

How people imitate natural sounds?

–A study of English and Japanese onomatopoeic expressions

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ABSTRACT

This study focuses on the relationship between natural sounds and their onomatopoeias in English and Japanese. Japanese has many sound-symbolic words but English is said to have few. However, sound symbolism is said to be a universal feature common to human language. English speakers can imitate some natural phenomena though their expressions do not have the onomatopoeic features. For the experiment, 15 English and 15 Japanese subjects were asked to imitate sounds that have similar acoustic features. Recorded data were transcribed and analyzed in terms of speech sounds. Researchers note that the F2 show the characteristics of natural sounds, but this study focuses on noises. Results show that the imitating expressions are different, though there are common features in expressions.

1. INTRODUCTION

Sound symbolism is said to be a universal feature common to languages. Japanese have many onomatopoeic words. English, however, is said to have few onomatopoeic words. Tamori et. al. (1999) notes that the morphological and phonological characteristics of English onomatopoeias are not particular to onomatopoeias. Some scholars say that English is not the good example of the use of sound symbolism (Reay:1994). Though there are a lot of onomatopoeic words or not, humans can somehow imitate certain sounds. When we listen to some sounds, certain speech sounds will be recalled to symbolize them. English-speaking people can imitate or symbolize some natural phenomena or natural sounds by their sounds, though their expressions do not have the features that can be seen in other languages and their expressions are not onomatopoeic. The appropriate sounds and sound expressions to express certain natural sounds may be different in languages. In this study, I conducted an experiment of how people express some sounds that have the similar acoustic features and compared their imitating productions. I also saw what types of sounds are used to imitate sounds.

2. METHODS

2.1 subjects

The subjects were fifteen native speakers of American English and fifteen native speakers of Tokyo Japanese.

2.2 Materials

There were four sounds that show random noise patterns (see Figures 1-4 below). Sounds of water streaming, rain falling, wave crashing and a person watering with a hose are used. All these sounds were obtained from the sound effect CDs.

2.3 Instructions and procedure

Subjects listened to these natural sounds from the computer. After they listened to one sound, they are asked to imitate it by using speech sounds. However, the vocal mimicry is not permitted for imitation. In the experiment, the information of these sounds are not told to the subjects. Subjects should imitate sounds without knowing actually what kind of sounds they are.

2.4 Analysis

The imitating voices are recorded and transcribed afterwards by the researcher. Most of the productions are repeating patterns of some sounds so the analysis is done for one repeating unit.

3. RESULTS

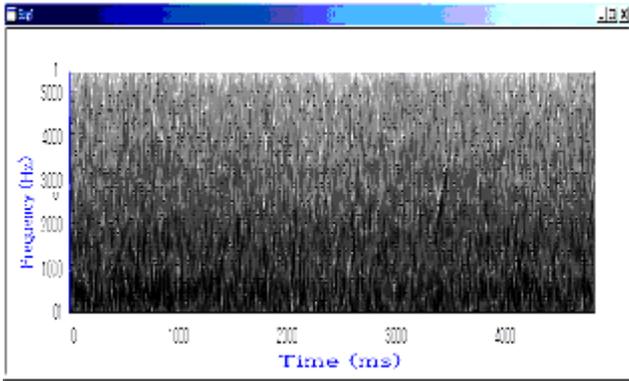


Figure 1 Spectrogram of the sound of water streaming

Table1 : Imitations of water streaming

Japanese speakers		English speakers	
Production	Number	Production	Number
dza:	6	hə:	1
dzawa:	2	hu	1
dzara	1	ʃu:	1
go:	1	ʃi:	1
do:	1	gɹægl	1
sa:	1	plɑ:	1
sara	1	khu:	1
		tʃækə	1
		splɑ:ʃə:	1
		kə	1
		gagl	1
		kə:	1
		wuʃ	1
		wisp	1
		əʔʃə	1

