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非日本語話者への日本語音声による情報伝達を可能とする要因の実験的検討
The Experimental Study on Factors which Enable to Communicate information to Non-Japanese Speakers with Japanese Speech Sounds.

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Communicating information between speakers who do not share same language is generally difficult. It is considered that this is due to the arbitrariness of language, which a meaning is not fixed to a certain speech sound between different language because a rule of relation between a speech sound and a meaning exists each language.

Communicating information with speech sounds follows a process, which a speaker converts a meaning into a speech sound, then listener reconverts the meaning from the sound received from the speaker. In this research, we define the case of matching the meaning which the sound the speaker converted and the meaning which the listener reconverted from the received sound as success in communicating information. In the case that the speaker and the listener share the same language, communicating information will succeed, because they can convert the meaning into the sound and the sound into the meaning each other by following the essentially same rule of relation between the speech sound and the meaning. However, in the case of people who do not share the same language, communicating information will not succeed because the listener may be not able to reconvert the meaning from the sound received from the speaker correctly due to the lack of knowledge on mapping between meanings and sounds of the language of the speaker.

In this research, we aim to identify some factors related to success of communicate information between Japanese speakers and non-Japanese speakers. The reason of failure of communicating information to non-Japanese speakers with Japanese speech sounds is supposed that they cannot guess the meaning from the sounds because of arbitrariness of language, as they do not have some sufficient knowledge on the map between meanings and the sounds in Japanese. Then, we define nonarbitrary relation between the speech sound and the meaning as sound symbolism. We hypothesized that non-Japanese speakers may be able to guess the meaning from Japanese words which have the sound symbolic system in Japanese vocabulary and the words may be onomatopoeia. We examined this by a series of hypothesis experiments.

In the experiment, both Japanese speakers and non-Japanese speakers listened to the sound of Japanese onomatopoeia, which was selected by a prior pilot experiment, then chose a shape, expressing a meaning in the visual form, to which each given Japanese

sound is associated. We set the shape to which Japanese speakers associated the Japanese onomatopoeia sound as a “correct” choice, and then we tested whether non-Japanese speakers could choose the correct or similar shape from the same sound. The result of the experiment showed that Japanese speakers were likely to choose the specific shapes to Japanese onomatopoeia sounds which seemed that they used in a daily life. Non-Japanese speakers tended to choose the specific shape to some sounds with some high probability, however, the degree of concentration in their choice probabilities was lower than Japanese speakers. Then, we analyzed whether there was structural similarity in the shape choices by Japanese and non-Japanese speakers with correspondence analysis. The result of the correspondence analysis suggests that both Japanese and non-Japanese speakers perceived each shape on the spatial axis of shape with curved and linear property at both ends and correspond them with Japanese onomatopoeia sounds. This result can be interpreted as a bouba/kiki effect, which was showed in experiments of the existing study. The whole set of Japanese onomatopoeia sounds is supposed to have a similar structure with bouba/kiki-like mapping, and it suggests the sound system of Japanese onomatopoeia is sound symbolic. Moreover, the result of the analysis on phonetical properties showed that Japanese speakers and non-Japanese speakers had some common structure in sound-shape mapping, in particular Japanese onomatopoeia sounds with some specific vowels and consonants. and then it was expected that both speakers recognized Japanese onomatopoeia sounds on the axis which had opposed phonetic sounds at both ends. This means that the whole Japanese onomatopoeia system has similar tendency as words used in former bouba/kiki effect study and suggests that Japanese onomatopoeia has the sound symbolic system from the view of tendency of each phonetic sound which constructs Japanese onomatopoeia, too.

Therefore, it is suggested that it is potentially possible to communicate with non-Japanese speakers with Japanese onomatopoeia sounds.