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Why am I not photogenic? Differences in face memory for the self and others

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Abstract. Many people complain that they do not photograph well. In the present study, we hypothesised that the self-face is memorized more beautifully than reality, which may result in reports of being not photogenic. We took photographs of students who were in the same university course and were familiar with one another. We then magnified or shrunk the size of their eyes (Experiment 1; N = 10) and their mouths (Experiment 2; N = 10). We asked the students to select the picture that seemed most like their classmates' real faces or their own real face. The results showed that there were significant differences between memories of their own and others' faces. Participants selected their classmates' real faces to a greater degree than the modified faces. However, participants tended to select pictures of themselves with magnified eyes and shrunken mouths more often than for their classmates. In Experiment 3 (N = 22), more male participants were included and the influence of gender and mirror-reversed images were examined. We found that there were no significant differences across gender, and the mirror reversal did not change the participants' selections. The bias of self-face recognition may reflect different memory processes for the self and others.

Keywords: face recognition, self-face, familiar face, positive evaluation, beauty, gender differences.

1 Introduction

The self-face is one of the most important visual images to people. Most individuals check their faces in the mirror every morning and take opportunities to view themselves throughout the day. Self-face is an important aspect of self-representation. Indeed, numerous studies have shown that individuals are highly sensitive to stimuli relevant to the self. For instance, the self-reference effect, a well-known phenomenon, indicates that information related to oneself is better recalled than other information (Rogers, Kuiper, & Kirker, 1977). For instance, Rogers et al. (1977) asked participants to rate adjectives (e.g., "confident") and then tested their memory on these adjectives. They reported that those words which were rated whether it described the participants themselves were recalled better than did those which were rated whether it was meaningful.

Recent studies in neuroscience have also shown that self-referential processing has dissociable structures from the processing of other information within the brain (e.g., Kelley et al., 2002; Keyes, Brady, Reilly, & Foxe, 2010; Whitfield-Gabrieli et al., 2011), indicating that knowledge about the self is unique. Furthermore, self-advantage has also been observed in face recognition. People respond faster to their own faces than to the faces of others (Keenan et al., 1999; Keyes & Brady, 2000; Tong & Nakayama, 1999), which also may reflect processing differences between the self-face and other-face. Ma and Han (2010, 2012) suggested that the faster response time in processing the self-face was related to implicitly associated positive attributes of self, and positive items are known to be processed faster than are negative items (e.g., Feyereisen, Malet, & Martin, 1986; Osgood & Hoosain, 1983; Stenberg, Wiking, & Dahl, 1998).

We see our faces every day in mirrors, and usually search for ourselves first when viewing a photograph of a group. However, many people complain that their faces look different, and often worse, in photographs. One possible explanation is that a photograph shows a person how others see them, while the mirror image shows the reverse. Other explanations include that a camera lens distorts images of faces by rendering them two-dimensional and static, while mirror images show three-dimensional and dynamic representations. There is empirical support for the latter theory, with faces in videos being rated as more flattering than faces in static images (Post, Haberman, Iwaki, & Whitney, 2012). These theories, however, do not explain why some individuals tend to judge the image of others as more

favorable than the images of themselves. Therefore, we proposed the following: self-face memory is perceived as more beautiful than the real face, whereas other-face memory is more consistent with that of the real face. In other words, when an individual compares their memorized self-face with their face in a photograph, the latter is judged less attractive.

There is empirical evidence that supports this contention: for instance, research shows that self-referential stimuli hold more attention than do other-face stimuli (Devue, Van der Stigchel, Brédart, & Theeuwes, 2009; Turk et al., 2013), which influences self-reference memory. Previous studies of false memories have demonstrated that divided attention reduces false recognition of semantically related words (Dewhurst, Barry, Swannell, Holmes, & Bathurst, 2007); thus, too much attention may generate associated false memories during recognition. Self-focused attention and self-consciousness have also been linked to memory distortions of self-referential information (Djikic, Perterson, & Zelazo, 2005; Walter, 2007). In summary, attention likely increases the certainty of the "made-up mind" and therefore induces a false memory about the self-face.

