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<https://doi.org/10.15017/1516144>

出版情報：九州大学心理学研究. 16, pp.1-8, 2015-03-01. 九州大学大学院人間環境学研究院
バージョン：
権利関係：

The Effects of Culture-Based Visual Experience on the Evaluation of Japanese and Chinese Historic Buildings

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In this study, we examined whether and how culture-based visual experience influences the evaluation of objects. Following the semantic differential method, we asked Japanese and Chinese participants, whose cultural experiences differed, to report their impressions of selected photographs of Japanese and Chinese historic buildings. The results showed that more culture-based visual experience led to more positive evaluations of the buildings. This tendency was significant for historic buildings with comparatively better exteriors. These buildings are considered to possess more distinctly cultural features, which tend to produce differences in the culture-based visual experiences of the observers.

Key Words: evaluation, culture-based visual experience, historic buildings

Evaluation occurs in relation to almost everything. When, for example, people observe an object, they may or may not like it. At this point, they have generated an evaluation based on what they have observed. However, it is also likely that while one person may like an object, another may not. Furthermore, even though observers may like the same object, the degree of their liking may differ. This suggests that certain factors influence evaluation resulting in different judgments.

One possible factor that affects evaluation is visual experience. The mere exposure effect (Zajonc, 1968) reveals that visual experience may exert an effect on people's impressions of objects. The mere exposure effect is a phenomenon that people's preferences for objects increase with repeated exposure to them. This effect even exists when people repeatedly perceive an object below the level of conscious awareness (Bonnano & Stilling, 1986; Bornstein, Leone, & Galley, 1987; Kunst-Wilson & Zajonc, 1980; Murphy, Monahan, & Zajonc, 1995; Seamon, Marsh, & Brody, 1984). Moreover, such visual experience may not only affect a person's preferences, but may also influence other aspects of the evaluation of objects. Previous works have shown that repeated exposure affects judgments regarding the degree of attractiveness that people possess (Brockner & Swap, 1976; Moreland & Beach, 1992; Peskin & Newell, 2004). Based on these previous findings, high-frequent visual experience may be a factor that increases positive evaluation of objects.

In addition to high-frequent visual experience, daily experience that is not specific to certain objects might be also an

important factor. Cutting (2003) presented the following ideas in his research of artworks preference. People are exposed to a great number of images related to artworks from childhood to adulthood. They may not be able to remember each image and where they saw it, and even could not recognize the image when they see it again. However, the artworks-related visual experience derived from daily exposure might affect assessment of the artworks. According to this view, we considered that people who live in different countries experience and absorb different cultures, and generally possess more culture-based visual experience of objects with specific cultural features of their own country. Here, culture-based visual experience means visual experience that could be used to recognize cultural features of a country, and might be accumulated through cultural knowledge and cultural exposure to education, books, or media in one's daily life. Also, visual experience acquired from a particular social culture, i.e., culture-based visual experience, might bias evaluation. However, it is unclear how culture-based visual experience influences evaluation.

To examine the above hypothesis, in this study we adopted a similar methodology to that of Miura, Sukemiya, and Yamaguchi (2011). Miura et al. (2011) used computer graphics of a Japanese rock garden to explore people's impressions. For our study, we used color photographs of Japanese and Chinese historic buildings. Historic buildings encompass rich historical information about nations, and have gradually become the symbol of national cultures as time goes on. We, therefore, postulated that they would give rise to different culture-based visual experiences of Japanese and Chinese participants, which would enable us to examine differences in evaluation.

¹⁾ The authors would like to thank Sachio Nakamizo and Hiroyuki Mitsudo for their helpful comments on an earlier draft of this manuscript. The authors would also like to thank the two anonymous reviewers for their many constructive comments and suggestions on the manuscript.

