

PERCEIVING FACES OF BUDDHA STATUES ON THE RELATION OF VIEWPOINT AND AFFECTIVE EVALUATION

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ABSTRACT

The purpose of this present study is to examine how people perceive and evaluate the ambiguous faces of statues depicting Buddha. We used facial images with two (front and lower) shooting angles taken from 48 statues of the Thousand Armed Kannon at the Hall of the Lotus King (Sanjūsangendō, Kyoto, Japan). In a rating task, participants were asked to evaluate the gender, age, gaze direction, facial expression, and attractiveness of the figures depicted in these statues. In general, the depicted figures were evaluated more often as male than female, and were estimated, on average, to be 40.4 years old. Observers felt more strongly that the Buddha statue was looking at them when it was viewed from a lower-angle than from the front-angle. The perceived facial expression depended on the shooting angle. An expression of 'sadness' was most often perceived in images taken from the front-angle, whereas the perception of 'disgust' was most frequent in images from a low-angle. We also found that observers were more likely to have positive feelings about the statue when the depicted Buddha was evaluated as relatively young in age, manifested less direct eye contact with the observer, and conveyed expressions of 'sadness' or 'happiness' rather than of 'disgust'. These results suggest that people perceive the faces of statues of Buddha in a

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relatively consistent manner and the viewpoint substantially affects the perception of the facial expression. The results also suggest that facial expression, gaze direction, and affective evaluation are all inter-linked.

keywords: facial expression, gaze direction, affective evaluation, Buddha statue

1. INTRODUCTION

Although the ambiguity or ambivalence in facial expressions of Buddhist sculptures in general has been often mentioned as a source of attraction for people, little empirical research exists on perception of faces of Buddha statues. This is partly because the faces (and facial expressions) of most existing Buddha statues vary greatly, as do various features in most types of statues, and this hinders the use of Buddha statues as controlled visual stimuli. We have approached this issue by using pictures of the Thousand Armed Kannon at the Sanjūsangendō Hall (Kyoto, Japan). In the Sanjūsangendō Hall (formally Rengedō-in, or the Hall of the Lotus King), there are one thousand statues of the Thousand Armed Kannon, which are about the light of average human at the time of construction and have notably high inter-statue uniformity (Fig. 1). In the present study, we employed rating tasks to examine how people report perceiving the face of Buddha in these statues and to demonstrate general and specific trends in reported percepts of the statues.



Figure 1: Thousand Armed Kannon at the Sanjūsangendō Hall (Kyoto, Japan)

2. METHOD

2.1. Observers

Observers were recruited from undergraduate and graduate students at the University of Tokyo and Kyoto University. Ninety-four observers (19-28 years old, 56 males) were assigned to a general-evaluation group. In addition, a different set of one hundred and eleven observers (19-28 years old, 43 males) were assigned to an affective-evaluation group.

2.2. Stimuli and Apparatus

Stimuli consisted of facial images of 48 statues of the Thousand Armed Kannon at the Sanjūsangendō Hall. They were photographed with two shooting angles (front, 0° and lower, 14°) and a total of 96 images were used (Fig. 2). Each image was 7.2 cm × 7.2 cm in size and presented individually on a computer screen at a viewing distance of 40 cm.



Figure 2: Examples of facial images of Thousand Armed Kannon, with two shooting angles (front, 0° and lower, 14°).

2.3. Procedure

2.3.1. General-evaluation Condition

This condition comprised two sessions; an initial familiarization session followed by an experimental session. In the familiarization session, all the images were presented sequentially (in time i.e., for 2 seconds each). Presentation order was random. In this session, observers passively viewed the images. The goal was to acquaint observers with the general range of variations among images. In the experimental session, the 96 images were again presented but in a different random order. Observers were asked to evaluate each image with respect to a statue's gender, age, gaze direction, and facial expression. Specifically, they evaluated whether the figure of the statue depicted was male or female (two-alternative forced-choice), how old the figure looked (in the range of 0- to 100-year), how directly the figure looked at the observer (in the 5-point Likert scale; 1 = averted gaze, 5 = gazing straight at observer), and which of six emotions ('sadness', 'happiness', 'anger', 'fear', 'disgust', and 'surprise' [1]) was most clearly portrayed by the figure. To test whether the observer mental state would affect the evaluation, the observers' trait anxiety was measured by the State-Trait Anxiety Inventory [2] after evaluation of all the images.

2.3.2. Affective-evaluation Condition

The procedure for this condition was similar to that for the general-evaluation with two exceptions: First, in this condition, only front-angle images were used. Second, following a familiarization session, observers evaluated the attractiveness of each of the 48 images, using a 9-point Likert scale (i.e., how much they liked a given figure; 1 = dislike, 9 = like).