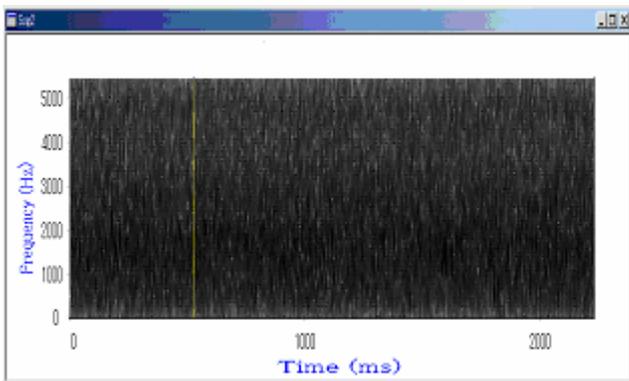


Figure 2 Spectrogram of the sound of a rain falling

Table2 : Imitations of a rain falling

Japanese speakers		English speakers	
Production	Number	Production	Number
dza:	9	kə:	2
ga:	3	kəʃ	1
bo:	1	kəʃə	1
dwa:	1	dada	1
buubwo:	1	pʊʃə:	1
		hu:	1
		ʔuʃi:	1
		ʃu:	1
		ʃə:	1
		tʃi:	2
		pʃə	1
		pʃə:	1
		wu:ʃ	1

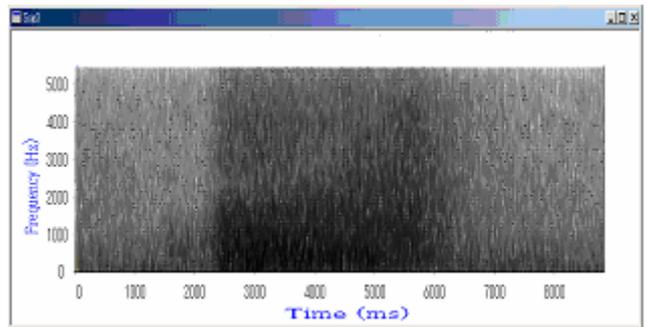


Figure 3 Spectrogram of a wave crashing

Table3 : Imitations of a wave crashing

Japanese speakers		English speakers	
Production	Number	Production	Number
dza:	8	bæŋ	1
dzadza:N	1	bəhə:	1
dzuwa:	1	kə	1
dzabw:N	1	kə:u:	1
bu:N	1	kuɹɑʃ	1
buwa:	1	splɑ:ʃ	1
go	2	khu:	1
		kɹæ:ʃ	1
		kɹɑʃi	1
		ʃə:	1
		ʃi:	1
		hwa:	1
		wə:	1
		u:ʃə	1
		NONE	1

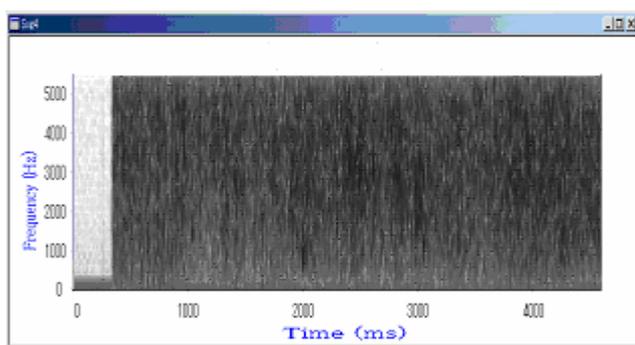


Figure 4 Spectrogram of watering with a hose

Table4 : Imitations of watering with a hose

Japanese speakers		English speakers	
Production	Number	Production	Number
piri	1	pʃu:	1
patʃi	2	kɪʃ	1
pafɑ	1	tʃi:	1
basa	1	pʃə:	1
batʃi	2	kɪɑntʃi	1
bari	1	kə:	2
bitʃɑ	1	kə:i:k	1
bitʃi	1	gə:ʃ	1
gafɑ	1	fʊ:	1
miri	1	ʃə:	2
dzawa	1	ɪʌsɪ	1
tʃi:	1	ə:ʃu:	1
sa	1	u:ʃə	1

3.1 the sound of water streaming

Japanese onomatopoeia of this sound is *SARA-SARA* (Atoda et.al 1993), but there is only one Japanese speaker that use this pattern. About 40 % of Japanese subjects produced [dza:] to imitate this sound. The Japanese onomatopoeia [dza:] means a large body of water moving vigorously (Ono 1984). In total, 60% of Japanese speakers use the voiced affricate [dz] at the beginning of their imitation. 86% of them use the open vowel [a] in the production. There are only two cases that the vowel [o] is used.

