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Study on the Acoustic Characteristics of Nagauta Performers' Voice Techniques

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Abstract

Genres of songs have their own cultural and social contexts, and vocal expressions formed by the different body techniques acquired in each context produce a variety of auditory impressions. How, then, do voices differ as a result of such embodied knowledge? In response to this question, the authors focus on *nagauta*, a type of Japanese traditional music. We have described the process by which the distinctive tone of *nagauta* is produced using sound visualization (Ichikawa et.al. 2019, Ichikawa et.al. 2020). Previous studies identified a difference between *nagauta* and western vocal performance in the vowel production and movement between syllables.

This study aimed to identify the acoustic characteristics that create the essence of *nagauta* using visualization. We focus on embellishments known as *atari* (added when the same pitch is maintained), a unique singing way of *nagauta*.

As the research method, four *nagauta* performers and two western style accomplished vocalists were asked to sing part of the *nagauta Sanbasou*, and sound frequency and loudness analyses were conducted. The western style vocalists were instructed to imitate the singing style of the *nagauta* performers. Focusing on the embellishment form, comparisons were made between the voices of the western style vocalists and the *nagauta* performers, and among the voices of the four *nagauta* performers themselves.

The analysis showed that in the embellishment section, the two vocalists were roughly able to imitate the timing of the *nagauta* performers, and they were also able to follow the pitch. However, regarding acoustic pressure (loudness), the vocalists demonstrated a rise in loudness as the basic frequency rose, while all four of the *nagauta* performers showed a fall in loudness. In addition, regarding the movement of sound before and after the embellishment, the change in the acoustic pressure level by the vocalists when moving between syllables was moderate. Although there were individual differences, the change in the acoustic pressure level by the *nagauta* performers was significant. It can be said that the *nagauta* performers express embellishment by skillfully manipulating pitch and timing as well as the acoustic pressure.

This voice analysis encompassing multiple parameters showed the complex voice operation of the *nagauta* singers. The result, while only a single example, can provide insights useful for the teaching and learning of traditional vocal music.