3. RESULTS AND DISCUSSION

Results from the general evaluation condition revealed several general tendencies (Fig. 3). One trend showed that figures portrayed by the statues were evaluated more often as male (74.40 %, $SD = 16.00$). The estimated age of the portrayed figures was 40.42 years on average ($SD = 9.03$). Relative selection frequencies of different facial expressions were: 'sadness' (31.96 %, $SD = 11.23$), 'disgust' (23.27 %, $SD = 10.29$), 'anger' (20.07 %, $SD = 9.39$), 'happiness' (11.00 %, $SD = 9.46$), 'surprise' (8.96 %, $SD = 7.08$), 'fear' (4.73 %, $SD = 5.74$). The evaluated gaze direction (i.e., how directly the figure was looking at the viewer) was 3.00 on average ($SD = 1.26$) in the 5-point Likert scale (5 = gazing straight at observer). Results also indicated no significant effects of the observers' attributes, such as gender, age, and trait-anxiety scores, on evaluation scores. Finally, results from the affective evaluation condition revealed that the mean affective evaluation of the statues was 4.67 ($SD = 0.71$) for the 9-point Likert scale (9 = most attractive).

Although it has been reported that there is no gender or age definition in these statues in the view of Buddhist doctrines, many Buddha statues were designed to depict males between the ages of 30 and 50 (to represent Gautama Buddha). Our general results are consistent with this description; they demonstrate that when viewing statues of Buddha modern people may have some of the same images and feelings as the sculptors of these statues have had throughout the ages. This may be one of the reasons that these statues have proved so enduring and continue to attract viewers.

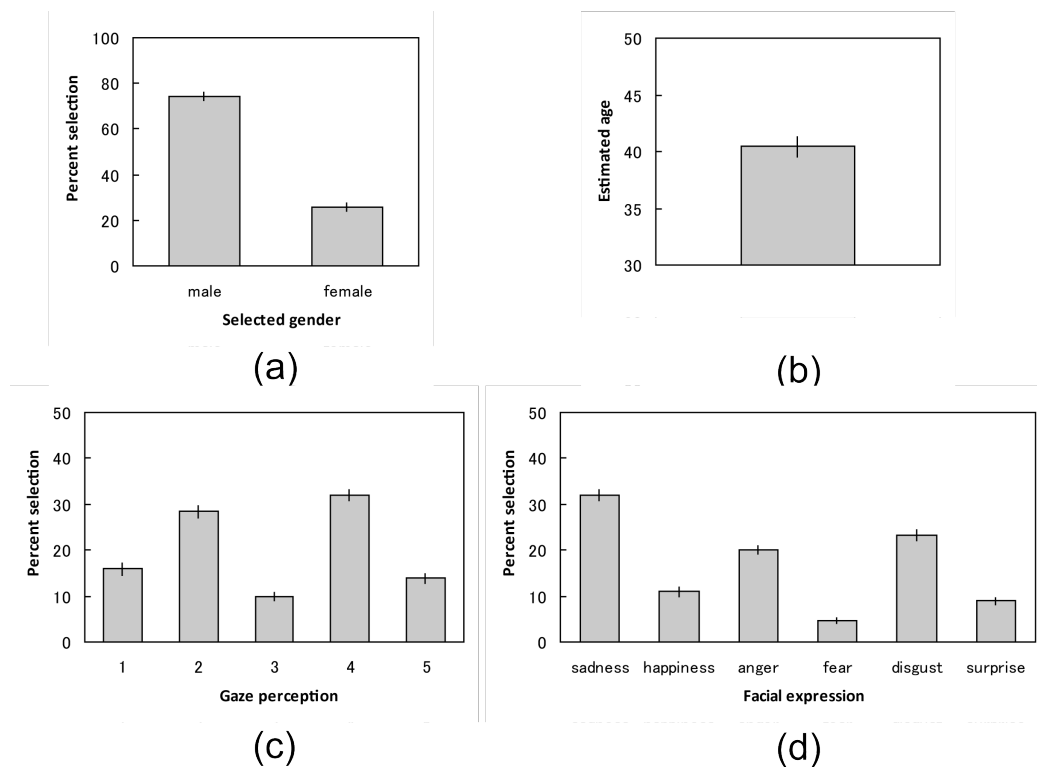


Figure 3: (a) Frequency in gender selection. (b) Estimated age. (c) Evaluated gaze perception . (d) Frequency of perceptions of facial expressions. All with bars indicating the standard error of the mean.

