ" phoneme group, where as the "ow" phonemes

in "downtown" are coded to the "アウ" diphthong phoneme group. Finally, English specific vowel groups are color coded to their own phonetic groups, so as to guide Japanese ESL students away from the habit of assigning Japanese vowel phonemes to English vocabulary that do not use those specific phonemes; the "U" and the "As" in "Ultraman" are assigned to the "ə" and "æ" phonetic groups instead of the "ウ" and "ア" phonetic groups.

The visualization of these pedagogical applications, if properly applied in the classroom, can provide automatic instruction in the most mistaken aspects in natural English phonology made by Japanese ESL students. Not only does it use the students' knowledge of their own phonetic system as a primer to instruction in natural English phonology, but the visualization of phonetic markers also preserves natural English spelling. The next section will discuss how this visual system was applied to a group of Japanese elementary school students to test the efficiency of the visual system's design.

III. Methods and Results

Two sets of flashcards listed above in Figure 5.1 were presented to a group of twenty Japanese elementary school students studying English between the ages of 6-8; one set was color coded with the phonetic visualization system described in the previous section (Figure 5.1, Test Group), and the other set was a plain monochromatic set without the phonetic visual cues (Figure 5.2, Control Group). The monochromatic flashcards without phonetic visual cues were presented to a group of ten elementary school students, and the color coded flashcards were presented to a group of the remaining ten students. Each student group was chosen at random without respect to age or proficiency in English. Each student group was then rated on correct pronunciation of each card's vowel phoneme; if the students mispronounced a consonant phoneme, the same students were still counted as being correct if the vowel phoneme was pronounced correctly. If, however, the student added in a vowel phoneme not present in the natural English phonetic pronunciation, then the flashcard was marked as being incorrect. Each of the three flashcard groups, as shown in Figure 5.1, were shown to both student groups three times. The number of correct answers was then averaged together to produce the group's total score for each respective flashcard group as percentage correct. The results are listed in Figures 6.1 and 6.2.

Figure 6.1 Color Coded Student Group Results (Test)

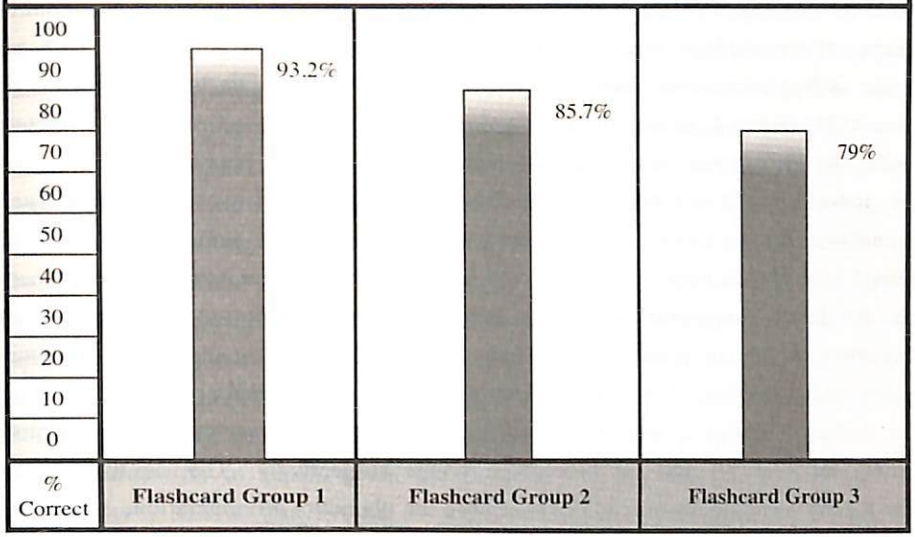
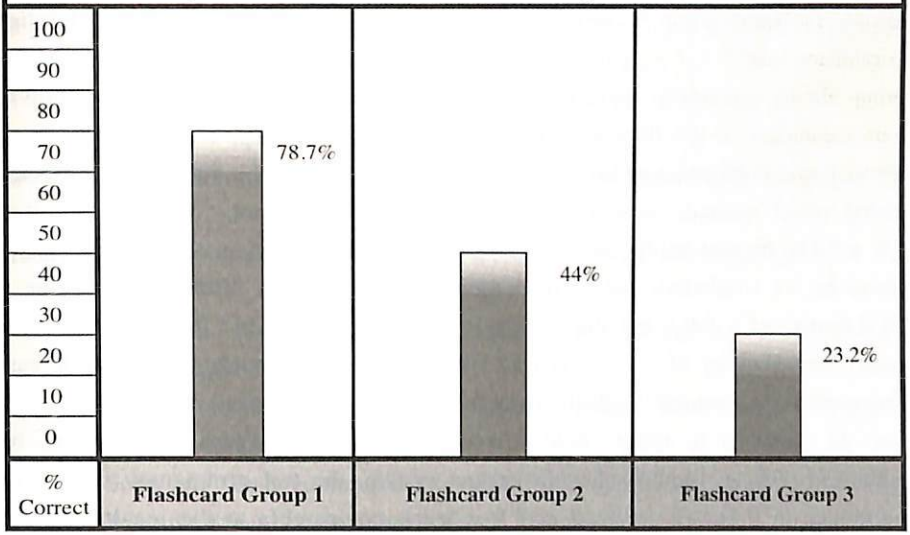