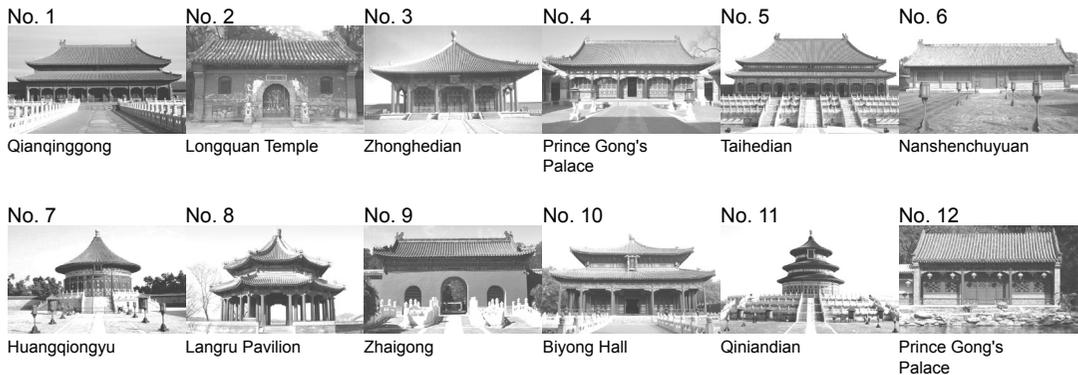


Fig.1 Stimuli composed of 12 color photographs of Chinese historic buildings

Experiment 1

For our first experiment, we examined whether and how culture-based visual experience influences evaluation of Chinese historic buildings. Compared with Japanese participants, Chinese participants are more familiar with Chinese cultural features. Therefore, we postulated that Chinese participants would have more culture-based visual experience of Chinese historic buildings than Japanese participants. Moreover, we used a rating scale of “familiar-unfamiliar” to directly scale whether there were differences in culture-based visual experience between Japanese and Chinese participants.

Methods

Participants. Thirty Japanese students (18 females and 12 males; mean age = 21.8 years) and 30 Chinese students (17 females and 13 males; mean age = 23.7 years) who were studying in Japan participated in this experiment. None of the students had specialized architectural knowledge.

Materials and stimuli. Twelve color photographs of Chinese historic buildings (Fig.1) were used as stimuli.²⁾ All of the buildings were originally built or rebuilt during the Ming and Qing Dynasties (1368–1911 AD). The architectural styles of these dynasties were, therefore, preserved in the buildings. Each photograph, which was 8.4×14 cm in height and width, was printed on a sheet of paper of 14.8×21 cm in size. Thirteen adjective pairs (see Table 1) were used as rating scales and were printed on sheets of B5 paper. These selected adjectives

were appropriate for the purpose of this experiment.

Procedure. Based on the application of the semantic differential method, participants reported their impressions of the photographs of Chinese historic buildings for each of 13 adjective pairs using a 7-point scale. The order of presentation of the photographs was randomized across participants. Before commencing the experiment, we encouraged the participants to intuitively judge the photographs of the buildings without engaging in too much thinking. No information about the buildings was provided to the participants prior to this experiment.

Results and Discussion

A factor analysis using Varimax rotation was conducted on the rating data. Three factors were extracted according to the screen plot and Eigenvalues greater than 1 (Table 1). The first factor consisted of “garish,” “luxurious,” and “beautiful,” which were mainly related to aesthetic assessment of the buildings. We, therefore, considered this to be the evaluation factor. The second factor comprised “oppressive,” “heavy,” and “solid,” which were related to physical properties including potential power of the buildings. We considered this to be the potency factor. The third factor contained “calm” and “familiar,” which were related to culture-based visual experience. Thus, this was considered to be the familiarity factor.

Using Ward’s method, we next performed a cluster analysis to determine which Chinese historic buildings produced similar impressions. The results indicated that all of the buildings could be divided into two groups based on similar impressions of buildings within each group. The group of buildings with relatively higher average rating scores for the evaluation (5.089) and potency (4.935) factors was categorized as stimulus group 1 (building numbers 1, 3, 4, 5, 7, 10, and 11). The group of buildings with relatively lower average rating scores

²⁾ The 12 color photographs of Chinese historic buildings were downloaded from the Internet via the Google search engine (Google Images) and slightly modified using Adobe Photoshop. The search process was accomplished mainly by the keywords of Chinese historic building, Chinese traditional building, and Chinese ancient building.

for the evaluation (3.468) and potency (4.174) factors was categorized as stimulus group 2 (building numbers 2, 6, 8, 9, and 12).

