



The Effects of the Nasal Duration and the Position of the Moraic Nasals on the Perception of /N/: A Study of TJJL2

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Abstract

This study aims to examine how the nasal duration and the position of the moraic nasals would influence the learners' perception of Japanese moraic nasals (/N/).

The subjects of the study are seventy-two university learners who are learning Japanese as a second language in Taiwan (TJJL2). Fifty-four of the subjects have passed Japanese-Language Proficiency Test level N1-N2, while the other subjects are with the Japanese proficiency level between N3-N5.

Through the test of this study, we can also understand if learners with different Japanese proficiency levels would have different patterns in perceiving Japanese moraic nasals.

The results were shown as follows:

1. The moraic nasals in the final position were perceived with shorter nasal duration.
2. The learners with higher Japanese language proficiency perceived the moraic nasals with shorter nasal duration.
3. The manner of articulation might be more crucial than the nasal duration when the moraic nasal is not adjacent to a nasal sound.

Keywords: learning the Japanese language as a second language, moraic nasals, nasal duration

1. Introduction

Rhythmic characteristics of the Japanese language have been proved difficult for learners of Japanese as a second language [1], not only in production but also in perception [2]. Previous research indicates that the perception of moraic nasals is learned earlier than the production of moraic nasals [3]. In order to develop better production of moraic nasals, it is important to examine how learners perceive the moraic nasals.

Previous studies of the perception of Japanese moraic nasals have shown that the nasal duration is crucial in perceiving Japanese moraic nasals [3]. The vowel duration preceding the moraic nasals also influences the perception of the native speakers, but shows no influence to Chinese learners. As for

learners with different Japanese language proficiency, the previous study [5] indicates that the learners with lower Japanese proficiency need longer nasal duration to perceive the moraic nasals.

However, all the subjects in the previous studies are either native speakers of the Japanese language or Chinese learners, and the factors used in the perception test are the nasal duration and the preceding vowel duration. As for the stimuli, the moraic nasal in each stimulus is all in the middle position and adjacent to a nasal sound.

With this background in mind, the goals of this study are to examine the influence of the nasal duration with the moraic nasals in the middle and in the final positions, and to examine the nasal duration for learners with different Japanese language proficiency in Taiwan.

In accordance, this study aims to investigate into the following questions:

1. Does the nasal duration still play a crucial part in perceiving the moraic nasals, when the /N/ sound is not adjacent to a nasal sound?
2. Would the moraic nasals in the middle and in the final positions be perceived with different nasal duration?
3. Do learners with different Japanese language proficiency in Taiwan perceive Japanese moraic nasals with different nasal duration?

2. Methodology

The perception test of Japanese moraic nasals in this study aimed to examine how the nasal duration and the position of the moraic nasals influenced learners' perception of the moraic nasals in the Japanese language, and also to examine if learners with different Japanese proficiency perceived Japanese moraic nasals differently.

2.1. Subjects

The subjects of the study are seventy-two university learners who are learning Japanese as a second language in Taiwan. Fifty-four of the subjects have passed Japanese-Language Proficiency Test level N1-N2 (equivalent to CEFR B2-C1) and are defined

as Group A while the other subjects with the Japanese proficiency level between N3-N5 (equivalent to CEFR A1-B2) are defined as Group B.

2.2. Stimuli

Eight words were selected to be used in this perception test: /kakeN/ / kaNke/ / kakkeN/ / kaNkei/ (K series) /kateN/ / kaNte/ /katteN/ /kaNtei/ (T series). Each of them has a minimal pair without /N/ sound.

The words on the perception test of the study were recorded digitally¹ by a female native speaker of the Japanese language.

The /N/ sound in these words was divided into six segments of different nasal durations² and then to be presented as stimuli in both descending series and ascending series for the subjects to distinguish if there was a /N/ sound. There were seven stages of different nasal duration for each word. The nasal duration at each stage for the words was presented in Table 1.

