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Cultural and Gender Differences of Impression of Sound Clips

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Abstract: This paper experimentally clarifies similarities and differences of the impression of sound clips between Japanese and Chinese males, and those between Chinese males and females. Forty sound clips are evaluated through the SD method. It is shown that the factor of brightness commonly appears in the impression factors of Japanese males, Chinese males, and Chinese females, while the other factors do not always appear. The factors of Japanese males may be similar to those of Chinese females.

Keywords: *Impression factors, Differences, Impression, Sound clips*

1. INTRODUCTION

In recent years, there are opportunities to watch and listen to a lot of multimedia data including pictures, sound clips, and video clips. Multimedia data give various impressions to human beings. For example, many people feel fresh and clear in a scenery picture.

As people in different countries have different education and cultural background, the people in different countries have different feelings to the same object. Cultural and gender differences of the impression of pictures have been well studied [1-4]. Common and different factors for people having different nationalities have been revealed. Although the impression factors of sound clips were obtained [5], cultural and gender differences of the impression of sound clips are not studied well. These are required to be clarified in order to satisfy the emotional requirements of people in different countries.

This paper clarifies cultural and gender differences of the impression of sound clips. It is experimentally shown that the brightness factor appears for Japanese males, Chinese males, and Chinese females. The other factors of Japanese and Chinese males are quite different. Although the activity factor commonly exists for Chinese males and females, the other factors could not be said to be the same. It is shown that the factors of Japanese males and those of Chinese females are similar.

The remainder of the paper is structured as follows. Section 2 describes the related works. Section 3 describes the experiment. Section 4 shows the experimental results.

Section 5 gives some considerations to the experimental results. Finally, Section 6 concludes the paper.

2. RELATED WORKS

2.1 Cultural comparison of the impression of pictures

Cultural comparisons of the impression of pictures have been conducted. Yang *et al.* elaborated on the similarities and differences of the impression of pictures between Japanese and Chinese [1]. Yang *et al.* revealed the following differences:

Compared with Chinese males, Japanese males are easily affected by the factors “Potency” and “Activity.”

In comparison with Japanese males, Chinese males are more affected by the factor “Naturalness,” that is, Chinese males pay more attention to the natural sense.

Du *et al.* compared the cultural difference of the influence on the impression by images having different resolutions [2]. They conducted subjective experiments with Japanese and Chinese participants. They obtained three factors from the experimental results for both Japanese and Chinese participants. As the three factors obtained from the Japanese results corresponded to those obtained from Chinese ones, the factors could be compared with each other. They placed factor scores in the two-dimensional space of each two factors for Japanese and Chinese results. As the distribution of the factor scores of the second and the third factors of Japanese people is quite different from that of Chinese ones, Du *et al.* concluded there are some cultural differences in the third factor named “Naturalness.”

Table 1: Factor loadings of Japanese males

Impression Word Pair	Factor 1	Factor 2	Factor 3	Factor 4
Beautiful - Ugly	-0.52	-0.51	-0.41	0.40
Natural - Artificial	-0.49	-0.45	0.11	0.01
Wet - Dry	-0.47	-0.24	-0.34	0.01
Glad - Sad	-0.27	-0.85	-0.22	0.06
Hot - Cold	-0.18	-0.85	-0.10	-0.11
Bright - Dark	-0.06	-0.84	-0.27	0.30
Tense - Relaxed	0.27	0.71	0.39	0.47
Simple - Complex	-0.06	-0.53	-0.10	0.00
Strong - Weak	-0.03	0.27	0.92	0.09
Large - Small	0.05	0.31	0.86	-0.10
Bold - Delicate	0.21	0.07	0.77	-0.18
Heavy - Light	-0.25	0.51	0.71	-0.36
Active - Passive	0.23	-0.05	0.63	0.21
Pure - Impure	-0.32	-0.38	-0.55	0.54
Hard - Soft	0.18	0.13	0.20	0.86
Fresh - Stale	-0.28	-0.08	-0.25	0.63

2.2 Impression of sound clips

Hochin and Tsuji clarified the impression factors of multimedia data including sound clips [5]. Twelve Japanese students evaluated forty sound clips. These are songs of birds, the sound of a stream, etc. The average length of a sound clip is about ten seconds.

By applying factor analysis to the scores obtained from the experiment, four factors are obtained. Table 1 shows the factor loading matrix. The factor loadings whose absolute values are more than 0.75 are hatched. If there is no such factor loading in a factor, the factor loadings, each of whose absolute value is the largest one in those of the word pair and is in the top 10% largest ones in those of the factor, are hatched. Four factors obtained are of naturalness, brightness, potency, and sharpness.

3. EXPERIMENTAL METHOD

3.1 Purpose

The purpose of the experiment is to clarify cultural and gender differences in the impression of sound clips. The impression factors of Japanese and Chinese are compared.