A two-way analysis of variance (ANOVA) was performed with stimulus group (stimulus groups 1 and 2) as a within-subjects factor, nationality (Japanese or Chinese participants) as a between-subjects factor, and the rating scores of the evaluation, potency, and familiarity factors as dependent variable. Here, we used the average values of the rating scales rather than factor scores in each factor. The main effect of stimulus group was significant for the evaluation factor ($F(1, 58) = 356.07, p < .001, \eta_p^2 = .86$) and the potency factor ($F(1, 58) = 51.82, p < .001, \eta_p^2 = .47$), but was not significant for the familiarity factor ($F(1, 58) = 0.81, ns$). The main effect of nationality was significant for the evaluation factor ($F(1, 58) = 7.60, p < .01, \eta_p^2 = .12$), the potency factor ($F(1, 58) = 4.75, p < .05, \eta_p^2 = .08$), and the familiarity factor ($F(1, 58) = 48.17, p < .001, \eta_p^2 = .45$). The interaction effect between stimulus group and nationality was also significant for the evaluation factor ($F(1, 58) = 12.15, p < .001, \eta_p^2 = .17$), the potency factor ($F(1, 58) = 7.02, p < .05, \eta_p^2 = .11$), and the familiarity factor ($F(1, 58) = 56.28, p < .001, \eta_p^2 = .49$). Furthermore, this interaction effect indicated that differences between Japanese and Chinese participants were significant for the evaluation factor ($F(1, 116) = 18.58, p < .001, \eta_p^2 = .25$), the potency factor ($F(1, 116) = 11.31, p < .005, \eta_p^2 = .17$), and the familiarity factor ($F(1, 116) = 98.40, p < .001, \eta_p^2 = .63$) in stimulus group 1 (Fig.2a). However, there were no significant differences between Japanese and Chinese participants for the three factors in stimulus group 2 (all *ns*; Fig.2b).

Regarding the familiarity factor, for stimulus groups 1 and 2, respectively, we found differences and no differences in culture-based visual experiences between Japanese and Chinese

participants. These results partially supported our hypothesis. In stimulus group 1, a significant difference was found for each of the three factors. In contrast, no significant differences were observed for any of the three factors in stimulus group 2. According to these results, we posit that differences in evaluation tend to be generated when differences exist in culture-based visual experience, and vice versa. In other words, our findings suggest that culture-based visual experience may affect the evaluation of buildings.

The average rating scores of Chinese participants were significantly higher than those of Japanese participants for the

Table 1
Results of the factor analysis:
Chinese historic buildings.

Adjective pair scale	Evaluation	Potency	Familiarity
Garish – minimalist	.858	.215	-.002
Luxurious – modest	.837	.318	.077
Beautiful – ugly	.798	-.017	.350
Varied – unvaried	.768	-.096	-.111
Complex – simple	.759	.344	-.014
Cheerful – gloomy	.746	-.334	-.051
Impressive – unimpressive	.688	.141	-.004
Favored – disfavored	.685	-.109	.484
Oppressive – open	-.201	.810	-.089
Heavy – light	.293	.749	.306
Solid – slimline	.310	.676	.363
Calm – disturbed	.093	.135	.826
Familiar – unfamiliar	-.136	.113	.709
Eigenvalue	5.336	2.228	1.344
Variance explained (%)	38.361	16.341	13.821
Accumulated variance explained (%)		54.702	68.523

Note. The numbers that correspond to each adjective pair represent factor loadings in the three factors; the bold numbers represent the adjective pairs with the highest factor loadings.

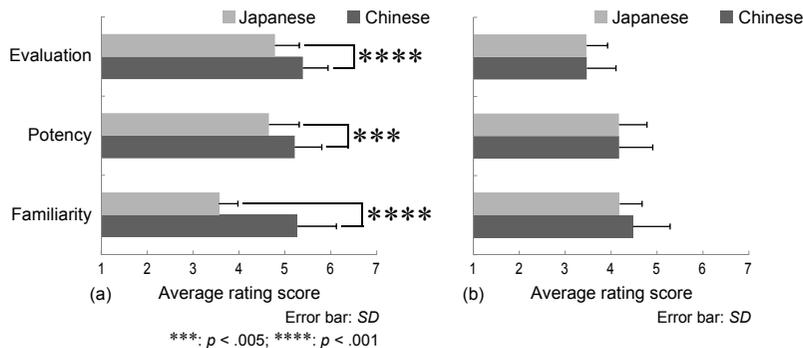


Fig.2 Results of the analysis of variance showing factor-based differences between Japanese and Chinese participants in the evaluation of Chinese historic buildings in stimulus groups 1 (a) and 2 (b).

three factors in stimulus group 1. This suggests that the more culture-based the visual experience possessed by the participants, the higher their overall evaluation of the buildings. In this case, Chinese participants are evidently likely to have more frequent contact with Chinese culture compared with Japanese participants. That is, Chinese participants who have had more culture-based visual experience tended to evaluate the buildings more positively than Japanese participants, whose culture-based visual experience of the buildings was relatively lower. This finding is consistent with that of the mere exposure effect (Zajonc, 1968).

