TEACHING JAPANESE BI-MORA AND QUADRIC-MORA TIMING RHYTHMS TO VIETNAMESE LEARNERS

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ABSTRACT

Speech rhythm in Japanese is based around a unit of timing known as the mora. In this study, the Haiku, a Japanese poetic form, is used to help Vietnamese learners of Japanese improve their speech rhythm or, more specifically, their mora-timing, by using bi- or quadric-mora-timing as a pedagogic strategy. Following instruction, participants in the study showed improvement in the uniformity of the duration of individual morae produced, indicated by the range of standard deviation scores, and also improved in speed and fluency. This effect persevered when learners were tested a week later.

Keywords: Japanese speech rhythm, mora timing, musical conducting method, pronunciation, Haiku

1. INTRODUCTION

This study looks at how the Haiku, a Japanese poetic form, can be used to help Vietnamese learners of Japanese improve their speech rhythm or, more specifically, their mora-timing, by using bi- or quadric-mora-timing as a pedagogic strategy.

2. SPEECH RHYTHM IN JAPANESE

2.1. The mora

Speech rhythm in Japanese is based around a unit of timing known as the mora, with each mora taking roughly "the same length of time to say" [5]. Collins and Mees [4] explain that "the typical Japanese CV syllable (e.g. *na*) is regarded as a single mora", and how syllables with two vowels (including a lengthened vowel) and those containing the final mora nasal /N/ contain two morae (e.g., *mai*, *juu*, *dan*). Words of more than one syllable may also contain a mora obstruent [8], represented as /Q/, which means that certain word-internal obstruent consonants are perceived as long; in, e.g., *happa* ("leaf"), the bilabial plosive is held after the closure phase for roughly the duration of a mora before being released, resulting in [hɐpːɐ], which is three morae [8].

2.2. Bi- and quadric-mora-timing

Japanese rhythm is generally believed to be mora-timed, and foreign learners working on Japanese pronunciation learn mora-timing as part of this process. However, it is often the case that learners' mora-timing still does not sound very natural to teachers of Japanese or native speakers (NSs).

In fact, recent discussion suggests that describing Japanese as mora-timed in simple terms is inadequate. Bekku [3] and Sakano [6], for example, suggest that Japanese is not just mora-timed but bi-mora and/or quadric-mora timed; i.e., morae need to be produced in groups of two or four in order to sound natural. It is further suggested that Japanese listeners parse sentences according to these patterns, regardless of morphological constraints [3, 6]. If the pattern is different, then it will not sound "natural".

Let us take the Japanese poetic form of the Haiku as an example. A Haiku is typically represented as consisting of a five-mora first line, a seven-mora second line and a five-mora third line. Bekku [3] and Sakano [6], however, argue that each line of a Haiku consists of eight mora spaces; this can be achieved if the first and third lines have three rest spaces and the second line has one rest space at the end; the rest spaces can sometimes be in the middle depending on the phrase boundary. This gives each line the same total duration, and is a pattern mirrored in non-poetic Japanese. Typically, a Haiku is analysed in terms of morae as given in example (1):

(1) Haiku 1
1 2 3 4 5
ka-ki-ku-e-ba (As I eat a persimmon)
1 2 3 4 5 6 7
ka-ne-ga-na-ru-na-ri (the bell rings)
1 2 3 4 5
ho-o-ryu-u-ji ([at] the Horyuji Temple)

However, if rest spaces indicated as "μ" are added, the analysis is given as in example (2):

(2)
1 2 3 4 5 6 7 8
ka-ki-ku-e-ba-μ-μ-μ

1 2 3 4 5 6 7 8
ka-ne-ga-*μ*-na-ru-na-ri
1 2 3 4 5 6 7 8
ho-o-ryu-u-ji-*μ*-*μ*-*μ*

Bekku [3] and Sakano [6] then assert that each eight-mora line can be analysed as consisting of four two-mora "feet", as in (3), or two four-mora "feet", as in (4) in which each foot is one beat in the line:

(3) [[*μ μ*][*μ μ*][*μ μ*][*μ μ*]]
(4) [[*μ μ μ μ*][*μ μ μ μ*]]

By analogy, Abercrombie [1] mentions the existence of "silent stress" in English poetry and, with Aitken and McIntosh [2], refer to "some functions of silent stress", as in the following:

(5)
A ˈflea and a ˈfly in a ˈflue [ˈBEAT],
Were ˈtrapped and knew ˈnot what to ˈdo [ˈBEAT].
Said the ˈfly , 'Let us ˈflee',
'Let us ˈfly', said the ˈflea,
So they ˈflew through a ˈflaw in the ˈflue [ˈBEAT].

2.3. The current study

The first author, a Japanese NS, currently teaches Japanese to Vietnamese learners at Lomonoxop School in Hanoi once a year and has found that their Japanese does not sound very natural in terms of rhythm, in spite of the fact that they succeed in producing morae with similar duration; i.e., they succeed in performing mora-timing.