Figure 6.2 Non-Color Coded Student Group Results (Control)



As can be seen in Figures 6.1 and 6.2 above, the group of ten students who received training with the color coded flashcards vastly outperformed the control group of ten students who received regular, monochromatic flashcards with no color coding whatsoever. Both groups performed well with flashcard group 1, as was to be expected, as this flashcard group is mostly composed of kana characters with just three vowel phonemes not included in Japanese phonology (æ, ɪ, and ə). Indeed, had it not been for the three English native vowel phonemes, each group would have scored a one hundred percent. That being said, the color coded group still outperformed the control group by over ten percentage points. There is therefore a statistical correlation between a faster rate of acquisition and retention of foreign phonetic characters when they are associated with a visual color coding system. This statistical correlation is even more apparent, however, in flashcard groups 2 and 3, wherein the test group outperformed the control group by over 40 and 50 percentage points respectively. The control group, having received no color coding assistance in phonetic pronunciation, tended to fallback on Japanese romanization rules to guide their pronunciation of natural English vocabulary; indeed, the most common mistakes made by the control group in the flashcard group 2 test were common Japanese adaptations of English vocabulary: hat＝ハット, get＝ゲット, and food＝フード. Similarly, the control group almost universally applied the Japanese pronunciation to the English equivalent vocabulary in the flashcard group 3 test. The test group, on the other hand, showed vast improvements in correct English pronunciation by following the color coded vowel scheme; suddenly the "sho" in "shop" was not "ショ," but rather "シャ." The biggest hurdle for the test group was the insertion of an extra vowel phoneme for vocabulary ending in consonants; the "Bo" in "Bob" did become a "バ" instead of a "ボ," but the consonant end still became a "ブ," resulting in a closer romanization of "バブ" instead of "ボブ." So although there was a vast improvement in natural English vowel phoneme pronunciation, the students still had the tendency to insert "hidden vowels" as it were. Were this area to be addressed with an updated phonetic coding system, the test group may well have performed in flashcard groups 2 and 3 at levels comparable to the results seen in flashcard group 1.

IV. Conclusion

The system for the visualization of phonetic markers presented in this research has the potential to successfully retrain the pronunciation habits and phonetic understanding of the Latin alphabet in Japanese ESL students. The areas that this visual phonetic system has proven itself particularly useful in is in counteracting the habit of Japanese students applying the romanization rules of the kana system to natural English vocabulary. Furthermore, the system has shown to reduce the frequency of "hidden vowels" added to the ends of standalone consonants in natural English vocabulary by young Japanese speakers of English. This system is easily implemented, uses the students' knowledge of their native Japanese kana system as a primer for the system's color code, does not require learning an additional alphabet, and preserves natural English spelling (irregular though it may be). Though the implementation of this system is not a panacea for English education in Japan, given the significant results shown and presented in this research, should this system be implemented on a larger scale in a formal education system in Japan, it may be potent enough to correct some of the most common mistakes made by young Japanese speakers. This will not ensure that English proficiency will continue to rise in Japan, but it would almost certainly be a step in the right direction.

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Visualization of Phonetic Markers for Early ESL Learners in Japan

Kevin R. WROBETZ

Abstract

Japan has consistently earned the score of "low English proficiency" according to the English Proficiency Index, and is consistently outperformed by other developed countries. Although there are many root causes for this low ranking, and although there are no simple solutions to bringing the general level of English proficiency within the Japanese education system up, one key to understanding how Japanese students approach English language acquisition is to look at how the Japanese approach their own language. Indeed, as is the assumption of this research, the very nature of the overbearing phonetic bracing imposed on English phonology by the Japanese kana system sets students up with a very unnatural understanding of natural English pronunciation, and may lead to a host of linguistic problems in reading, writing, listening, and speaking as the student progresses through the confusing labyrinth that has become modern English. This research presents a visual system of phonetic markers linked to both the Japanese kana system and natural English vocabulary with the aim to break young students of the aforementioned habit of imposing Japanese phonetic structure to natural English vocabulary before it has a chance to take root. The system was tested on a group of 20 Japanese elementary school students, and drastically improved students' scores in pronunciation and reading tests. This suggests that the implementation of just such a system stands to have a high degree of success in formal educational environments.