

CONTRASTIVE ANALYSIS OF THE VOWELS OF ENGLISH AND JAPANESE

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I. INTRODUCTION

1.1 Purpose

The purpose of this study is to present the sound contrasts of Japanese and English vowels in terms of a methodology of contrastive analysis, for the teaching of English to speakers of Japanese in dealing with pronunciation difficulties.

Languages are different. While this is clear and well known to anybody learning languages, it is at the same time very difficult to identify in what aspects one language differs from another and how they are different. It is also important for the teachers to find out which of these differences actually cause problems when the students are learning a foreign language. To do this task a careful study of both their target and primary languages is necessary. The fact that two languages often have many things in common should also be considered.

Two languages, such as Japanese and English, differ in many ways; such as in the way in which they arrange, symbolize, and express the world of human experiences, in their cultural, sociological and historical background. They differ, for example, in their syntactic rules, written forms, and the sound they use and the way in which they use them. All of these aspects of languages are involved in language learning, and it is important for the teachers to know about the different aspects of these differences of languages as well as the aspects which the two languages have in common. It is the purpose of this paper to discuss one such aspect — sounds — in English and Japanese so that it will be of some help to the teaching of English to speakers of Japanese.

1.2 Problem

While it seems clear that languages are different, it is also true that some of the greatest teaching difficulties come from the fact that two languages are in some ways similar to each other. For example, the /iy/ of English 'beat' is similar to the /i/ of Japanese 'ito' (thread),

but they are different, if one examines them carefully, in both their quality and their length. The difficulty with the sounds which are so similar in Japanese and English is that, without some training, the students usually do not hear the differences. And until they do hear the differences, obviously, they cannot learn to pronounce them differently.

It seems that there are two types of English sounds that cause real pronunciation difficulties :

- (1) English sounds which are similar to, but not actually the same as, certain sounds in Japanese.
- (2) English sounds which are unlike the sounds in Japanese.

It is necessary for effective teaching for the teachers to identify these difficult sounds considering the sound system of both English and Japanese.

Obviously, from the teaching point of view, it is important and necessary to contrast all the aspects of language. Phonetics is just one of the aspects that are significant in language learning. Furthermore, there are many things, within phonetics, that have to be discussed and carefully studied in contrasting two languages. This paper is limited in that it only deals with the vowels of Japanese and English. Suprasegmentals such as stress, pitch, and intonation, besides the consonants, also have to be discussed and taken into account, if the complete contrast of vowels of two languages is to be done. Allophones are also important for precise study of sounds. In this paper, however, only the simple sound contrasts of vowels in English and Japanese are presented.

1.3 Hypothesis

My hypothesis is that all English and Japanese vowels are different. Some sounds may be clearly different, while some others may be very similar. In any case, such differences (great or small) cause substitution, that is to say, "mistakes" in the target language.

1.4 Methodology

In order to present sound contrasts of Japanese and English vowels, the method of contrastive analysis is used here.

In the contrastive analysis, the target language is English and the source (primary) language is Japanese.

Tetsuya Kunihiro says that briefly speaking there are two types of contrastive analysis. One is to identify the differences between two languages and analyse them through that. Another is to find common aspects of two languages and compare them to language universals. As he says in *Nichieigo no Hikaku* (1978) and *Nichieigo Hikakukoza* (1980), both

Table 1

This study (Prator & Robinette)	Jones (Japan)	Webster's	Corresponding words
iy	i:	ē	heat
i	i	i	hit
ey	ei	ā	hate
ε	e	e	pet
æ	æ	a	hat
a	ɑ	ä	father
a	ɔ	ä	bother
ɔ	ɔ:	ó	bought
ow	ou	ō	hole
U	u	ù	put
uw	u:	ü	pool
ʌ	ə	ə	but
ay	ai	ī	height
aw	au	au	how
ɔy	oi	ói	boy

Table 2

i	い	ishi	/i / i/	(stone)
e	え	eshi	/e / i/	(painter)
ɑ	あ	ashi	/ɑ / i/	(leg)
o	お	oshi	/o / i/	(dumb)
u	う	ushi	/u / i/	(cow)

types of study are necessary and important. This study is done by the former type, identifying the differences between Japanese and English, on the basis of the vowel system in Japanese and English.