To remedy this situation, it was decided to apply bi-mora- and quadric-mora-timing in pronunciation classes, using Haiku as a medium. This was taught to the Vietnamese learners by the first author using a musical conducting method, in which the rhythmic foot as shown in examples (3) or (4) is indicated by waving one's hand rhythmically like a musical conductor.

Pilot study data showed that, by learning bi-mora timing, the learners showed variation in the uniformity of the duration of individual morae produced, indicated by the range of standard deviation scores [7]. However, by learning quadric-mora timing, learners improved in uniformity. However, the same Haiku was used in the training and in the test conditions, so it is possible that increased exposure to and practice of this Haiku were a contributing factor (i.e., there may have been a learning effect).

3. METHODOLOGY

To test whether the method is effective when different Haiku are used in the training and in subsequent tests, the present study used two Haikus. One was used to train the learners in bi- and quadric-mora timing, and the other was used to test whether the effect could be generalized to a different Haiku in order to avoid the possibility of learning effect.

Eight ninth-grade learners (i.e., about 14 years of age) who had been studying Japanese as a subject at Lomonoxop School in Hanoi, Vietnam for three years took part in the experiment. Each Haiku was presented to the learners in both romaji (Romanization) and Japanese hiragana characters. Haiku 1, presented here in romaji, is given as example (1); the second is as follows (6):

(6) Haiku 2
fu-ru-i-ke-ya-*μ*-*μ*-*μ* (An old pond)
ka-wa-zu-*μ*-to-bi-ko-mu (A frog jumps in)
mi-zu-no-*μ*-o-to-*μ*-*μ* (The sound of water)

In the training condition, learners produced Haiku 1 three times: once without instruction (referred to here as the mono-moraic reading), once after instruction on bi-mora-timing and with the first author guiding learners with gestures which indicated each bi-moraic unit, and finally after instruction on quadric-mora-timing with the first author guiding learners with gestures which indicated each quadric-moraic unit. A week after that, for the testing condition, the learners were required to produce Haiku 2 twice, in bi- and quadric-mora timing, without any further instruction.

Each learner was recorded individually in the classroom using a Roland Edirol R-09HR recorder with the settings at 44.1kHz, 16 bit stereo. We then used WASP to calculate the duration of each mora.

4. RESULTS AND ANALYSIS

4.1. The training condition

The results from the training condition using Haiku 1 (1) are given below in Tables 1, 2 and 3, which show the average duration in milliseconds (ms) for the raw scores of each mora, as well as standard deviation scores for each mora and an average duration across all morae in each line and in total.

The results show that, in the first, non-tutored performance of Haiku 1, the learners showed considerable variation in the uniformity of the duration of individual morae produced, indicated by the standard deviation scores, i.e., from 30.2 for the

mora *ji* (じ) to 67.5 for *na* (な), as shown in Table 1 (StDev range = 37.3). The range in duration of morae is 111ms (210ms – 321ms).

Table 1: Average durations (in ms) of morae in the mono-moraic reading, Haiku 1, training condition

	ka	ki	ku	e	ba			Av
Av	229	270	292	292	321			281
SD	50.9	43.4	55.6	40.4	47.5			
	ka	ne	ga	na	ru	na	ri	
Av	247	292	286	266	253	258	277	268
SD	63.2	54.5	64.8	67.5	52.4	45.3	39.1	
	ho	o	ryu	u	ji			
Av	241	210	289	230	250			244
SD	57.7	64.5	59.8	54.4	30.2			
							All	264.9

Table 2: Average durations (in ms) of bi-mora feet in the bi-moraic reading, Haiku 1, training condition

	ka	ki	ku	e	ba			Av
Av	183	214	210	224	250			216.3
SD	50.8	37.7	58.5	45.3	72.3			
	kai	ne	ga	na	ru	na	ri	
Av	188	256	250	224	214	191	230	221.7
SD	47.8	46.3	80.3	44.4	46.7	67.6	37.8	
	ho	o	ryu	u	ji			
Av	187	205	184	221	205			200.4
SD	48.4	48.9	63.3	72.4	63.6			
							All	213.8

Table 3: Average durations (in ms) of quadric-mora feet in the quadric-moraic reading, Haiku 1, training condition

	ka	ki	ku	e	ba			Av
Av	172	175	148	143	277			183
SD	56.6	55.3	56	57.8	132			
	ka	ne	ga	na	ru	na	ri	
Av	195	211	267	175	170	178	193	198.4
SD	65.2	72.3	82.2	60.9	60.9	51.9	42	
	ho	o	ryu	u	ji			
Av	148	147	147	145	203			157.8
SD	32.1	34.5	33	38.9	43.3			
							All	179

By learning bi-mora timing (Table 2), the uniformity seems to have slightly decreased, indicated by the widening in range of standard deviation scores, i.e. from 37.7 for the mora *ki* (き) to 80.3 for *ga* (が) (StDev range = 42.6). However, the range in duration of morae has decreased to 73ms (183ms – 256ms).

By learning quadric-mora timing, learners seem to have further decreased in uniformity (Table 3); the standard deviation ranged from 32.1 for the mora *ho* (ほ) to 132 for *ba* (ば) (StDev range = 99.9). In addition, the range in duration of morae has increased in comparison with both the mono- and bi-moraic condition to 134ms (143ms – 277ms).