3.2 Experimental environment

The experiment was conducted in a calm room on the fifth floor of a building of Kyoto Institute of Technology. A participant sat on a chair and listened to the music pieces with an earphone (Apple EarPods).

3.3 Stimuli

The stimuli used in the experiment are 40 audio clips used in the previous study [5]. These are songs of birds,

the sound of a stream, etc.

3.4 Design

The presenting order of sound clips is decided at random for each participant. After a participant listened to a sound clip, he/she evaluated it through the Semantic Differential (SD) method in five steps (-2, -1, 0, 1, and 2). The impression word pairs shown in Table 1 [5] are used.

3.5 Procedure

14 male and 14 female Chinese university students joined this experiment.

The experimenter explained the personal information management, data management, and the experimental procedure. A participant listened to sound clips and evaluated them.

4. RESULTS

The mean scores were obtained for male and female participants. The factor analysis was applied to them to obtain the factors of sound clips for males and females. A cumulative contribution ratio was calculated in descending order of the eigenvalues of factors obtained. From the first factor to the factor whose cumulative contribution ratio exceeding 80% were adopted as the factors of sound clips.

4.1 Result of males

Eigenvalues, contribution ratios, and cumulative contribution ratios of the first four factors are shown in Table 2. As the cumulative contribution ratio of the third factor exceeds 80%, three factors are adopted as the factors of sound clips for males.

The factor loadings of males are shown in Table 3. The factor loadings are hatched as described in Section 2.2. The first factor is of potency because the impression word pairs of "Strong - Weak," "Large - Small," "Bold - Delicate," and "Heavy - Light" have large absolute values. The second factor may be of brightness because the factor loadings of the impression word pairs of "Glad - Sad," "Hot - Cold," and "Bright - Dark" are large. It is considered that the third factor is an activity factor because the impression word pair of "Active - Passive" has the largest factor loading.

4.2 Result of females

Eigenvalues, contribution ratios, and cumulative contribution ratios of the first four factors are shown in Table 4. As the cumulative contribution ratio of the fourth

Table 2: Eigenvalues, contribution ratios, and cumulative contribution ratios of factors of Chinese males

Factor	Eigenvalue	Contribution ratio	Cumulative contribution ratio
1	11.43	44.1%	44.1%
2	1.47	30.1%	74.1%
3	0.92	8.3%	82.5%

Table 3: Factor loadings of Chinese males

Impression Word Pair	Factor 1	Factor 2	Factor 3
Beautiful - Ugly	0.61	0.62	0.28
Natural - Artificial	0.69	0.28	0.53
Wet - Dry	0.92	0.11	0.29
Glad - Sad	0.51	0.78	0.21
Hot - Cold	0.29	0.84	0.20
Bright - Dark	0.37	0.82	0.29
Tense - Relaxed	-0.71	-0.63	-0.19
Simple - Complex	0.68	0.45	0.14
Strong - Weak	-0.79	-0.51	0.16
Large - Small	-0.78	-0.50	0.25
Bold - Delicate	-0.76	-0.50	-0.02
Heavy - Light	-0.82	-0.52	0.10
Active - Passive	-0.04	0.16	0.64
Pure - Impure	0.68	0.48	0.18
Hard - Soft	-0.83	-0.43	-0.05
Fresh - Stale	0.54	0.51	0.36

factor exceeds 80%, four factors are adopted as the factors of sound clips for females.

The factor loadings of females are shown in Table 5. The factor loadings are hatched as described in Section 2.2. The first factor is considered to be of brightness because the factor loadings of the impression word pairs of "Glad - Sad," "Hot - Cold," and "Bright - Dark" are large. The second factor is of potency because the factor loadings of the impression word pairs of "Strong - Weak," and "Large - Small" are large. It is considered that the third factor is of naturalness because the impression word pairs of "Natural - Artificial" and "Wet - Dry" have the large factor loadings. The fourth factor is an activity factor because the impression word pair of "Active - Passive" has the largest factor loading.

5. CONSIDERATIONS

5.1 Cultural difference

Here, factors of Japanese males and Chinese males are compared. Factors and the corresponding impression word pairs are shown in Table 6. The brightness factor appears both in Japanese and Chinese males. Their impression word pairs are also the same. Although the potency factor also appears in Japanese and Chinese

Table 4: Eigenvalues, contribution ratios, and cumulative contribution ratios of factors of Chinese females

Factor	Eigenvalue	Contribution ratio	Cumulative contribution ratio
1	10.20	34.4%	34.4%
2	1.79	22.7%	57.2%
3	0.98	18.2%	75.4%
4	0.87	5.5%	80.9%