However, we could not clearly explain why no culture-based visual difference was exhibited between Japanese and Chinese participants in relation to stimulus group 2. We will address this issue in Experiment 2.

Experiment 2

For Experiment 2, we applied the same methods as in Experiment 1, but instead used photographs of Japanese historic buildings. In this case, we considered that Japanese participants had more culture-based visual experience than Chinese participants. Based on the results of Experiment 1, we posited that differences in evaluation occur only when differences exist in culture-based visual experience, and more culture-based visual experience could lead to more positive evaluation. Our purpose in conducting Experiment 2 was to verify this postulation in the case of using Japanese historic buildings as stimuli.

Methods

Participants. Thirty Japanese students (19 females and 11 males; mean age = 22.1 years) and 30 Chinese students (18 females and 12 males; mean age = 23.5 years) who were studying in Japan participated in this experiment. None of the students had specialized architectural knowledge.

Materials and stimuli. We used 12 color photographs of Japanese historic buildings (Fig.3) as stimuli.³⁾ The buildings were built or rebuilt during from Kamakura period to Edo period (1331–1868 AD), which were almost the same period as those used in Experiment 1. All of the other materials and stimuli were identical to those used in Experiment 1.

Procedure. The procedure was identical to that of Experiment 1.

Results and Discussion

The factor analysis revealed three factors of the evaluation, potency, and familiarity factors (Table 2) due to the same factor structure as that found in Experiment 1. The cluster analysis

resulted in the categorization of building numbers 1, 2, 5, 6, 8, 9, 10, and 11 within stimulus group 1 with relatively higher average rating scores for the evaluation (4.478) and potency (4.756) factors. In contrast, building numbers 3, 4, 7, and 12 were categorized within stimulus group 2 with relatively lower average rating scores for the evaluation (2.867) and potency (3.703) factors.

The results of ANOVA showed that the main effect of stimulus group was significant for the evaluation factor ($F(1, 58) = 440.88, p < .001, \eta_p^2 = .88$), the potency factor ($F(1, 58) = 124.77, p < .001, \eta_p^2 = .68$), and the familiarity factor ($F(1, 58) = 86.26, p < .001, \eta_p^2 = .60$). The main effect of nationality was not significant for the evaluation factor ($F(1, 58) = 0.85, ns$) and the potency factor ($F(1, 58) = 3.84, ns$), but was significant for the familiarity factor ($F(1, 58) = 4.27, p < .05, \eta_p^2 = .07$). The interaction effect between stimulus group and nationality was significant for the evaluation factor ($F(1, 58) = 5.02, p < .05, \eta_p^2 = .08$), the potency factor ($F(1, 58) = 4.57, p < .05, \eta_p^2 = .07$), and the familiarity factor ($F(1, 58) = 4.12, p < .05, \eta_p^2 = .07$).

Table 2
Results of the factor analysis:
Japanese historic buildings

Adjective pair scale	Evaluation	Potency	Familiarity
Garish – minimalist	.811	.240	-.182
Luxurious – modest	.811	.307	-.024
Varied – unvaried	.758	-.035	-.368
Beautiful – ugly	.754	.083	.297
Cheerful – gloomy	.752	-.289	.007
Complex – simple	.752	.318	-.241
Impressive – unimpressive	.681	.095	-.214
Favored – disfavored	.677	.028	.297
Heavy – light	.260	.776	.159
Oppressive – open	-.180	.774	-.174
Solid – slimline	.492	.630	.262
Calm – disturbed	.050	.127	.796
Familiar – unfamiliar	-.214	-.077	.749
Eigenvalue	5.217	1.885	1.547
Variance explained (%)	37.725	15.198	13.601
Accumulated variance explained (%)		52.923	66.523

Note. The numbers that correspond to each adjective pair represent factor loadings in the three factors; the bold numbers represent the adjective pairs with the highest factor loadings.

³⁾ The 12 color photographs of Japanese historic buildings were downloaded from the Internet via the Google search engine (Google Images), and slightly modified using Adobe Photoshop. The search process was accomplished mainly by the keywords of Japanese historic building, Japanese traditional building, and Japanese ancient building.