Table 1: The nasal duration at each stage for the words used in this study.

word	Nasal duration (ms) for each stage						
	7	6	5	4	3	2	1
/kakeN/	109	90.9	72.8	54.7	36.6	18.5	0.4
/kaNke/	108	90	72	54	36	18	0
/kakkeN/	94	78.4	62.8	47.2	31.6	16	0.4
/kaNkei/	128	106.7	85.4	64.1	42.8	21.5	0.2
/kateN/	94	78.4	62.8	47.2	31.6	16	0.4
/kaNte/	91	75.9	60.8	45.7	30.6	15.5	0.4
/katteN/	89	74.2	59.4	44.6	29.8	15	0.2
/kaNtei/	117	97.5	78	58.5	39	19.5	0

2.3. Procedure

The subjects were tested individually in a language laboratory, in which they listened to the stimuli over the headphones³.

The stimuli were presented in both descending series and ascending series for the subjects to distinguish if there was a /N/ sound.

The stimuli would be played automatically at each stage in both descending series and ascending series. The subjects were asked to decide if there was a /N/ sound by pressing a button with the hiragana /N/ and the other button without the hiragana /N/ in twenty seconds.

In the descending series, the subjects were instructed to listen for a word without the /N/ sound. They were instructed to press the button of the word

without the hiragana /N/ as soon as they detected the target and to write down the number for the nasal duration shown on the screen on their answer sheet.

In the ascending series, the subjects were instructed to listen for a word with the /N/ sound. They were instructed to press the button of the word with hiragana /N/ as soon as they detected the target and to write down the number on their answer sheet.

3. Result

The analyses of the threshold values of the nasal duration, and the analyses of repeated measure ANOVA were conducted to compare the mean of the nasal duration among the position of the moraic nasals and the groups of learners with different Japanese language proficiency in both descending and ascending series.

3.1. Threshold values in the descending series

The threshold values of the nasal duration in the descending series for Group A learners and Group B learners tested with the eight stimuli were illustrated in Figure 1.

For the position of the moraic nasals, the /N/ sound in the final position tended to be perceived with shorter nasal duration especially in K series.

As for the groups of learners with different Japanese language proficiency, the result showed that no matter what the stimulus was, the learners in Group A needed shorter nasal duration in perceiving the moraic nasals while the learners in Group B needed longer nasal duration in perceiving the moraic nasals.

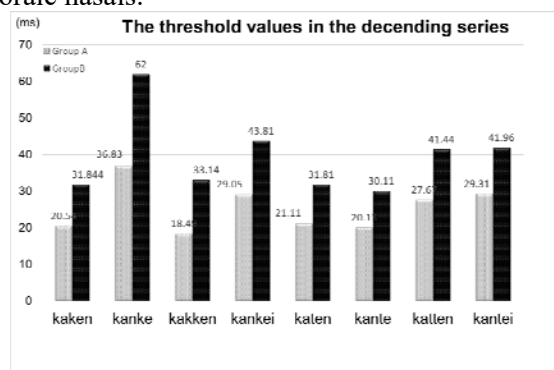


Figure 1: Threshold values in the descending series.

3.2. Threshold values in the ascending series

The threshold values of the nasal duration in the ascending series for Group A learners and Group B learners tested with the eight stimuli were illustrated in Figure 2.

For the position of the moraic nasals, the moraic nasals in the final position tended to be perceived

with shorter nasal duration in both K series and T series.

As for the groups of learners with different Japanese language proficiency, except for the stimuli /kaken/ and /kakken/, the learners in Group A still perceived the moraic nasals with shorter nasal duration than the learners in Group B.

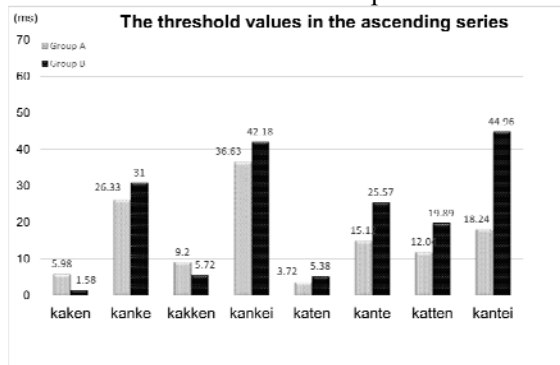


Figure 2: Threshold values in the ascending series.