Table 5: Factor loadings of Chinese females

Impression Word Pair	Factor 1	Factor 2	Factor 3	Factor 4
Beautiful - Ugly	0.73	-0.24	0.50	-0.16
Natural - Artificial	0.40	-0.20	0.83	0.08
Wet - Dry	0.25	-0.30	0.80	-0.04
Glad - Sad	0.90	-0.24	0.25	0.08
Hot - Cold	0.95	-0.14	0.20	0.03
Bright - Dark	0.87	-0.31	0.23	0.14
Tense - Relaxed	-0.72	0.35	-0.42	0.11
Simple - Complex	0.56	-0.42	0.46	0.13
Strong - Weak	-0.26	0.82	-0.09	0.34
Large - Small	-0.16	0.80	-0.29	0.02
Bold - Delicate	-0.38	0.61	-0.45	0.21
Heavy - Light	-0.52	0.70	-0.30	0.23
Active - Passive	0.08	0.18	-0.01	0.50
Pure - Impure	0.56	-0.51	0.36	0.13
Hard - Soft	-0.50	0.57	-0.44	0.36
Fresh - Stale	0.62	-0.41	0.30	0.42

Table 6: Comparison of factors of Japanese and Chinese males

Factor of Japanese Male	Impression Word Pair	Impression Word Pair	Factor of Chinese Male
Naturalness	Natural - Artificial	-	-
	Beautiful - Ugly		
Brightness	Glad - Sad	Glad - Sad	Brightness
	Hot - Cold	Hot - Cold	
	Bright - Dark	Bright - Dark	
Potency	Strong - Weak	Strong - Weak	Potency
	Large - Small	Large - Small	
	Bold - Delicate	Bold - Delicate	
	-	Heavy - Light	
		Hard - Soft	
Wet - Dry			
Sharpness	Hard - Soft	-	-
-	-	Active - Passive	Activity

males, the impression word pairs of Japanese males are included in those of Chinese males. The naturalness and the sharpness of Japanese males are not included in the factors of Chinese males, while the activity of Chinese males is not included in the factors of Japanese males.

The brightness factor is the same, while the other factors are quite different in the factors of Japanese and Chinese males.

Table 7: Comparison of factors of Chinese males and females

Factor of Chinese Male	Impression Word Pair	Impression Word Pair	Factor of Chinese Female
Brightness	Glad - Sad	Glad - Sad	Brightness
	Hot - Cold	Hot - Cold	
	Bright - Dark	Bright - Dark	
Potency	Strong - Weak	Strong - Weak	Potency
	Large - Small	Large - Small	
	Bold - Delicate	-	
	Heavy - Light	-	
	Hard - Soft	-	
	Wet - Dry	-	
Activity	Active - Passive	Active - Passive	Activity
-	-	Natural - Artificial	Naturalness
		Wet - Dry	

Table 8: Comparison of factors of Japanese males and Chinese females

Factor of Japanese Male	Impression Word Pair	Impression Word Pair	Factor of Chinese Female
Naturalness	Natural - Artificial	Natural - Artificial	Naturalness
	Beautiful - Ugly	Wet - Dry	
Brightness	Glad - Sad	Glad - Sad	Brightness
	Hot - Cold	Hot - Cold	
	Bright - Dark	Bright - Dark	
Potency	Strong - Weak	Strong - Weak	Potency
	Large - Small	Large - Small	
	Bold - Delicate	-	
Sharpness	Hard - Soft	-	-
-	-	Active - Passive	Activity

5.2 Gender difference

Factors of Chinese males and females are compared. Factors and the corresponding impression word pairs are shown in Table 7. The brightness, the potency, and the activity factors commonly appear both in Chinese males and females. The impression word pairs of the brightness and the activity are the same. The impression word pairs of the potency factor of Chinese males are different from those of Chinese females. The naturalness factor appears in the Chinese females’ factors, while it does not appear in the Chinese males’ factors.

Although some differences exist in the factors of Chinese males and females, these are very similar to each other.

5.3 Cross-sectional difference

Here, factors of Japanese males and Chinese females are compared. Factors and the corresponding impression word pairs are shown in Table 8. The brightness factor of Japanese males is the same as that of Chinese females,

which is also the same as that of Chinese males. The naturalness and the potency factors are very similar. On the other hand, the sharpness factor does not appear in Chinese females’ factors, while the activity factor does not appear in Japanese males’ factors.

Factors of Chinese females may be more similar to those of Japanese males than those of Chinese males.

6. CONCLUSION

This paper tried to experimentally clarify cultural and gender differences of the impression of sound clips. Cultural differences are examined for Japanese and Chinese males, while gender differences are examined for Chinese males and females. It was shown that the brightness factor commonly appeared for Japanese males, Chinese males, and Chinese females. The other factors of Japanese and Chinese males were quite different. Although the activity factor commonly existed for Chinese males and females, the other factors could not be said to be the same. The factors of Japanese males may be similar to those of Chinese females.

The cultural differences of pictures and sound clips were clarified. Clarifying those of video clips and music clips is included in future work.

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