Table 1 shows some different systems for transcribing vowel sounds in English. This study employs the set of symbols about the same as the one used by C. Prator and B. Robinette (*A Manual of American English Pronunciation*, 3rd ed., New York: Holt, Rinehart and Winston, 1973,) because it is said that Prator and Robinette's symbols are helpful for foreign learners of English. Pronunciation in this study is based on what is called General American Speech.

The set of symbols commonly used in Japanese textbooks and dictionaries is usually

based on the system by Daniel Jones.

For the Japanese vowels, somewhat different symbols are used. Table 2 shows the set of symbols for the Japanese vowels in this study and their equivalents in Hiragana.

II. PHONEMICS : THE VOWELS OF ENGLISH

2.1 Phonemic Contrasts

The following contrasting vowels and diphthongs are what most Americans use in stressed syllables and those that will be discussed in this study. The phonemic symbols used here are intended only to suggest approximate phonetic qualities. Allophones of these vowels (variations according to different environments) will not be discussed in this paper.

Table 3
Symbols for English vowel sounds and
their corresponding words

1.	/iy/	beat	leak	he
2.	/ɪ/	bit	lick	
3.	/ey/	bait	lake	hay
4.	/ε/	bet	neck	
5.	/æ/	bat	lack	
6.	/a/	pot	lock	
7.	/ɔ/	bought	hawk	haw
8.	/ow/	boat	soak	toe
9.	/u/	put	look	
10.	/uw/	boot	Luke	who
11.	/ʌ/	but	luck	
12.	/ɚ/	Bert	lurk	her
13.	/ay/	bite	like	high
14.	/aw/	bout	loud	how
15.	/ɔy/	Boyd	Loyd	boy

In addition, there is an unstressed vowel (schwa) in English.

16.	/ə/	about	comma
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2.2 Preliminary Classification

The first twelve of these contrasts can be shown as follows :

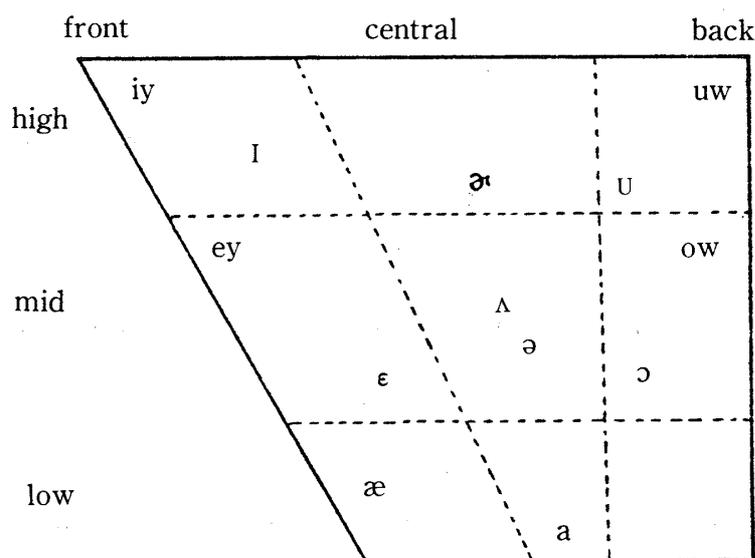


Fig. 1

Table 4

	iy	ɪ	ey	ɛ	æ	a	ɔ	ow	U	uw	ʌ	ə
vocalic	+	+	+	+	+	+	+	+	+	+	+	+
front	+	+	+	+	+	-	-	-	-	-	-	-
central	-	-	-	-	-	+	-	-	-	-	+	+
back	-	-	-	-	-	-	+	+	+	+	-	-
high	+	+	-	-	-	-	-	-	+	+	-	+
low	-	-	-	-	+	+	+	-	-	-	-	-
mid	-	-	+	+	-	-	-	+	-	-	+	-
round	-	-	-	-	-	-	+	+	+	+	-	(+)
tense	+	-	+	-	-	-	+	+	-	+	+	+

In the English vowel system, lip-rounding is not a distinctive feature. The front and central vowels of English are unrounded, and the back vowels are rounded. One should note, however, that central /ə/ as in 'her' often has considerable lip-rounding and the back vowels often have very little lip-rounding (especially lax vowels).

