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Phonological Differences between Japanese and English: Several Potentially Problematic
Areas of Pronunciation for Japanese ESL/EFL Learners

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Bio Statement

Kota Ohata earned his B.A. degree from Kyoto University of Foreign Studies in 1994, a M.A. in TESOL from West Virginia University in 1996. After a few years of EFL teaching back in Japan, he returned to the U.S. for the pursuit of doctoral degree in the area of applied linguistics. Recently Kota Ohata completed his dissertation and received a Ph.D. in Composition & TESOL from Indiana University of Pennsylvania.

Abstract

In light of the fact that L2 pronunciation errors are often caused by the transfer of well-established L1 sound systems, this paper examines some of the characteristic phonological differences between Japanese and English. Comparing segmental and suprasegmental aspects of both languages, this study also discusses several problematic areas of pronunciation for Japanese learners of English. Based on such contrastive analyses, some of the implications for L2 pronunciation teaching are drawn.

Introduction

The fact that native speakers of English can recognize foreign accents in ESL/EFL learners' speech such as Spanish accents, Japanese accents, Chinese accents, etc., is a clear indication that the sound patterns or structure of their native languages have some influence on the speech or production of their second language. In other words, it is quite reasonable to say that the nature of a foreign accent is determined to a large extent by a learner's native language (Avery & Ehrlich, 1992). Thus, the pronunciation errors made by second language learners are considered not to be just random attempts to produce unfamiliar sounds but rather reflections of the sound inventory, rules of combining sounds, and the stress and intonation patterns of their native languages (Swan & Smith, 1987).

Such observation of L2 pronunciation errors above, in turn, naturally suggests the critical need for ESL/EFL teachers to become more aware of the impact that learners' L1 backgrounds would bring to the learning of English pronunciation. In order to identify specific areas of pronunciation difficulties caused by L1 phonological transfer, teachers need to cultivate a firm understanding of the differences between English and the native

language of the learners.

Of course it is practically impossible for teachers working in an ESL situation as in the U.S. to understand all the phonological differences between English and the native languages of all the students, but it is also true that having such knowledge can be quite an advantage especially for teachers working in an EFL situation as in Japan.

Although contrastive analysis has often been criticized for its inadequacy to predict the transfer errors that learners will make in actual learning contexts (Whitman & Jackson, 1972), it cannot be easily denied that “such interference does exist and can explain difficulties” (Brown, 1994, p. 200), especially in the phonological aspects of second language learning. In this sense, the significance of contrastive analysis may not necessarily lie in the predictability of transfer errors, but rather in the explanatory potential of learner errors that teachers encounter in their daily practices (Celce-Murcia & Hawkins, 1985).

This paper, thus, examines some of the characteristic phonological differences between Japanese and English by focusing on segmental and suprasegmental aspects of both languages, and through comparison between the two languages, this study also points out several problematic areas of pronunciation for Japanese learners of English.

Segmental Aspects of English and Japanese

Vowels

Comparing the Japanese vowel system with that of English reveals some significant differences in the following two areas: 1) the number of vowels and 2) tense/lax distinctions.

In the English vowel system, there are 15 different vowels identified, which include several diphthongs such as /aw/, /ay/, and /oy/. On the other hand, Japanese has only 5 vowels in its vowel inventory, a system quite common among many natural languages in the world (Kenworthy, 1987). Although the number of vowels that can be identified in English and Japanese can differ depending on different analysis of linguists or phoneticians, it is obvious that there are considerably more vowels in English than in Japanese (See Table 1).

Table 1: Vowel Charts

-English-

-Japanese-

	front	central	back
high	i I		u U
mid	e ɛ	ʌ ə	o ɔ
low	æ	a	

	front	central	back
high	i		u
mid	e		o
low		a	

Another characteristic that typically differentiates the English vowel system from the Japanese vowel system is whether there exists the distinction between lax and tense vowels in either of the two systems.

The differentiation between tense and lax vowels is made according to how much muscle tension or movement in the mouth is involved in producing vowels (Ladefoged, 1982).

Thus, vowels produced with extra muscle tension are called tense, and vowels produced without that much tension are called lax vowels. For example, /i/ as in English /it/ “eat” is

categorized as a tense vowel as the lips are spread (muscular tension in the mouth) and the tongue moves toward the root of the mouth.

On the other hand, /ɪ/ as in English “it” is considered to be a lax vowel as there is little movement of the tongue or muscular tension of the lips involved in its production, compared to the manner in which the tense vowel /i/ as in “eat” is produced.