Furthermore, Ma and Han (2010, 2012) proposed the implicit positive association theory of self-advantage during face recognition, which suggests that people implicitly associate positive information with the self-face. In other words, people tend to have a positive representation of the self, which may create an overestimation of their own beauty in their memory. Indeed, individuals tend to overestimate their abilities when asked to compare themselves to another group, as demonstrated in studies of intelligence (Kruger, 1999).

In the present study, we first examined the hypothesis that people would remember their faces as more attractive than they would perceive their faces in photographs, whereas their memories of others' faces would be more consistent with the others' real faces. Specifically, we predicted that participants would most likely select a photograph that had not been modified for their friends, but would be more likely to choose a photograph of themselves that has more attractive features. To test this hypothesis, we asked participants to select the real face from a set of photographs of themselves or of their classmates. In Experiment 1, we altered (magnified or shrunk) the size of the eyes, while in Experiment 2, we magnified or shrunk the mouths. We then examined gender differences and the influence of mirror-reversed pictures in self-face recognition in Experiment 3.

2 Experiment 1

Research has indicated that the eye region has the greater influence on judgments of face beauty than other parts of the face (e.g., Etcoff, 1999; Kwart, Foulsham, & Kingstone, 2012; Langlois et al., 2000; Thornhill & Gangestad, 1999). Thus, in the first experiment, we adjusted the size of the eyes in photographs to manipulate the perceived beauty of the face. Generally, large eyes are viewed as more attractive, especially in women (Cunningham, 1986). Therefore, we predicted that the participants would select more pictures with magnified eyes for themselves than for their classmates.

2.1 Methods

2.1.1 Participants

Ten Keio University students (7 females, mean age = 20.7 years) from the same class participated in the experiment. The class was held once per week and had been held for three months before the experiment. The participants were from the same department; thus, they regularly met or encountered each other outside the classroom and knew each other relatively well. All participants provided written consent for us to take, process, and reproduce their photographs before participating in the experiment.

2.1.2 Materials

We took photographs of the participants' faces inside the classroom several weeks before the experiment. For each participant, nine photographs were taken from three angles (i.e., front, left-front side, and right-front side), and in front of three different backgrounds (i.e., a white wall, a blackboard, and a monitor). Photographs were edited with Adobe Photoshop CS5.1 using the "liquefy" filter. Eyes in the photographs were magnified or shrunk about 5%, 15%, or 20% (i.e., $\pm$ 3 levels). Thus, seven pictures were made from each photograph, including the unmodified one. We called the seven pictures one set. An example is given in Figure 1 (these pictures were made from a photo of the experimenter and were not used in the experiment). In total, 90 sets of face pictures from the 10 participants were used in the experiment.

(a) (b) (c)

Figure 1. Examples of stimuli used in Experiment 1. The photographs were modified by magnifying or shrinking the eye region by 5%, 15%, or 20%. The participants were asked to select the picture that seemed most like their real face or their classmates' real face. From left to right: (a) face with eye area 10% smaller, (b) unmodified face, (c) face with eye area 10% larger. Photographs were taken by the author.

2.1.3 Procedure

Participants were assessed individually. Before the face recognition task began, participants self-reported how photogenic they perceived themselves to be ("I am not photogenic") on a Likert-scale from 1 (*strongly agree*) to 7 (*strongly disagree*). In each trial of the face recognition task, four pictures randomly selected from each set were lined up on a 22-inch widescreen monitor (resolution: 1680 × 1050 pixels). The participants were asked to use the mouse to select the photograph that was most like the real face of the subject in the pictures. There were a total of 27 trials, including 9 trials of the self-face and 18 trials of the other-face (two sets of each classmate were randomly used). Proportions of the presented faces at each modified level were controlled so that they were equal between the self-face and the other-face. The trials were presented in random order, and the pictures of the faces lined up on the monitor in a random order. The experiment lasted approximately 10 minutes for each participant.