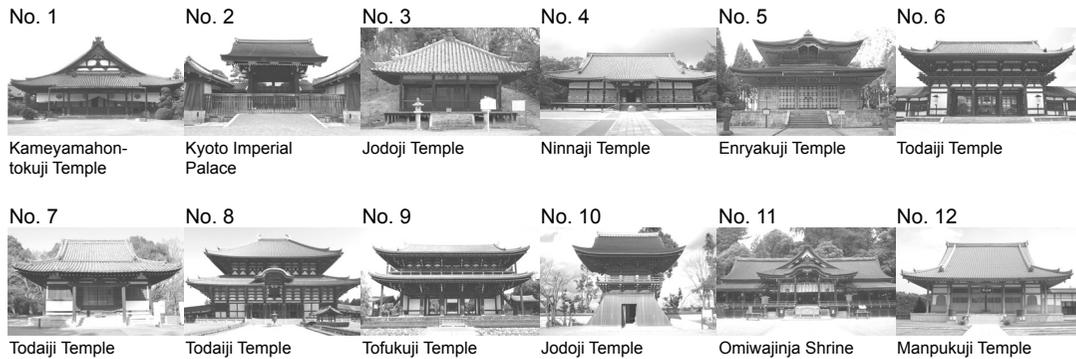


Fig.3 Stimuli composed of 12 color photographs of Japanese historic buildings.

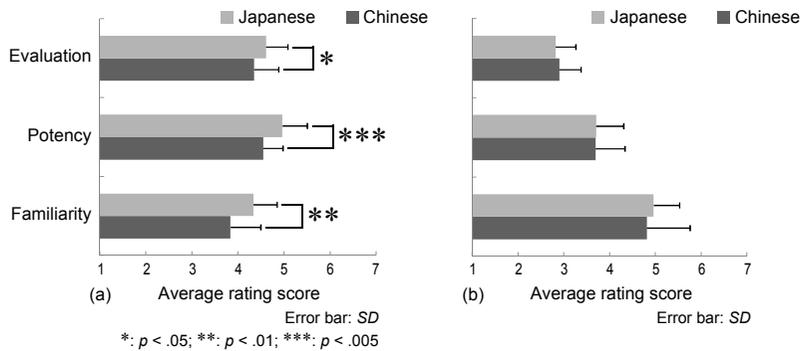


Fig.4 Results of the analysis of variance showing factor-based differences between Japanese and Chinese participants in the evaluation of Japanese historic buildings in stimulus groups 1 (a) and 2 (b).

.07). Moreover, the interaction effect indicated that differences between Japanese and Chinese participants were significant for the evaluation factor ($F(1, 116) = 4.45, p < .05, \eta_p^2 = .07$), the potency factor ($F(1, 116) = 8.29, p < .005, \eta_p^2 = .16$), and the familiarity factor ($F(1, 116) = 7.81, p < .01, \eta_p^2 = .16$) in stimulus group 1 (Fig.4a). However, there were no significant differences between Japanese and Chinese participants for the three factors in stimulus group 2 (all *ns*; Fig.4b).

Adopting the same procedure in Experiments 1 and 2 allowed us to compare their results. The results of the two factor analyses revealed the same factor structures, thus suggesting stability in the evaluations of Japanese and Chinese participants in the two experiments. That is, the participants tended to evaluate the buildings stably and consistently across both experiments, despite the changes in the buildings. Likewise, the same structure resulting from the two cluster analyses further indicates that the photographs of Japanese and Chinese historic buildings could be categorized in a nearly

same way, suggesting that the use of photographs of Japanese and Chinese historic buildings as stimuli was appropriate.

In Experiment 2, the results of ANOVA demonstrated that Japanese participants evaluated the buildings more positively when they had more culture-based visual experience of the buildings. This result was consistent with that of Experiment 1. However, within stimulus group 1, the difference in culture-based visual experience was less than that found in the same group in Experiment 1. This may have occurred because the Chinese participants were studying in Japan, and, therefore, had more contact with Japanese culture, leading to a decrease in differences in culture-based visual experiences between Japanese and Chinese participants.

For stimulus group 1, the results of ANOVA further indicated that the difference in the evaluation factor was less compared with that found in Experiment 1, whereas the difference in the potency factor did not obviously differ from that found in Experiment 1. These findings, therefore, indirectly

provide evidence that while culture-based visual experience could significantly affect evaluation related to aesthetic assessment (the evaluation factor), it may exert a weak effect on one aspect of evaluation (the potency factor) that is closely related to physical properties. In this case, the weak effect on the potency factor might be because relatively objective physical properties of the buildings were difficult to be affected by culture-based visual experience. On the other hand, we propose that aesthetic assessment is related to culture-based visual experience. More specifically, possession of more culture-based visual experience could contribute to more positive ratings of buildings. One previous work appears to support this finding, pointing out that certain cultural triggers that lead to nostalgia facilitate positive attitude (Kusumi, Matsuda, & Sugimori, 2010).