As shown in Table 1 and 2, the tense/lax vowels pairs of English such as /i/ vs. /ɪ/, /e/ vs. /ɛ /, /u/ vs. /ʊ/, do not exist in the five-vowel system of Japanese as there is no tense/lax differentiation. It should be noted, however, that although long vowels of Japanese are sometimes analyzed as having the same quality as English tense vowels, this claim is difficult to support, because those vowels of Japanese are not always contrastive in nature as the English tense/lax vowel pairs (Vance, 1987).

Consonants

As with the differences in the vowel systems, there are also noticeable differences in consonantal distributions between Japanese and English. The table 3, which shows the consonant system of each language, clearly illustrates the fact that there are more consonants in English than in Japanese (Avery & Ehrlich, 1992; Kenworthy, 1987). In the vertical column of manner of articulation, we can notice that there is no *affricate* found in Japanese. Then, looking at the horizontal column of place of articulation, there is a variety of *fricatives* and *affricates* which are much more widely distributed in English than in Japanese: /f/, /v/, /θ /, /ð/, /ʃ /, /ʒ /, /tʃ/, and /dʒ/ do not exist in the Japanese consonantal system.

Table 3: Classification of consonants according to place and manner of articulation

-Japanese-

Place of Articulation		Bilabial	Alveolar	Alveopalatal	Velar	Glottal
Manner of Articulation						
Stops	Voiceless	p	t		k	
	Voiced	b	d		g	
Fricatives	Voiceless	ɸ	s	ç		h
	Voiced		z			
Nasals		m	n			
Liquids (Approximants)			r			

-English-

Place of Articulation		Bilabial	Labiodental	Interdental	Alveolar	Alveopalatal	Velar	Glottal
Manner of Articulation								
Stops	Voiceless	p			t		k	
	Voiced	b			d		g	
Fricatives	Voiceless		f	θ	s	ʃ		h
	Voiced		v	ð	z	ʒ		
Affricates	Voiceless					tʃ		
	Voiced					dʒ		
Nasals		m			n			
Retroflex Liquid					r			
Lateral Liquid					l			

Another difference in the consonantal distribution between Japanese and English is that there exist some consonants found in the consonant inventory of Japanese but not in that of English, such as the voiceless bilabial fricative /ɸ/ and voiceless palatal fricative /ç/, as in the Japanese words “fujisann”(Mt. Fuji) and “hito”(human) respectively (Ladefoged, 1982).

Although Japanese has a liquid consonant as shown in the Table 3, the liquid does not exactly correspond to the English liquid /r/ or /l/, but rather it is considered to be an in-between sound of English /r/ and /l/. The exact articulation point is not specified for the Japanese /r/ sound.

Thus, the most characteristic difference between Japanese and English consonantal systems lies not in the number of consonants found in each of the two languages but rather in the unique distribution patterns of consonants in both languages.

Syllable Types

Comparing several words from English and Japanese can tell us some of the characteristic differences in the way that each language utilizes syllables for forming a word. Some of the examples that illustrate English syllable types are:

Word	Transcription	Syllable type
see	[siy]	C(onsonant)V(owel)
sit	[sIt]	CVC
spit	[spIt]	CCVC
spits	[spIts]	CCVCC
sprint	[sprInt]	CCCVCC

From these examples, we can say that English allows a wide variety of syllable types including both open and closed syllables: CV (open syllable), CVC CCVC, CCVCC, CCCVCC (closed syllable). On the other hand, the syllable types that Japanese allows seem to be restricted to open syllables only.

Word	Meaning	Syllable
ke	hair	CV

kare	boyfriend	CVCV
kakureru	hide	CVCVCVCV

The fact that Japanese words of more than one syllable always follow the CV-CV-CV syllable sequence clearly shows significant characteristics of Japanese syllables, which are different from those of English (Reiney & Anderson-Hsieh, 1993).

- 1) Japanese does not allow a word to end with a consonant.
- 2) Japanese does not permit both initial and final consonant clusters (i.e., CCVCC syllable).

Thus, in general, English has a wider range of syllable types than Japanese and also it allows the occurrence of consonant clusters both at the word initial and final position (Avery & Ehrlich, 1992).

It should be noted, however, that although English permits initial and final consonant clusters, there are some restrictions on the possible combinations of consonants when realized in consonant clusters. For example, the two nonsense words “blick” and “bnick” both contain initial consonant clusters /bl/ and /bn/ but the only permissible consonant combination is /bl/, not /bn/; thus native speakers of English would consider “bnick” to be a very odd word.

Suprasegmental Aspects of English and Japanese

Suprasegmental aspects of the English sound system such as rhythm, stress, and intonation are often distinguished from the segmental aspects such as consonants and vowels discussed earlier. These suprasegmental aspects of English are also considered to be different from those of Japanese in many respects.

