Baby-Word Rhythm Preferences Of Japanese Infants

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Abstract: Questionnaires to Japanese mothers revealed that many words they use in child-directed speech take the form of XsX or XsXS (X = regular mora; s = special mora). Using a head-turn listening preference paradigm, 8-10 month old Japanese infants were found to show a preference in listening to lists of pseudo-words that conform to the XsX pattern when compared to another list of words with three regular morae (XXX). 4-6 month old infants showed no such preference. An additional experiment eliminated the possibility that the results of the first experiment were simply based on the presence or absence of special morae in the lists.

INTRODUCTION

What kind of cues could infants use in segmenting individual words from a continuous flow of speech? In English, many studies have shown that the predominant stress pattern for words (i.e., Strong-weak syllable sequence, called a trochaic foot) play a critical role in perception, segmentation, and in production during early speech development. In particular, infants acquiring English have been found to show a preference for lists of words that conform to the predominant stress pattern by 9 months of age (1).

The basic rhythm of Japanese is considered to be mora-timed. The presence of so-called special morae (geminate stop or fricative consonants Q, moraic nasal N, and long vowel H) distinguishes Japanese from languages that are not mora-timed. In Japanese, each mora tends to be uttered with a regular duration whether it is a regular or a special mora. As opposed to regular morae (CV or V), which can exist independently, special morae can only exist only when preceded (or in the case of Q, preceded and followed) by regular morae. In this paper, we investigated whether or not we can find a rhythmic unit in Japanese that might play a similar role to the English trochaic foot in early speech development.

A questionnaire to Japanese mothers revealed that the vocabulary of Japanese child-directed speech (we call these baby words) revealed that they fit into very restricted rhythmic patterns. Of 513 words collected, 83% of them were either 3 or 4 morae long. Furthermore, 3-mora words that contained a special mora in the middle, e.g., waNwa (doggy), kuQku (shoes), buHbu (car) (XSX pattern) accounted for 80% of 3-mora words, and 4-mora words that contained special morae at the second and fourth position, e.g. waNwaN (dog), buRbuR (car) (XSXS pattern) accounted for 62% of the 4-mora words. We hypothesized that the dominant rhythmic patterns found in Japanese baby words might function in a similar manner as the trochaic foot in English.

In this study, we tested whether or not Japanese infants showed sensitivity to the typical rhythmic patterns of Japanese baby words in two experiments using the head-turn listening preference method.

EXPERIMENT 1

Stimuli: Stimuli in these experiments were lists of pseudo-words, which were 3 morae long. The special mora lists (S1) consisted of 3-mora pseudo-words each of which contained a special mora in the second position (XsX). Each list consisted of 30 words, 10 containing Q, 10 containing N, and 10 containing H in the second position. The 30 words were ordered randomly. The regular mora lists (R1) were created by exchanging the special mora of the pseudo-words with regular morae (XXX). 8 pairs of lists were prepared. 2 of these were used for practice, and the remaining 6 pairs (12 lists total, 6 special mora lists and 6 regular mora lists) were used for test.

Participants: 24 healthy Japanese infants between 8 and 10 months of age, and 24 infants from 4 to 6 months of age participated in Experiment 1.

Procedure: Infants were tested in a booth that was surrounded by peg boards on three sides, as shown in Figure 1. The infant sits on the mother’s lap, and an experimenter who is behind the front panel observes the infant through the holes on the peg board. First, the green light on the front panel starts blinking. When the infant looks at the green light, a red light on one or another side of the infant starts blinking. When the infant turns his/her head towards the blinking light, the speaker start playing either a special mora list or a regular mora list. The trial
continues until either the infant looks away for two seconds or until the entire list has been played, at which time
the light is turned off and a new trial begins. The experimenter observes the infant's gaze and head-turning from
behind the peg board and records the infants' responses by pressing response keys. The duration of time during
which the infant's head was turned towards the blinking red light was calculated as the listening time. Four practice
trials and 12 test trials were done consecutively.

Results: As can be seen in Figure 2, 8 to 10-month old infants listened to the special mora list significantly
longer than the regular mora list (t(23) = 4.56, p<.001) while 4 to 6-month old infants did not show a significant
difference (t(23) = 1.15).

These results suggest that by 8 to 10 months of age, Japanese infants prefer to listen to lists that conform to the
predominant rhythmic pattern of Japanese baby words. However, it is possible that the 8 to 10-month old infant
preferences were based on the presence or absence of special morae in the lists, rather than on the rhythmic pattern of
the words. In order to eliminate this possibility, Experiment 2 was conducted.

EXPERIMENT 2

Stimuli: Special mora lists in this experiment contained a special mora in the third position of 3-mora pseudo-
words (XXS). Since the geminate consonant Q cannot occur word-finally, long vowels H and moraic nasals N were
used. The regular mora lists (XXX) were created by substituting the special morae of the pseudo-words with regular
moraes.

Participants: 24 healthy Japanese infants between 8 to 10 months of age participated in this experiment.

Procedure: Exactly the same procedure was used as in Experiment 1.

Results: The right hand bars in Figure 2 show the results of Experiment 2. As can be seen from this figure, 8 to
10-month old Japanese infants did not show any preference to the special mora lists in this experiment.

DISCUSSION

The results from the two experiments show that by 8 to 10 months of age, Japanese infants prefer to listen to lists
of words that conform to the predominant rhythmic patterns that were found in the vocabulary of Japanese baby
words. The older infants' preference for XSX words was not based on the presence of the special morae per se, but
on the moraic pattern of the words. The fact that younger infants did not show similar preferences indicates that the
preference emerges sometime between 6 and 8 months of age. The pattern of the results is similar to that found in
English, where preferences for trochaic feet were found only among infants around 9 months of age.

REFERENCES

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