2.3 Tense vs. Lax

English makes only partial use of differences in muscular tension. The following examples are what considered to be "pairs" consisted of a tense vowel and its nearest lax vowel in quality.

tense		lax	
/iy/	as in <u>beat</u>	/ɪ/	as in <u>bit</u>
/ey/	as in <u>bate</u>	/ɛ/	as in <u>bet</u>
/uw/	as in <u>pool</u>	/U/	as in <u>pull</u>

The tense vowels are longer and higher (tongue position) than the lax vowels. The lax vowels are a little more centralized than the tense vowels. For /æ/ as in 'bat' and /ʌ/ as in 'but' there are no corresponding tense vowels in most forms of American English.

The distinction between tense and lax vowels is not a simple matter of the actual muscular "tension", according to P. Ladefoged. He says, in his book *A Course in Phonetics*, that the difference between the tense and lax vowels can be stated in the following way; the lax vowels /ɪ, ɛ, æ, ʌ, ʊ/ can appear in the middle of a word, but not at the end, while others, tense vowels, may appear at any place.

Examples :

tense	mid	final	lax	mid	final
/iy/	seat	see	/ɪ/	sit	—
/ey/	sake	say	/ɛ/	set	—
/uw/	suit	sue	/ʊ/	put	—
			/æ/	sat	—
			/ʌ/	but	—

2.4 Short vs. Long

In English, as mentioned in 2.3, the tense vowels /iy, ey, uw/ tend to be slightly longer than the lax /ɪ, ɛ, ʊ/. It should be noted also that there are differences in duration which are conditioned by the nature of what follows the vowel. Roughly speaking, stressed vowels are (1) short before voiceless consonants, (2) half-long before voiced consonants, and (3) long in word-final position.

Examples :

short	/liyf/	'leaf'	/kɔt/	'caught'	/rowp/	'rope'
half-long	/liyv/	'leave'	/kɔd/	'cawed'	/rowb/	'robe'
long	/liy/	'lee'	/kɔ/	'caw'	/row/	'roe'

2.5 Monophthongal vs. Diphthongal

Most vowels of No. 1—No. 12 (2.1) are usually considered to be monophthongal. The following are diphthongs in most American English :

/iy/ and /uw/ — diphthongs in some environments.

/ey/ and /ow/ — diphthongs in most environments.

/ay/, /aw/, and /ɔy/ — diphthongs in all environments.

/iy/ and /uw/ are sometimes not considered as diphthongs because the tongue movement in these two sounds is very little. Other English diphthongs are such as /ɪə/, /eə/, /ɔə/ and

/ʊə/, in which the second part has so called “r-coloring”. In diphthongs, one of the two vowel sounds usually receives stress and therefore is articulated longer and more strongly than the other. The former is called Syllabic Vowel and the latter is called Nonsyllabic Vowel. It is said that in most English diphthongs the first vowel is the Syllabic Vowel and the second vowel is the Nonsyllabic Vowel.

Fig. 2 and 3 show most of the diphthongs in General American Speech. Arrows show that the tongue keeps moving, starting from the parenthesized vowel to the circled vowel. Positions of each vowel show just approximate points. The second part of the diphthongs is said to be “the aiming point”, not the “goal”, which means that the tongue often does not reach that point, but just keeps moving toward it; so it usually does not gain full vowel quality.

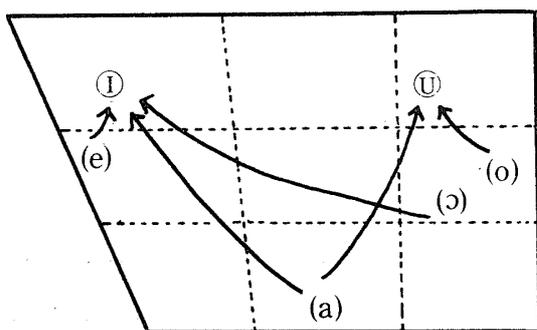


Fig. 2

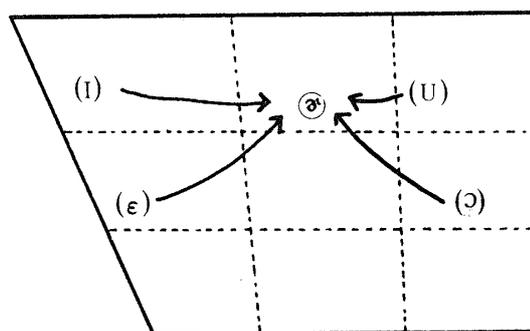


Fig.3

2.6 Unstressed Vowels

In stressed position, tense vowels are long and lax vowels are comparatively short; but in unstressed position, both tense and lax vowels are short. Also, in stressed position all standard speakers distinguish between tense and lax vowels; but in unstressed position many speakers do not distinguish between them.

