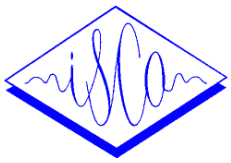

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THE DURATIONS OF JAPANESE LONG VOWELS AND GEMINATED CONSONANTS UTTERED BY INDONESIAN

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ABSTRACT

This research was conducted to measure the durations of Japanese long vowels and geminated consonants uttered by Indonesian and Japanese speakers, and compared with the values. The rusults showed that it is difficult even for the fluent speakers of Japanese to utter the long vowels and geminated consonants correctly.

I. INTRODUCTION

The duration of syllable or mora in Japanese plays an important role for its rhythmic structure. It is rather difficult for most learners of Japanese to pronounce Japanese smoothly, because the syllabic(or moraic) duration is almost equal. Especially when they pronounce Japanese long vowel and moraic consonants, they have a tendency not to keep enough length of time, and cosequently to break the rhythmic structure of Japanese.

Concerning to the Japanese long vowels and moraic consonants, their durations were investigated from the view-points of production and perception [1], [2]. And the reality of the mora was discussed from measuring of the durations of 'moraic first part' of a long consonant and syllables [3], [4], [5].

In this research, we examine the durations of Japanese long vowels and geminated consonant uttered by Indonesian and Japanese, and compare Indonesian speech samples with Japanese ones.

II. EXPERIMENT I

Japanese long vowel consists of two morae, and it is considered that the syllables containing long vowels are about twice as long as a syllable. In this experiment, we confirm this fact by measuring the durations of long vowels uttered by Japanese speakers, and examine how Indonesian, who don't have long vowels in their language, utter them from a viewpoint of the length of time.

2.1 Method

We selected six word-pairs which contained the contrasting long and short vowels. The list of these word-pairs is as follows,

kaasan (mother):kasa (umbrella)
kiite (listen to):kite (come)
kuuro (by air):kuro (black)
seeto (pupil):seto (name of person or place)
tooku (far):toku (profit)
obaasan (grand mother):obasan (aunt)

In this list, each of five selected word-pairs were read in the same sentence. An example is next sentence;

Kokoni kite utao kiite kudasai.
(Come here and listen to the song.)

The informants were two Japanese and two Indonesian male speakers. Indonesian informants have been staying in Japan for five years and can speak Japanese fluently. The informants were asked to read the sets of words and

sentences naturally after exercising of utterence. The recordings were made in a sound-proof booth. The durations of contrasting CVV and CV syllables in the word-pairs were measured on the digitized waveform display using a computer-controlled cursor.

2.2 Results and Discussion

It is impossible to measure the duration of second vowel in CVV directly, therefore we estimated it as the difference of syllabic durations [DSD] between CVV and CV of contrasting words. We also calculated the ratio of syllabic durations between CVV and CV. The results obtained here are shown in Table 1.

In the (a) of Table 1, we can find that the durations of second vowel[DSD] in CVV syllables from all informants maintain the length of a mora, and the mean values of ratios from Japanese informants are more than 2, but those from Indonesian informants are less than 2. In the (b) of Table 1, except BA, the values of DSD become short but the mean values of ratios from Japanese are near 2 and those from Indonesian are less than 2. These results show that Japanese have the sence of mora in utterence of the long vowels, but Indonesian informants fail to learn the sence of mora.

III. EXPERIMENT II

Japanese geminated consonant isn't uttered alone, but is uttered together with a vowel and following consonant. And it is considered that it maintains the length of the mora. In this second experiment, we verify this fact in connection with the forward syllable, and examine the utterence of the geminated consonant by Indonesian, who have the geminated-like consonant in some cases. An example is as follows,

meledak (explode)→meledakkan (explode somethig)

TABLE I. Differences[DSD](msec) and ratios of durations between CVV and CV in each pair.