Rhythm: Stress Timed/Syllable Timed

According to Ladefoged (1982), the term “stress-timed/ syllable-timed” is used to characterize the pronunciation of languages that display a particular type of rhythm. In stress-timed languages, there is a tendency that stressed syllables recur at regular intervals, regardless of the number of unstressed syllables that intervene in a sentence. In other words, the amount of time it takes to say a sentence in stress-timed language depends on the number of syllables that receive stress, either minor or major, not on the total number of syllables (Avery & Ehrlich, 1992).

In syllable-timed languages, on the other hand, the syllables are said to occur at regular intervals of time, and the amount of time it takes to say a sentence depends on the number of syllables in the sentence, not on the number of stressed syllables as in stress-timed languages.

According to Catford (1977), English is categorized as a stress-timed language and Japanese is a syllable-timed language. For example, it would take approximately the same amount of time to say the following two English sentences, even though the number of syllables in each sentence differs.

- Birds / eat / worms.
- The birds/ will have eaten / the worms.

1 2 3

That is, “the intervals between stressed syllables in speech are either equal or at least more nearly equal than the intervals between the nucleus of each successive syllable and next” (Matthews, 1997, p. 355). Although Vance (1987) has raised some doubts as to whether stressed syllables in English are indeed isochronal, Ladefoged (1982) notes that such a

general tendency of stress-timed languages might be applicable to English as well.

In Japanese, however, each of the equivalent sentences of English examples above would take different amount of time to complete each of the sentences;

- To/ri/ha/mu/shi/wo/ta/be/ru. (9 syllables)
- So/no/to/ri/ha/so/no/mu/shi/wo/ta/be/ta/da/ro/u. (16 syllables)

As is apparent from these examples, the amount of time to say a sentence in Japanese differs, depending on how many syllables the sentence contains, not how many stressed syllables it contains as in the English examples.

Stress: Pitch Accent Language/ Stress Accent Language

Although both English and Japanese are similar in having word stress, they differ in terms of how word stress is realized in creating characteristic stress patterns of each language. In English, stressed syllables are marked primarily by making vowels longer and louder, while in Japanese syllable stress involves simply saying vowels at a higher pitch. Such difference in stress realization between Japanese and English is often referred to as the distinction between pitch accent and stress accent languages (Gimson, 1989). The notion of stress accent seems quite relevant to the existence of reduced or unstressed vowel called “shwa” (ə) in English, for it is considered a natural phenomenon that if significantly strong stress is placed on a particular single vowel or syllable in a word, other vowels or syllables in the same word become less significant and their reduction process is facilitated. In addition, it can be said that this way of making stress greatly contributes to creating a stress-timed rhythmic pattern of English (Dalton & Seidlhofer, 1994). In contrast to English stress patterns, Japanese use of pitch in marking stress can explain the syllable timed rhythmic patterns of Japanese, in that using slightly higher pitch to mark stress does

not make a particular vowel or syllable in a word prominent in quality, compared to other vowels or syllables uttered at a slightly lower pitch. Thus, the amount of time to say a sentence in Japanese is not restricted to the number of stressed vowels or syllables as in English.

Intonation

Intonation patterns of English and Japanese have some characteristics in common such as final rising intonation pattern as used in yes-no question or final rising-falling as used in statements, commands, and wh-questions, but the difference between the two languages is the degree of pitch changes utilized in creating rising or falling intonation contours (Wong, 1987). For example, Japanese is often said to use less pitch variation than English. In other words, Japanese and English have different pitch functions in uttering a sentence. English pitch changes occur in conjunction with the major sentence stress which is usually placed on a stressed syllable in the final content word, to convey the meaning of sentences, while Japanese mainly uses pitch changes to mark stress on the word level, which results in producing a so-called “monotonous” intonation contours typical of Japanese speech patterns (Avery & Ehrlich, 1992).

Specific Problem Areas for Japanese learners of English

Pronunciation Problems: Segmentals

Segmental differences between Japanese and English sound system reveal several potentially problematic areas that Japanese learners of English encounter in their production of English consonants and vowels.