In stressed position, each vowel receives full vowel quality. In the non-final unstressed (unaccented) syllables, the vowel is usually /ə/ (schwa) no matter what spelling is used for that sound.

Examples:

/ə/ spelled i — possible / pɑsəbl/

spelled a — above / əbʌv/

spelled o — common / kɑmən/

The unstressed vowels are most often /ə/, /ɪ/ or /ɛ/.

III. PHONEMICS : THE VOWELS OF JAPANESE

3.1 Phonemic Contrasts

The following contrasting vowels are what the standard speakers of Japanese usually use. The phonemic symbols used here only show approximate qualities of five ranges of Japanese vowels. Allophones of these vowels will not be discussed in this paper.

Each of the following five vowels is distinguished from one another in the initial, medial and final position of an utterance.

- | | | | | | | | |
|----|-----|---|-------------|-----|----------------|----|-------------|
| 1. | /i/ | i | (stomach) | iki | (breath) | ki | (tree) |
| 2. | /e/ | e | (picture) | eki | (station) | ke | (hair) |
| 3. | /a/ | | | aki | (fall) | ka | (mosquito) |
| 4. | /o/ | o | (tail) | oki | (off-shore) | ko | (child) |
| 5. | /u/ | u | (cormorant) | uki | (rainy season) | ku | (suffering) |

3.2 Preliminary Classification

The Japanese five vowels arranged in a structural five-vowel scheme are as follows :

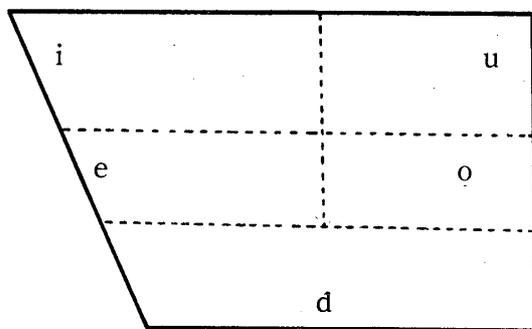


Fig. 4

Table 5

	i	e	a	o	u
vocalic	+	+	+	+	+
front	+	+		-	-
back	-	-		+	+
high	+	-	-	-	+
mid	-	+	-	+	-
low	-	-	+	-	-

/i/ and /u/ are high compared to /e/ and /o/, and /e/ and /o/ are medium compared to /a/ which is low. /i/ and /e/ are front compared to back /u/ and /o/. /a/ however, cannot be stated as front or back because there is no other low sounds to contrast with near /a/.

All the Japanese vowels appear as word initials, medials and finals.

In Japanese, two vowels are not distinguished by lip-rounding only. Back /o/ is a little rounded, and /u/ is sometimes slightly rounded.

3.3 Short vs. Long

In Japanese, the five ranges of the simple short vowels occur also as long vowels, which

are the voiced prolongation of the short vowels. The length of such long vowels is approximately two times as much as that of the shortest vowels.

The two items and utterances are consistently distinguished by the occurrence of long vowels in place of the corresponding short vowels. The short and long vowels are phonetically identical except for their length.

Examples :

'obasan'	/obasan/	(aunt)	'obaasan'	/oba:san/	(grandma)
'ojisan'	/ojisan/	(uncle)	'ojiisan'	/oji:san/	(grandpa)
'kuki'	/kuki/	(stalk)	'kuuki'	/ku:ki/	(air)
'ke'	/ke/	(hair)	'kei'	/ke:/	(sum)
'koji'	/koji/	(orphan)	'kooji'	/ko:ji/	(construction)

In Japanese speech, ei and ee are both pronounced /e:/ and ou and oo are both pronounced /o:/ most of the time.