The results of the cluster analyses showed similar impressions within the two respective groups of buildings in both experiments. Based on average rating scores of evaluation and potency factors, buildings in stimulus group 1 in each experiment could be regarded as having good exteriors, whereas buildings in stimulus group 2 could be viewed as having comparatively inferior exteriors.

Differences in culture-based visual experiences for stimulus group 2 were also not significant in Experiment 2. One possible reason for this is that participants in Experiments 1 and 2 may have found it difficult to distinguish the cultural features of buildings in stimulus group 2, which do not appear to be as distinct as those of the buildings with good exteriors in stimulus group 1. Thus, both Japanese and Chinese participants were probably equally familiar with the buildings with inferior exteriors, which led to differences in culture-based visual experiences to be caused difficultly between them.

General discussion

We examined the effects of culture-based visual experience on evaluation of Chinese and Japanese historic buildings from Japanese and Chinese participants. In both experiments, participants evaluated the buildings more positively when they had more culture-based visual experience relating to the historic buildings. However, their impressions of the buildings were nearly the same when no differences in the culture-based visual experience between Japanese and Chinese participants were observed. In addition, we found that culture-based visual experience may have exerted a weak effect on the potency factor associated with physical properties of the buildings, but could significantly affect the evaluation factor related to aesthetic assessment.

Evaluation is often used in association with a Japanese word, *Kansei*. Miura (2007, 2010, 2011) has interpreted *Kansei* as being a quick judgment process based on impression and evaluation. On the other hand, the evaluation process is often accomplished unconsciously along with the integration of information (Miura, 2011). From these interpretations, we can infer that evaluation is a quick process, in which an individual is able to simultaneously integrate information to evaluate objects appropriately. Moreover, during a rapid evaluation process, it is even possible to capture somewhat implicit information about the objects being evaluated. Research has shown that observers evaluate a Japanese rock garden based on its hidden spatial structure (Miura et al., 2011). Therefore, in this study we considered that participants could capture basic information about the impressions of displayed historic buildings and integrate their culture-based visual experiences to appropriately accomplish the evaluation process.

During the evaluation process, in addition to culture-based visual experience, features of the exteriors of the historic buildings were also important. In both experiments, buildings in stimulus group 2 were not evaluated as positively as those in stimulus group 1. In other words, evaluation ratings of the buildings with inferior exteriors are unlikely to be significantly increased simply as a result of culture-based visual experience. Previous work indirectly supports this view, demonstrating that repeated exposure to an object that was initially regarded negatively leads to a decrease in liking (Meskin, Phelan, Moore, & Kieran, 2013; Perlman & Oskamp, 1971; Swap, 1977; Witvliet & Vrana, 2007). These findings support our contention that participants were able to capture the information concerning the impressions of the buildings so as to make appropriate judgments about them.

Nevertheless, there is a concern that more positive evaluations of the historic buildings may have been caused solely by evaluation bias for the buildings located in the participants' own countries rather than being the result of culture-based visual experience. That is, if the participants recognized that the buildings were located in their own countries, some emotional factors such as patriotic sentiment might bias evaluation. This study did not directly speak to this issue. To prevent participants from recognizing the origins of the buildings, we did not give the participants any information about the buildings prior to conducting both experiments. Moreover, *Kansei* is explained as sensitivity to an object and an intuitive judgment regarding vague information (Miura, 2007, 2010, 2011). Thus, the participants were likely to unconsciously accomplish the process of evaluation.

In addition, given that the participants tended to

overestimate buildings in their own countries, the buildings in both stimulus groups 1 and 2 may have been evaluated in this manner independently of the features of their exteriors. However, their impressions of the buildings in stimulus group 2, in both experiments were evidently not as positive as those for buildings in stimulus group 1. Thus, stimulus group 2 in both experiments could have served as control groups, demonstrating that the participants' integration of culture-based visual experience affected evaluation.

Previous study reported that weighted affective valence estimates for both Japanese and American were highly associated with color preference to their own cultures (Palmer & Schloss, 2010). This might be because different cultures often have different color-object associations (e.g., Palmer, Schloss, & Sammartino, 2013). This idea appears to be consistent with our findings that people tend to possess more culture-based visual experience of objects of their own countries, and thus lead to more positive ratings. Furthermore, the effects of culture-based visual experience may be universal across different countries.

To sum up, we conclude that people are able to integrate their culture-based visual experiences into the process of evaluation. We further propose that the results of evaluation depend on how much culture-based visual experience individuals have.

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