3.3. ANOVA for the descending series

The analysis derived from the repeated measure ANOVA for the descending series was presented in Table 2.

First, the p-value for interaction showed that there were no statistically significant results between Japanese language proficiency and the word differences ($p=0.74>0.05$).

Secondly, both main effects showed statistically significance. The p-value for the learners with different Japanese language proficiency was $0.036^*<0.05$, and the p-value for the word differences $8.33E-09^{***}<0.05$.

Therefore, we could infer that the learners in Group A and the learners in Group B need different nasal duration in perceiving Japanese moraic nasals, and the different stimuli also influence the perception of Japanese moraic nasals.

Table 2: ANOVA of the nasal duration for the descending series.

Source	SS	df	ms	F	P
Interaction	2183.409	7	311.9155	0.62	0.74
Japanese language proficiency (Group A & B)	21542.04	1	21542.04	4.58	0.036*
Word differences (8 stimuli)	27110.35	7	3872.907	7.67	8.33E-09***
Error	247366.5	490	504.8295		

3.4. ANOVA for the ascending series

The analysis derived from the repeated measure ANOVA for the ascending series was presented in Table 3.

Although both main effects, the learners with different Japanese language proficiency and the word differences, showed statistically significant results, the p-value for interaction led to significant results ($p=0.002^{**}<0.05$). Therefore, we could not interpret the main effects without considering the interaction effect.

Table 3: ANOVA of the nasal duration for the ascending series.

Source	SS	df	ms	F	P
Interaction	9062.951	7	1294.707	3.35	0.002**
Japanese language proficiency (Group A & B)	4054.138	1	4054.138	3.21	0.077
Word differences (8 stimuli)	72740.95	7	10391.56	26.85	3.39E-31***
Error	189630.4	490	387.0007		

4. Discussion and Conclusion

Based on the results of the perception test conducted in this study and the validation of the previous research, two conclusions were made.

For learners with different Japanese language proficiency, the learners with lower Japanese language proficiency needed longer nasal duration in perceiving Japanese moraic nasals. This result resonated with the previous study [5].

As for the position of the moraic nasals, it was observed that the moraic nasals in the final position were perceived with shorter nasal duration than the moraic nasals in the middle position.

Furthermore, it was observed that even when the nasal duration was close to zero, the stimuli could still be perceived as moraic-nasal words. This might suggest that the manner of articulation is more crucial when the moraic nasal is not adjacent to a nasal sound.

With regard to the threshold values, the previous study [5] indicated that the threshold values in the ascending series were longer than those in the descending series for the learners with lower Japanese proficiency, while the learners with higher Japanese proficiency showed reversal results. However, the threshold values in the ascending series were shorter than those in the descending series for both of the learners with different Japanese proficiency levels in this study. The different findings of the threshold values might result from the differences of the subjects⁴. This suggested that

Japanese native speakers should be included as the subjects in future studies in order to compare the judgements of Japanese native speakers with the judgments of the learners of Japanese language as a second language in Taiwan.

5. Suggestion

The nasal duration is a crucial element in perceiving Japanese moraic nasals since both moraic nasals and nomoraic nasals are nasal consonants. However, according to the findings of the perception test conducted in this study, it is observed that the manner of articulation would also influence learners' perception. Therefore, it is important to guide learners to focus on the duration of nasal consonant instead of nasal qualities when presenting the moraic nasals to the learners who are learning Japanese language as a second language.

Furthermore, since the /N/ sound in the final position would be perceived with shorter nasal duration, it is suggested that the instructors pay more attention to the moraic nasals in the final position in order to ensure that learners pronounce the moraic nasal words with proper nasal duration.

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7. References

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⁴ The subjects in Uchida (1995) were four Japanese, four Chinese-experts who had taught Japanese and lived in Japan for more than 5 years and four Chinese-novices who had learned Japanese as a second language for six months.

¹ The stimuli were recorded by SONY PCM-D1.

² The /N/ sound in the selected words was divided by the speech analysis software, Praat.

³ The headphones used in the perception test were Logitech 981-00086.