3.5 Monophthongal vs. Diphthongal

Japanese does not have any real diphthongs. There are, however, many vowel sequences, such as two or more different vowel sequences. One may say that there is a slight diphthongization when different vowel sequences occur, but it is clearly different from diphthongization of English /ay, aw, oy/.

Examples :

'ai'	/ai/	(love)	'guai'	/gudi/	(condition)
'mae'	/mae/	(front)	'ue'	/ue/	(above)
'ao'	/ao/	(blue)	'uo'	/uo/	(fish)
'au'	/au/	(to meet)	'kui'	/kui/	(regret)

In Japanese vowel sequences, both the first and the second vowels receive about the same amount of stress and are pronounced with about equal strength and length. There is no distinction between Syllabic and Nonsyllabic Vowels as in English diphthongs.

3.6 Unstressed vowels

Unlike English, Japanese does not have unstressed vowels such as schwa /ə/. There are accented and unaccented vowels, but the difference of the qualities of those vowels is not so great. In Japanese, there is, in general, little variation in the qualities of the vowels, depending on the preceding consonant types, compared to English.

3.7 Voiced vs. Voiceless

Japanese vowels are often voiceless between two voiceless consonants.

Examples :

'kutsu' /kutsu/ (shoes) 'hito' /çito/ (man).

In this paper, such allophonic characteristics of vowels will not be discussed.

IV. CONTRASTIVE ANALYSIS : THE VOWELS OF ENGLISH AND JAPANESE

4.1 Vowel Qualities of Japanese and English

Fig. 5 shows the relations of some of the English vowels to the Japanese vowels. The diagram shows the approximate point or range of each vowel.

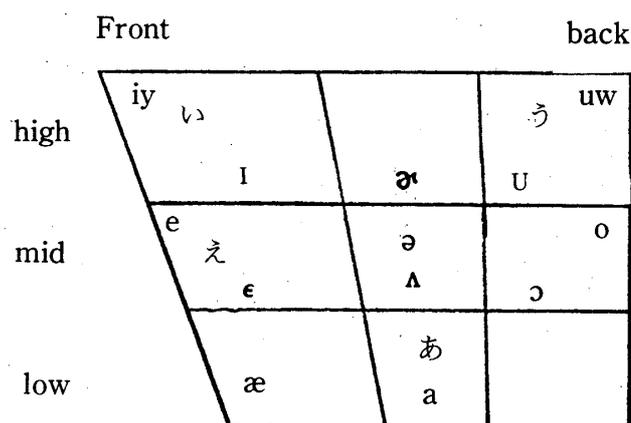


Fig. 5

From the above diagram the following can be studied: (1) Japanese has only five vowels while English has twelve, and the quality of each vowel in Japanese differs from that in English; (2) because of (1), substitution may occur between (a) the sounds similar to but not quite the same as each other in the two languages (such as $J/i/$ and $E/iy/$), (b) the sounds quite different from each other from a phonetic point of view, in articulation and auditory quality (such as $J/a/$ and $E/æ/$). However, (b) type sounds may sound similar to each other for non-native speakers ($/a/$ and $/æ/$ may sound similar or the same for Japanese students). The difference between the two sounds is greater in (b) than in (a), therefore the substitutions that occur between (b) type sounds are more likely to be greater also. This means that (b) type substitutions are more likely to be a bigger problem than (a) type ones.

Each vowel in Japanese and English will be discussed from now on.

4.2 Japanese /i/ vs. English /iy/, /I/

English /iy/ → Japanese /i:/ or /i/

'beat' /biyt/ → */bi:t/

English /I/ → Japanese /i/

'bit' /bit/ → */bit/

Although $J/i/$ and $E/iy/$ are said to be very similar in quality, they are not the same sound. For $J/i/$ the tongue stays in the same position, while for $E/iy/$ the tongue moves from a position slightly below $J/i/$ to be a position slightly above it.

$E/I/$ is a sound that does not exist in Japanese. The tongue for /I/ is lower and slightly less front than for $E/iy/$ or $J/i/$. $E/I/$ is said to be a sound somewhat between $J/i/$ and $J/e/$, but if it becomes too low, it may sound like /ε/ especially because they are both lax vowels.

Because Japanese distinguishes only between long-short and not tense-lax, the Japanese students tend to distinguish English /iy/ and /I/ only by their length, without changing the quality of sounds. Another reason for this is that the symbols /i:/ and /i/ are used by most dictionaries and textbooks in Japan. These symbols often mislead the students to think that these two sounds are identical except for their length.