Speed of production improved over the three readings; the average duration of all morae in the mono-moraic condition was 264.9ms (shown in Table 1 as "All"), whereas in the bi-moraic condition it was 213.8ms (Table 2) and in the quadric-moraic condition it was 179ms (Table 3). This could, however, be attributed to learning effect, i.e., general familiarity with Haiku 1 by the end of the training.

We considered whether to disregard the scores for the final mora in each line in the overall average, as morae in this position may be subject to phrase-final lengthening. In the bi- and quadric-moraic conditions, they each appear at the beginning of a foot with additional morae following. However, as they were not always the longest morae in each line, it was decided to include them in the average calculations.

4.2. The testing condition

Tables 4 and 5 present the data from the testing condition using Haiku 2 (6).

Table 4: Average durations (in ms) of mora in the bi-moraic reading, Haiku 2, testing condition

	fu	ru	i	ke	ya			Av
Av	200	193	189	224	239			208.8
SD	16.9	26.6	19.5	46.3	40.4			
	ka	wa	zu	to	bi	ko	mu	
Av	228	242	303	188	188	199	208	222.3
SD	48.4	52.3	45	40.2	43.8	38.6	51.7	
	mi	zu	no	o	to			
Av	241	257	243	205	201			229.4
SD	49.4	54	44	28.4	16.1			
							All	220.4

Table 5: Average durations (in ms) of mora in the quadric-moraic reading, Haiku 2, testing condition

	fu	ru	i	ke	ya			Av
Av	184	182	178	240	249			206.5
SD	30.5	32.8	26.4	34.2	41.9			
	ka	wa	zu	to	bi	ko	mu	
Av	194	194	224	169	170	168	177	184.9
SD	29.8	35.3	55.2	25	24.8	20.4	27.5	
	mi	zu	no	o	to			
Av	178	181	210	174	176			183.6
SD	48	41.1	51.4	32.9	20			
							All	190.9

The results show that uniformity of the durations of morae improved in Haiku 2. In the bi-moraic condition (Table 4), the standard deviation scores range from 16.1 for the mora *to* (と) to 54.0 for *zu* (ず) (StDev range = 37.9). The range in duration of morae is 114ms (189ms – 303ms). These scores are

not dissimilar from the mono-moraic condition (Table 1).

The uniformity of the duration of mora produced in quadric reading (Table 5) also improved, as indicated by the range of standard deviation scores, i.e., from 20 for the mora *to* (と) to 55.2 for *zu* (ず) (StDev range = 35.2). The range in duration of morae is 81ms (168ms – 249ms).

Speed of production improved over the two readings; the average duration of all morae in the bi-moraic condition was 220.4ms (Table 4) and in the quadric-moraic condition it was 190.9ms (Table 5). These were not an improvement on the readings during the training condition, however. Again, the increase in speed from the bi-moraic to the quadric-moraic conditions could be attributed to learning effect, i.e., increased familiarity with Haiku 2 in the last reading.

As in the training condition, the final morae in each line were not always the longest, and therefore not particularly subject to phrase-final lengthening, so it was decided to include them in the calculations.

5. DISCUSSION

Even though there was no consistent improvement in any parameter other than overall speed of production in Haiku 1, uniformity of production of each mora in Haiku 2 – the object of the training – was much more consistent and therefore improved. We suggest this shows that training in bi- and quadric-mora timing, although not obviously effective at the time of training, works well as a pedagogic strategy when applied to Haiku and shows evidence that learning from both methods could be generalised by the learners to new material.

6. NATURALNESS RATINGS

In order to test how natural the learners sound to NSs of Japanese, a survey was conducted using 73 Japanese listeners who were undergraduate students at a university in Japan, aged 18-21 years. They were asked to judge the naturalness of each Vietnamese learner's production on a scale of 1 to 5, 1 being the least natural-sounding and 5 being the most natural-sounding. The readings were played to them in random order. The results are given in Table 6.

According to the survey, the Vietnamese learners improved in naturalness of Japanese rhythm considerably. We would also like to suggest this is a positive effect of the training.

Table 6: Average naturalness ratings for the Vietnamese learners as judged by Japanese NSs.

		Score
Haiku 1	Mora-timing	2.7
Haiku 1	Bi-mora timing	3.04
Haiku 1	Quadric-mora timing	3.07
Haiku 2	Bi-mora timing	3.16
Haiku 2	Quadric-mora timing	3.85

6. CONCLUSION

From the results presented above, training Japanese speech rhythm in bi- and quadric-morae using a musical conducting technique seems to be effective; both speed and uniformity of production improved, and the subjects sounded significantly more natural to Japanese NS listeners. The next steps in this line of research are to conduct an experiment using the same method but with three groups of subjects, i.e., two groups of learners (control and test groups), and a group of native speakers of Japanese for comparison, and also to use different Haiku at every stage in order to minimise an increase in speed owing to familiarity with a particular Haiku.

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