3.1. Effect of viewpoint

Our primary interest concerns effects of viewpoint on perceptual reports in the general evaluation condition. We found a significant difference in reports of gaze perception as a function of viewpoint, i.e., front- and low-angle images. Observers judged the statues' gaze as 'more direct' in the low-angle images than in the front images ($t(93) = 20.36, p < .0001$, Fig. 4a). Notably this difference influenced observers' evaluations despite the fact that the images were taken from identical statues. The figures in the low-angle images were evaluated more often as male ($t(93) = 4.79, p < .0001$, Fig. 4b); they were also judged to be older in low-angle images than they were in the front-angle images ($t(93) = 10.51, p < .0001$, Fig. 4c). For the low-angle images, the frequency of reporting a percept of 'sadness' tended to be lower than that for the front-angle images. In contrast, percepts of 'disgust', 'anger', 'happiness', and 'surprise' were reported more frequently for the low-angle images than they were for the front-angle images ($t_s(93) > 2.30, p < .05$, Fig. 5).

These results show that the established viewpoint, given by a shooting angle, profoundly influenced the observers' perceptions of the statues. In particular, the observers often evaluated the same statues as portraying 'sadness' when viewing the front-angle images, but reported 'disgust' when viewing these as low-angle images. This result is consistent with evidence that the vertical difference in the viewpoint affects the perception of human facial expressions [3][4][5]. Because one factor for this viewpoint effect is considered to be the change in shadow on faces [6], the same principle could be applied to the perceptions of the Buddha's face. As for the other evaluations, observers judged the figures depicted by the statues more often as being both male and older when viewing low-angle images (i.e., versus front-angle images). Furthermore, we found a significant positive correlation between the estimated age and the evaluated gaze direction for each of the shooting angles ($r = .30, p < .05$ for the front images; $r = .42, p < .005$ for the low-angle images); as the observers perceived the gaze of these figures as being more direct, they estimated the age of the depicted figures as being older. These results suggest that gaze perception plays a significant role in judging the gender and age of the depicted figures, as well as in evaluating the expressions of the statues' faces.

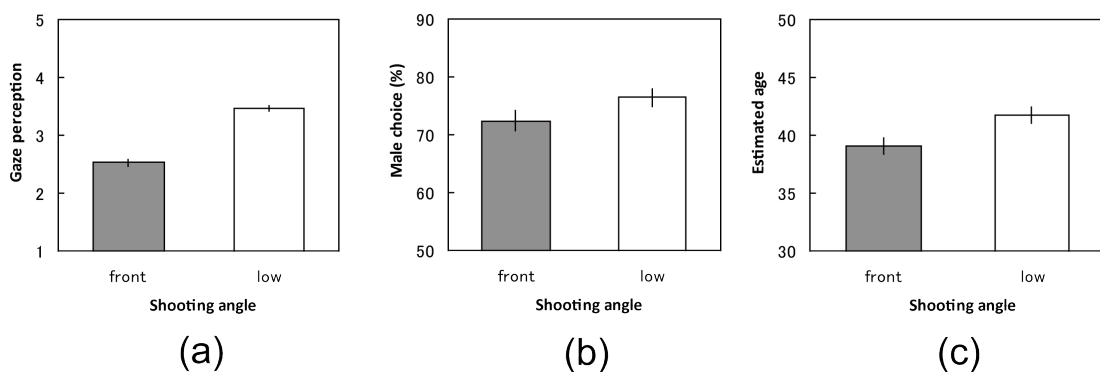


Figure 4: Evaluated gaze perception, frequency in gender selection, and estimated age for each shooting angle, with bars indicating the standard error of the mean.

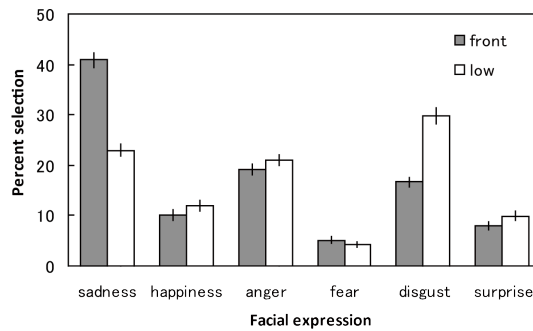


Figure 5: Frequency of perceptions of facial expressions for each shooting angle.

3.2. Correlation with affective evaluation

Finally, we examined correlations between the affective evaluation (i.e., liking) and attributes judged in the general evaluation condition (Fig. 6). Significant negative correlations were obtained between the estimated age and the affective evaluation ($r = -.51, p < .001$) and between the evaluated gaze direction and the affective evaluation ($r = -.40, p < .01$). In other words, if observers liked a certain image of the Thousand Armed Kannon, it tended to be evaluated as younger and as projecting a less direct gaze, or vice versa. With regard to judgments of facial expression, there were significant positive correlations of the affective evaluation with the selection of 'sadness' ($r = .31, p < .05$) and 'happiness' ($r = .41, p < .01$), and a significant negative correlation with 'disgust' ($r = -.55, p < .01$).