Japanese students seem to have more problems with $E/I/$ than $E/iy/$ since the difference in quality of $E/I/$ and $J/i/$ is greater than that of $E/iy/$ and $J/i:/$ or $J/i/$. When substitution or underdifferentiation occurs, it sounds like English with Japanese accent, but they are usually not incomprehensible.

4.3 Japanese /e/ vs. English /ey/, /ε/

English /ey/ → Japanese /ei/ or /e:/

'lake' /leyk/ → */leik/ or /le:k/

/ey/ is diphthongized, and since the Japanese sound system does not have real diphthongs, the Japanese tend to substitute either two different vowels $J/e/ + J/i/$ → $J/ei/$ (close to the English sound, but has a Japanese accent) or long vowel /e:/ (a mispronunciation). They sometimes cause misunderstandings, sound strange to the native speakers, and are perceived as "foreign accents".

English /ε/ → Japanese /e/

'bet' /bεt/ → */bet/

$E/ε/$ and $J/e/$ are similar — they are both front mid vowels — but $E/ε/$ is lax and lower than $J/e/$. Because they are similar, it is not easy for Japanese students to identify the difference between $J/e/$ and $E/ε/$, and therefore they substitute $J/e/$ for $E/ε/$. This,

however, does not seem to cause a great problem in comprehension.

Because Japanese does not have lax vowels such as $E/\epsilon/$ or $E/I/$, people sometimes cannot distinguish $/\epsilon/$ from $/I/$ when they hear these two sounds. Some people hear both 'pin' $/p\text{in}/$ and 'pen' $/p\epsilon n/$ as the same sound.

4.4 Japanese $/a/$ vs. English $/\text{æ}/$, $/a/$, $/\Lambda/$, $/\text{ə}/$

English $/\text{æ}/ \longrightarrow$ Japanese $/a/$

'bat' $/b\text{æ}t/ \longrightarrow$ $*/bat/$

English $/\Lambda/ \longrightarrow$ Japanese $/a/$

'but' $/b\Lambda t/ \longrightarrow$ $*/bat/$

English $/a/ \longrightarrow$ Japanese $/a/$

'father' $/fa\text{ð}\text{ə}/ \longrightarrow$ $*/fa\text{ð}\text{a}/$

English $/\text{ə}/ \longrightarrow$ Japanese $/a/$

'about' $/\text{ə}b\text{a}\text{w}\text{t}/ \longrightarrow$ $*/ab\text{a}\text{u}\text{t}/$

English has many low and central vowels such as $E/\text{æ}$, a , $\Lambda/$ compared to Japanese which has only one vowel. Japanese people therefore tend to underdifferentiate these English vowels and substitute all of them with just one vowel $J/a/$. Underdifferentiation occurs not only when they produce the sound but also when they hear it.

$E/\text{æ}/$ is really an unusual sound for the Japanese and is often mispronounced as $J/a/$. But because it is so different from the Japanese sound, in a way it is easier for the Japanese to learn this sound than, for example, $E/a/$ which is so similar to $J/a/$. This, however, does not mean that the Japanese do not make mistakes after they learn this sound. When $E/\text{æ}/$ is substituted by $J/a/$ in some words such as 'bat' which has a minimal pair that is also substituted by $J/a/$, this can be a problem in comprehension.

'pan' $/p\text{æ}n/$ and 'pun' $/p\Lambda n/ \longrightarrow$ $*/pan/$

'lack' $/l\text{æ}k/$ and 'luck' $/l\Lambda k/ \longrightarrow$ $*/lak/$

Japanese people very often cannot hear the vowel $E/\Lambda/$ and tend to substitute $J/a/$ for $E/\Lambda/$, as shown above. $E/\Lambda/$ and $J/a/$ are unlike each other (mid vs. low), but some allophones of $J/a/$ may be similar to $E/\Lambda/$.

$E/\text{ə}/$ is also often pronounced as $/a/$ when the spelling of $E/\text{ə}/$ is a. This does not lead to serious misunderstandings but may lead to a foreign accent.