Vowels

As is pointed out in the earlier sections on the English and Japanese vowel system, there

are apparently more vowels present in English than in Japanese. The fact that the Japanese vowel inventory is characterized as a typical five-vowel system, suggests that Japanese students would have difficulty producing English vowels that do not exist in the Japanese vowel system (Vance, 1987). In English, there are five front vowels, /i/ /I/ /e/ / ε / /æ/ and five back vowels /u/ /U/ /o/ /ɔ/ /a/, while in Japanese there are only two vowels /i/ /e/ made in the front and two vowels /U/ /o/ in the back. In addition, the English central vowels /Λ/ /Ə/ do not exist in the five vowel system of Japanese. Thus, it is quite probable that vowel distinctions made by the change of tongue positioning between the five front vowels and the five back vowels of English may pose problems for Japanese learners of English, who are accustomed to making only two distinctions on tongue positioning in the front and back of the mouth.

Furthermore, the tense/lax distinctions made in English, which contribute to creating the wider variety of vowels of English, seem to be one of the most problematic areas in pronunciation for Japanese students. For example, Japanese learners often produce the tense/lax vowel pairs of English almost identically as if they were the same vowels; for example, words such as “sleep”, “taste” and “stewed” may be pronounced in the same way as such words as “slip”, “test”, and “stood” are pronounced respectively. Thus, it is quite conceivable that such failure to distinguish between tense and lax vowel pairs of English can cause misunderstandings or miscommunications between Japanese students and native English speakers. Furthermore, the Japanese lack of a mid central vowel / Λ / and a low front vowel / æ / as present in English and the different tongue positioning of the vowel /a/ between the two languages (i.e., /a/ is a low back vowel in English, while it is a low central vowel in Japanese) can bring about a great confusion to Japanese students in producing

such words as “hut”, “hat”, and “hot”, or “putt”, “pat”, and “pot”. That is, Japanese students might end up producing these three vowel sounds in such a similar or interchangeable manner that a native English speaker cannot tell which words they are trying to say.

Consonants

As I pointed out earlier, the Japanese consonantal inventory does not contain such a wide variety of consonants as its English counterpart, although allophonic realizations of some Japanese consonants can cover some of the consonants present in English but not in the Japanese consonantal system (Riney & Anderson-Hsieh, 1993; Ladefoged, 1982). Such voiceless/voiced pairs of fricatives and affricates in English as

/ʃ//ʒ/, and /tʃ/ /dʒ/ usually do not occur as distinct phonemes in Japanese, but when /s/ /z/ and /t/ /d/ appear before the vowels /I/ and /U/, they are pronounced /ʃ/ /ʒ/ and /tʃ/ /dʒ/ allophonically.

It should be noted, however, that because these allophonic realizations are constrained by the environments in which they occur, the specific settings for such Japanese allophonic realizations might not always be appropriate for English phonemic realizations (Kenworthy, 1987). For example, Japanese students may pronounce such pair of words as “sip” and “see” or “tick” and “tease” like “ship” and “she” or “chick” and “cheese” respectively. Thus, these problems are considered to be a clear illustration that Japanese students might be transferring the sound patterns of Japanese into English and producing allophonic consonants that are appropriate in Japanese but not in English.

Another problem that comes from the lack of particular consonants in Japanese but

which exist in English is the pronunciation of labiodental fricative /v/. While Japanese has a similar voiceless counterpart of /v/ sound, it is a bilabial fricative, not a labiodental as in English. Because of the particular lack of /v/ sound, Japanese learners often substitute the voiced bilabial stop /b/ for /v/. This strategy of substitution might cause some miscommunication between Japanese students and native speakers of English; for instance, such words as “vanilla” and “very” might be wrongly perceived as “banana” and “berry”.

As a similar example of substituting a particular consonant with other similar consonants available, Japanese students often employ such substitution strategy in producing the English /r/ and /l/ sounds. Although Japanese has a liquid sound similar to both English /r/ and /l/, the liquid does not exactly correspond to either of the English liquids and they are often pronounced as a kind of in-between sound of the English /r/ and /l/. Thus, Japanese students often substitute /r/ for /l/ at one time and /l/ for /r/ at another. Because of this interchangeable use of both /l/ and /r/, words such as “light” and “arrive” may sound like “right” and “alive” to English native speakers.

Still another problem of pronunciation that needs to be addressed for Japanese students is that they often have difficulty producing English words with consonant clusters and closed syllables. Such difficulty is caused by the fact that Japanese does not allow a word to end with a consonant nor permit both initial and final consonant clusters (e.g., CCVCC types of syllables as found in English words) (Avery and Ehrlich, 1992). Thus, a word with initial consonant clusters and a closed syllable such as “street” may be pronounced as “sutoreeto” or /sUtɔritɔ/, by inserting a vowel between consonants, so that the word can conform to the Japanese open syllable pattern (CV-CV). Furthermore, this vowel insertion strategy used by Japanese students seems to be a natural reaction to the difficulties

pronouncing consonant clusters, but at the same time quite difficult to amend by themselves, because usually students are not aware consciously of the fact that they are inserting a vowel between consonants in pronouncing consonant clusters. Although they might recognize the problem when pointed out by others at the time, there is no telling whether the problem will be corrected in the future.