INFORMANT	JAPANESE				INDONESIAN			
	TA		SA		BA		SU	
PAIR	DSD	RATIO	DSD	RATIO	DSD	RATIO	DSD	RATIO
kaasan:kasa	99	1.87	110	1.85	92	1.50	94	1.70
kiite:kite	148	2.61	167	2.53	136	1.98	50	1.43
kuuro:kuro	156	2.33	171	2.41	149	2.00	140	2.16
seeto:seto	133	1.80	189	2.28	165	1.85	125	1.88
obaasan:obasan	92	1.60	118	1.76	89	1.39	90	1.57
x	127	2.04	151	2.17	126	1.74	100	1.75
(a) Isolated words								
kaasan:kasa	65	1.64	68	1.73	162	1.85	83	1.74
kiite:kite	104	2.60	54	1.59	102	1.89	42	1.51
tooku:toku	59	1.70	81	2.17	147	1.94	36	1.37
seeto:seto	108	1.99	83	1.65	122	1.62	71	1.40
obaasan:obasan	100	1.82	122	2.23	57	1.21	44	1.29
x	87	1.95	82	1.87	118	1.70	55	1.46
(b) Words in sentences								

3.1 Method

We selected nine word-pairs which contained the contrasting geminated and short consonants. The list of these word-pairs is as follows,

itta (went):ita (existed)

ikki (at a stretch):iki (breath)

akka (bad coin):aka (red)

katta (won):kata (shoulder)

kakki (vigor):kaki (fence)

kitte (stamp):kite (come)

kakko (parenthesis):kako (past)

satte (gone):sate (well)

sakka (writer):saka (slope)

In this list, each of three selected word-pairs were read in the same sentence. An example is next sentence;

Ano sakka no iewa saka no ueni aru.

(That writer's house is at the head of an uphill.)

The informants are same as in experiment 1. The durations of contrasting CVC and CV syllables in the word-pairs were measured on the digitized waveform display. An example is shown in Fig.1.

Fig.1 Examples of speech waveforms "kakko" and "kako".

TABLE II. Differences of closure durations[DCD](msec) and ratios of durations between (C)VC and (C)V in each pair.

INFORMANT	JAPANESE				INDONESIAN			
	TA		SA		BA		SU	
	DCD	RATIO	DCD	RATIO	DCD	RATIO	DCD	RATIO
PAIR								
itta:ita	159	2.14	111	1.88	90	1.59	98	1.66
ikki:iki	125	2.06	88	1.83	196	2.26	106	1.35
akka:aka	210	2.59	121	1.83	182	2.52	93	1.69
katta:kata	123	1.54	103	1.50	141	1.50	105	1.43
kakki:kaki	145	1.80	157	1.92	184	1.84	67	1.31
kitte:kite	208	2.35	107	2.02	131	1.74	90	1.36
satte:sate	166	1.84	131	1.71	87	1.46	111	1.40
sakka:saka	209	2.16	117	1.89	144	1.74	106	1.39
x	168	2.06	117	1.82	144	1.83	97	1.45
(a) Isolated words								
kitte:kite	137	2.35	106	2.87	140	2.02	140	2.17
kakko:kako	79	1.67	82	1.70	107	1.81	101	1.72
sakka:saka	102	1.67	76	2.30	54	1.28	61	1.28
x	106	1.90	88	2.29	100	1.70	101	1.72
(b) Words in sentences								

3.2 Results and Discussion

We estimated the duration of geminated consonant as the difference of the closure durations[DCD] between CVC and CV of contrasting words. We also calculated the ratio of the syllabic durations between CVC and CV. The results obtained here are shown in Table 2.

As can be seen from the (a) of Table 2, the durations of geminated consonant[DCD] in CVC syllables from all informants (one exception;67ms) maintain the length of a mora. The values of ratios from Japanese informants are near 2 (three exceptions;1.71,1.54,1.50), but those from Indonesian informants are less than 2 (three exceptions from BA;2.52,2.26,1.84). In the (b) of Table 2, the values of DCD from Japanese informants become short, but the mean value of ratios are near 2. Both the values of DCD and ratio from Indonesian informants are widely variable. These results show that the geminated consonant consists of a mora, and one Indonesian informant is familiar with the utterence of geminated consonants.

IV. CONCLUSION

We measured the durations of Japanese long vowels and geminated consonants uttered by Indonesian and Japanese. These results indicate that it is important for learners of Japanese to acquire the sence of mora in order to speak Japanese naturally.

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