'above' $/\text{ə}b\text{a}\text{v}/ \longrightarrow$ $*/ab\text{a}\text{v}/$

'comma' $/k\text{ə}m\text{ə}/ \longrightarrow$ $*/k\text{a}m\text{a}/$

$E/a/$ is almost always substituted by $J/a/$. Because these two sounds are quite similar to

each other, it is very hard for the Japanese to correctly pronounce $\text{E}/a/$, but this usually does not cause communication difficulties.

'pot' /pat/ → */pat/

The Japanese are often greatly influenced by the spelling. One of the reasons for this is probably the Japanese writing system. In Japanese writing, one vowel (Hiragana) usually corresponds to one sound; 'あ' /a/, 'い' /i/ and so on. The Japanese tend to apply this Japanese system to English and mispronounce some of the English vowels. The following are among those frequently mispronounced by the Japanese.

'lock' /lak/ → */lok/

'pot' /pat/ → */pot/

The Japanese tend to pronounce $\text{E}/a/$ as $\text{J}/o/$ when it is spelled with o.

These underdifferentiations and substitutions sometimes cause big problems in comprehension.

4.5 Japanese /o/ vs. English /ɔ/, /ow/

English /ɔ/ → Japanese /ou/ or /o: /

English /ow/ → Japanese /ou/ or /o: /

It is very hard for the Japanese to distinguish these two sounds. People often pronounce both 'bought' /bɔt/ and 'boat' /bowt/ the same way, /bout/ or /bo:t/ (more commonly /bo:t/).

'bought' /bɔt/ → */bo:t/

'boat' /bowt/ → */bo:t/

People are sometimes misled by the spelling.

'bought' /ɔ/ → */bout/

'boat' /ow/ → */bo:t/

The word 'boat' is a loan word in Japanese and it is written with Katakana as 'ボート' /bo:to/. This is another important cause of mispronunciation. Other examples for this are: 'コート' /ko:to/ (coat), 'ショー' /ʃo:/ (show), 'ソープ' /so:pu/ (soap).

4.6 Japanese /u/ vs. English /U/, /uw/

English /uw/ → Japanese /u: /

'boot' /buwt/ → */bu:t/

English /U/ → Japanese /u/

'put' /put/ → */put/

Most Japanese students tend to pronounce English /uw/ and /U/ both with their

Japanese /u/ or /u:/ sounds (substitution). As shown before, $E/uw/$ and $E/U/$ are different from each other in the quality, and they are both different from $J/u/$. $J/u/$ is more centralized (tongue position) than $uw/$, and higher than $E/U/$. While the Japanese only sometimes (according to the environment and accent), and only slightly, round the lips for $J/u/$, English speakers usually round their lips more for their $E/uw/$.

Many Japanese students differentiate 'pool' and 'pull' or 'fool' /fuwl/ and 'full' /fU/ only by their length. This may cause some communication problems in speaking with American students.

4.7 English /ɝ/

English /ɝ/ → Japanese /ɑ:/ or long vowels

'girl' /gɝl/ → */gɑ:l/

Japanese has no sound like $E/ɝ/$ that has /r/ after a vowel and before a consonant.

Therefore, Japanese speakers tend to omit /r/ and instead, just substitute it with /ɑ:/ or give the time value of a long vowel. The same thing happens with other vowel-/r/ sequences.

'bar' /bɑɝ/ → */bɑ:/

'four' /fɔɝ/ → */fo:/

/ɝ/ is sometimes pronounced as /ɑ/.

'for' /fɔɝ/ → */foɑ/

'care' /kɛɝ/ → */keɑ/ or */keɑ:/

These sounds usually sound strange to the Americans and they are sometimes incomprehensible.

4.8 Diphthongs

English /ay/ → Japanese /ɑi/

'eye' /ay/ → */ɑi/

English /aw/ → Japanese /ɑu/

'how' /haw/ → */hɑu/

English /ɔy/ → Japanese /oi/ or /o:i/

'oil' /ɔyl/ → */oil/

'boy' /boɪ/ → */bo:i/

There is no diphthongs in Japanese, although there are similar vowel sequences (such as /ɑi/ 'love', /oi/ 'nephew'). This has been discussed in 2.5 and 3.5. The speakers of Japanese therefore do not diphthongize these English sounds, but substitute two independent Japanese vowels for English diphthongs. In such substitutions both vowel sounds are given the same

(or almost the same) time value and quality. This is one of the main causes of 'Japanese Accent' and it sometimes causes communication problems.