These analyses of the affective evaluation with the general evaluation reports reveal that observers tended to like the statues that were evaluated as depicting young figures that did not directly look at them and that conveyed 'sadness' or 'happiness' rather than 'disgust'. These attributes of the statues are largely consistent with the observers' general evaluation for the front-angle images. As described above, the observers evaluated the figures in front-angle images as younger, not having a direct gaze, and more likely to express 'sadness' than 'disgust'. However, it is noteworthy that 'happiness' was an attribute that people perceived more frequently for the low-angle images than for the front-angle images. This discrepancy in the results suggests that the facial expression could independently contribute to the affective evaluation of the faces of the Buddha statues.

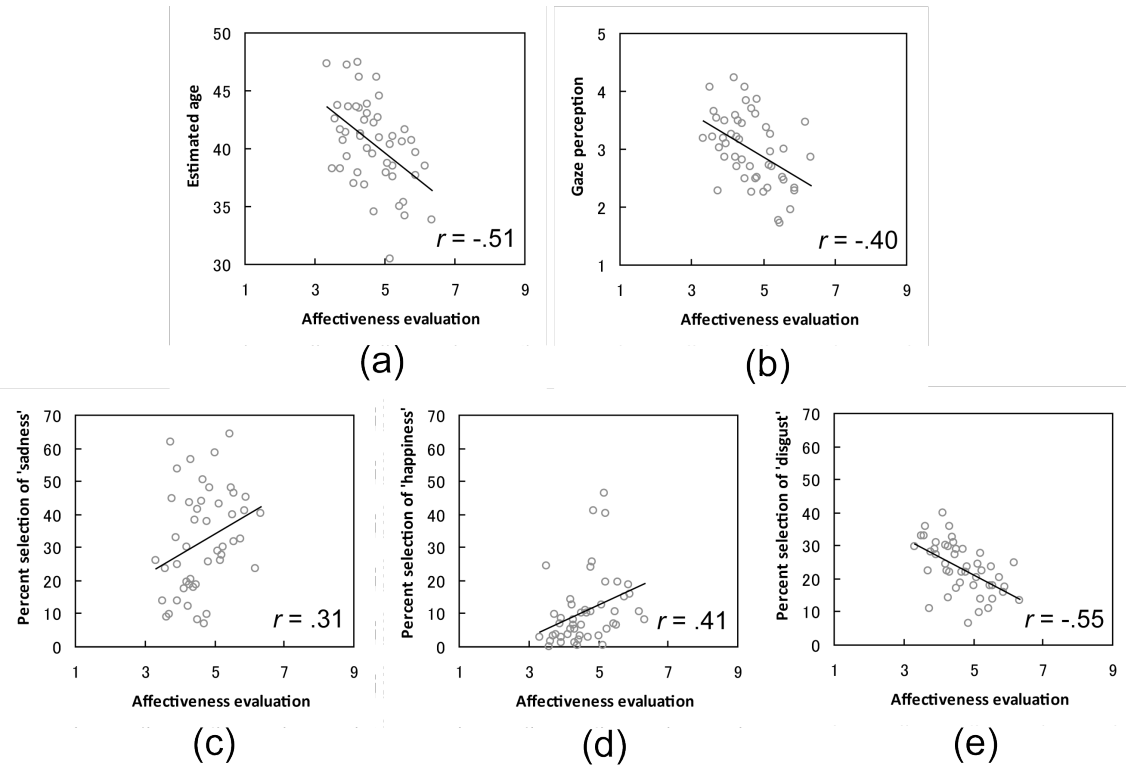


Figure 6: Corrections between attractive evaluation and (a) estimated age, (b) perceived gaze direction, (c) 'sadness' perception, (d) 'happiness' perception, (e) 'disgust' perception.

4. CONCLUSION

The present study examined how people perceive and evaluate the ambiguous faces of Buddha statues through the use of the relatively homogenous sculptures at Sanjūsangendō Hall. Using rating tasks, we found that self-reported perceptions of Buddha's face in the statues were relatively consistent within the examined samples of observers. An identical statue can produce significantly different evaluations due to differences in the viewing angle. Facial expression, gaze direction, and affective evaluation are all related. We expect that this line of research will shed light on how 'kansei' and emotion interact in the perception and evaluation of various artwork, including paintings and sculptures. It would be interesting to investigate whether the patterns of the present findings hold for the reactions of non-Japanese (or non-Asian) observers, for population that are not exposed to much of Buddhist culture, for the perceptions of other Buddhist sculptures (or even other types of sculptures), and for the perception of actual human faces. These investigations are underway.

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