The productions of English speakers are varied. [gɪəgl] and [gəgl] may be the pronunciation of the word “gurgle”, though this word means a hollow bubbling sound. [splɑ:ʃə:] may be the pronunciation of the word “splash”. The meaning of this word is to make liquid strike or to move around in water. The other imitations are

idiosyncratic ones. various consonants are used at the beginning, but 40% of the English speakers produced schwa to imitate.

3.2 the sound of a rain falling

In Japanese, various kinds of onomatopoeias can be found depending on the condition of the rain. The most typical type of onomatopoeia of a rain falling is *ZA-ZA*. 53% of Japanese speakers produced this typical onomatopoeia to imitate this sound. [go:], [bo:] and [ga:] are also found among Japanese subjects but these patterns do not represent the sound of rain in Japanese. In total, all of the imitations begin with voiced consonants; 65% of them is the voiced affricate [dz] and about 33% are voiced plosives. Vowels the Japanese speakers most frequently used are open vowel [a] (86%). [u] and [o] are found in one case each.

English speakers imitated this sound in various ways. [wu:ʃ] is the pronunciation of the word “whoosh”, which means moving quickly or suddenly and with a rushing sound. The other productions show idiosyncratic patterns. About 40% of the American subjects began with plosives and 26 % of them began with fricatives. Vowels that they used are /u/ ([u] and [u:]) and /ə/ ([ə] and [ə:]). High vowels [i] and [i:] are found in one case each.

3.3 the sound of a wave crashing

To symbolize the sound of a wave crashing, *ZABU-ZABU* and *ZABUN* are the most typical types of onomatopoeias. However, *ZABUN* is found in only one case and *ZABU-ZABU* is not found among Japanese speakers. 53% of Japanese speakers imitated this sound as [dza:]. Some subjects produced [bu:rN], [buwa:] and [go] but these patterns do not mean this sound normally. In total, all Japanese subjects begin their imitations with voiced consonants. Voiced affricate [dz] and voiced plosives are used. Vowels the Japanese speakers used are open vowel [a] in many cases. (66%). [o] and [u] are found in some cases.

We can see various types of productions among English speakers. The production [splɑ:ʃ] may be the pronunciation of the word “splash” and [kɪʌʃ], [kɪæ:ʃ] and [kɪʌʃi] are influenced by the word “crash”. In total, 33% of the American subjects begin with plosives. and 13% of them use fricatives. Vowels they often used are /ə/, /a/, /u/ and /i/.

3.4 the sound of a person watering with a hose

Shu-Shu is the Japanese onomatopoeia which represents the sound of water spurting out from a hole in the hose. However, there is no Japanese speakers who produced this pattern to imitate this sound. Though the acoustic feature of this sound is similar to the other sounds, there is no agreed imitations among Japanese subjects. As is the same with English speakers, various patterns of productions were obtained. 80% of Japanese speakers begin with stop

consonants. [p], [b], [m] and [g] are found. Vowels they use are [a] and [i] in both first and second mora. In the first mora, open vowel [a] tends to be used but in the second, close vowel [i] tends to be produced.

The imitations of English speakers are varied, too. [kɾantʃi] may be the pronunciation of the word “crunch”, which means crushing with the teeth. [ɾas] is the pronunciation of the word “rustle”, which represents a soft, muffled cracking sound. The other productions are idiosyncratic patterns. English speakers begin their imitations with plosives and fricatives. Vowel that is most frequently used is schwa. 46% of speakers produce [ə] or [ə̃].

4. CONCLUSION

Analyzing the imitations of natural sounds, Japanese speakers tend to imitate in onomatopoeic patterns but the productions by English speakers do not show onomatopoeic patterns. As there are many onomatopoeias in Japanese, Japanese speakers tend to use the onomatopoeic patterns when they imitate or symbolize some natural sounds. In English however, the features of onomatopoeias do not distinguish onomatopoeias from other kinds of lexical items so English speakers tend to imitate some sounds more directly.

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