Contrasting Chart

From the study above, one can predict the points at which Japanese students seem to have difficulties. The following shows the vowel contrasts in Japanese and English.

Table 6

J/i/	J/i:/	J/e/	J/e:/	J/a/	J/a:/	J/o/	J/o:/	J/u/	J/u:/
い	いい	え	ええ	あ	ああ	お	おお	う	うう
E/I/ E/iy/	E/iy/	E/ε/	E/ey/	E/a/ E/ʌ/ E/æ/ (E/ɚ/)	E/ɚ/ E/aɚ/	E/ɔ/ E/ow/	E/ɔ/ E/ow/	E/U/ (E/uw/)	E/uw/ (E/U/)

4.10 Other Problems

There are many other problems and difficulties the students face in learning English as a foreign language. To discuss those problems, "suprasegmentals" of both Japanese and English have to be studied and compared. Things such as syllable vs. mora and stress vs. accent have to be discussed in order to actually study how Japanese (accent pattern or mora) interferes with English in speech. Although suprasegmentals are not mentioned in this study, they are very important elements that have to be considered in a complete contrastive analysis of sounds.

V. CONCLUSION

From the contrastive analysis of vowels of English and Japanese, the following things are found: (1) because Japanese has only five vowels while English has sixteen (including some of the diphthongs and unstressed schwa), Japanese speakers underdifferentiate the English sounds; but (2) because all the Japanese vowels are different from English ones, they not only underdifferentiate but also "substitute" the Japanese sounds for the English sounds that to them seem similar. The feature common to the mispronunciation of typical Japanese students is the fact that they substitute for English sounds the corresponding sounds of Japanese. There are many reasons for this: (1) a student may not be able to hear the difference between two similar sounds and simply substitute the Japanese sound for the

English sound ; (2) he may be able to hear the English sound, but because he is unfamiliar with the sound, he may not be able to produce the same sound ; (3) he may make substitution which is based not on the sound but on spelling ; or (4) he may be misled by the loan words in Japanese which are written in Katakana or Hiragana.

For whatever reason the substitutions are made, it is these substitutions of Japanese sounds for English sounds which lead the students to mispronounce English words.

Teachers of English to speakers of Japanese, therefore, must understand the sound substitutions which cause them so that they can correct such mispronunciations. And for that, they should know not only the sounds of English but also as much as possible about the Japanese sounds which the students substitute, and should know how these substitutions are made. To know about these, "contrastive analysis" of the sounds of English and of Japanese is necessary. It is the purpose of this paper to actually list the vowels of Japanese and English and then to contrast them one by one, so that this study may be of some help to teaching English to speakers of Japanese.

When one listens to foreign students speaking English, usually he can tell which country they came from. Most people who learn English as a second language have native language interference in their speech. This is true of the Japanese students also. One can tell as soon as he hears a Japanese student speak, that he is a Japanese. One of the reasons for this is of course that he has interference from Japanese. Another reason that is often overlooked is his previous schooling. Many Japanese schools have not put much emphasis on Phonetics. The teachers know that English sounds are different from the Japanese sounds, but they often do not know "how" English sounds differ from Japanese sounds, or "how to correct" mispronunciations. It seems natural that students who had such schooling cannot pronounce English sounds properly. It is my hope that this kind of contrastive study will be of some help to teachers of English.

However, this paper only deals with one task — identifying and explaining the students' pronunciation difficulties through contrastive analysis. To actually apply this to teaching, correcting such difficulties once they have been identified using the result of this study in actual teaching, is beyond the scope of this paper. Such a task must be done by well-trained, experienced teachers of English.

Finally, one should not forget that there is no 'perfect' pronunciation. There are at least two reasons for this. One is that it is very difficult (or almost impossible) for a person over a certain age to gain a native speaker's pronunciation. Another reason is that any language has many dialects (within itself) and none of those dialects should or can be chosen as the only 'correct' pronunciation. There is General American Speech in American English, but it does

not mean that other dialects are 'wrong'.

The most important thing is to realize that language is a device of communication. Phonetics is one of the necessary elements for better communication. Both teachers and students should keep this in mind in teaching and learning a foreign language.

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