Stress, Rhythm, and Intonation

Since Japanese is a syllable-timed language, Japanese learners of English may have difficulty producing English words and sentences in the way that corresponds to the characteristic rhythm of English. The reason behind this difficulty seems to be two fold: 1) there is no reduced or short vowel equivalent to English shwa /ə/ 2) in a syllable-timed language like Japanese, each syllable is assigned an equal amount of weight, regardless of whether the syllable is stressed or unstressed. As a result, Japanese speakers' pronunciation of English words and sentences may sound staccato-like to the native speakers' ears, and this particular type of rhythm can adversely affect the comprehensibility of their English to the native speakers. In addition, the difference in the way of stress markings between Japanese and English, also contributes to the difficulty for Japanese students in both producing and receiving the characteristic stress patterns and the overall rhythm of English.

Finally, the issue of difficulty that Japanese students might face in realizing the characteristic intonation patterns of English should also be addressed. Although both Japanese and English utilize the basic intonation patterns such as rising intonation for yes-no questions or final-rising-falling for statements in conveying the meaning of

sentences and also the intent of the speaker, the difference between the two rests not in the way of creating intonation patterns but rather in the degree of pitch change or pitch ranges employed differently in creating appropriate intonation contours in each language (Avery & Ehrlich, 1992). As a result, Japanese students would often fail to display the wider pitch range utilized in creating English intonation patterns, relying heavily on their use of the narrower pitch range of Japanese intonation patterns (MacCarthy, 1978). For example, even if a Japanese student intends to say a sentence as a statement, a native English speaker might misinterpret the statement as a question or assume that the speaker has not finished speaking yet. This example of misinterpretation as to the intent of the speaker's utterances clearly illustrates one of the most common problems that Japanese learners of English may encounter in communication. When a speaker fails to lower the pitch level far enough at the end of a sentence, the utterance might be perceived as a continuation of the speech, in spite of the speaker's initial intention to finish the line.

Furthermore, it should be noted that since pitch changes can convey not only the meaning of sentences but also the speaker's attitude toward a topic of conversation, narrower use of pitch ranges by Japanese students in their speech might be (mis)interpreted as a sign of boredom or lack of interest by the native English speakers (Avery & Ehrlich, 1992).

Conclusion

As we have seen in the preceding sections, many of the potential pronunciation difficulties for Japanese ESL/EFL learners are found to be a clear reflection of the L1 phonological transfer. Through detailed examination of Japanese and English sound

systems, some of the specific problems areas have been identified, especially in reference to some of the characteristic phonological differences between the two languages.

Pronunciation difficulties for Japanese learners of English may arise;

- 1) When they encounter sounds in English that are not part of the sound inventory of Japanese.
- 2) When the rules of combining sounds into words in Japanese are different from those in English (i.e., different syllable types).
- 3) When the characteristic patterns of stress and intonation in English, which determine the overall rhythm or melody of the language, are different from those in Japanese (i.e., pitch accent vs. stress accent and syllable-timed vs. stress-timed).

It should be noted, however, that identifying specific pronunciation difficulties for Japanese learners of English do not necessarily lead to the dramatic improvement of their pronunciation, but rather that such knowledge can only constitute a prerequisite for teachers in creating actual teaching activities. In other words, whether pronunciation teaching can become effective or not largely depends on how teachers can utilize such knowledge in designing the teaching materials or activities that help students become aware of the differences between English and Japanese sound systems and improve their pronunciation by themselves (Kelly, 2000; Celce-Murcia, Brinton & Goodwin, 1996).

Although it is almost a cliché that the better the pronunciation, the more effective the communication becomes, it is equally true that even if L2 learners could attain perfect pronunciation of separate sound items, that does not guarantee smooth communication with native speakers nor effective presentation of the ideas that they intend to convey. Communicative aspect of language learning, which involves many other competence

requirements such as grammatical, strategic, sociolinguistic, or discourse knowledge, should not be neglected for the sake of native-like accuracy of pronunciation (Morley, 1987; Celce-Murcia, 1987).

With this regard, the tasks for ESL/EFL teachers in teaching pronunciation should not be limited to eradicating all traces of a foreign accent from the students' speech. But rather, instead of expecting "precise accuracy" through tedious pronunciation drills or repetition, more emphasis should be placed on raising communicative value of the students' pronunciation, so that what they produce would be more comprehensible to others.

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