2.2 Results

The selection rates for each type of face picture chosen by the students are given in Figure 2. Angular transformations were applied for analysis. First, we conducted a 2 × 6 analysis[1] of variance (ANOVA: type of face × modification level) to examine the rates of selection. We found a significant main effect of modification level ($F(5, 45) = 40.43$, $p < 0.01$, $\eta_p^2 = 0.82$), and a significant interaction between modification level and type of face ($F(5, 45) = 3.52$, $p < 0.01$, $\eta_p^2 = 0.28$). The type of face main effect was not significant ($F(1, 9) = 1.68$, *n.s.*, $\eta_p^2 = 0.16$). For post-hoc analysis, Fisher's LSD test was used to compare the proportion of selections from each condition. The proportion of the self-face and the other-face selections were significantly different for the unmodified face ($p < 0.01$) and the 5% magnified eyes ($p < 0.05$). The participants were more likely to choose the unmodified faces for their classmates, but selected faces with slightly larger eyes for themselves. Moreover, for the self-face, the selection of the unmodified faces and faces with 5% magnified eyes was significantly higher than other modification levels (p's < 0.05), but these two did not differ from each other ($p = 0.64$). For other faces, the selection of the unmodified faces was greater than all other modification levels (p's < 0.01)

Furthermore, the participants spent more time on self-face trial ($M = 12.1$ s, $SD = 5.5$ s) than on each other-face trial ($M = 8.5$ s, $SD = 2.1$ s) ($t(9) = 2.93$, $p < 0.05$), indicating that they paid more attention to the self-face than to other faces. Finally, the mean score for the 'not photogenic' question was 3.4 ($SD = 1.5$). This value was not correlated with selection or reaction time.

2.3 Discussion

Our proposed hypothesis—that people remember their own faces as being more attractive than their real face and remember others' faces in a less biased fashion—was supported by the results of

[1] No participants selected faces with 20% shrunk eyes (i.e., –3 level), thus only six modification levels were used in the ANOVA.

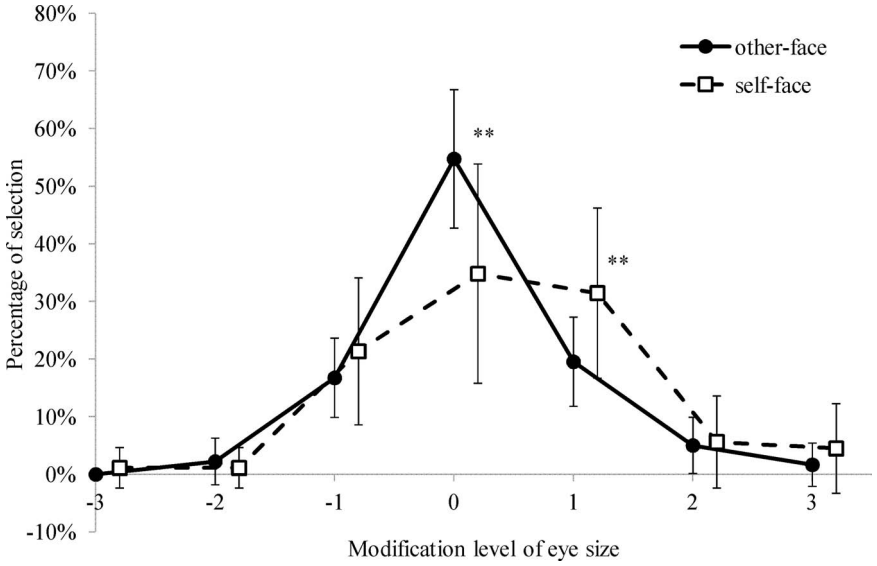

Figure 2. The rates of selection of self-face and other-face in each condition for Experiment 1. Error bars represent standard deviations. Selections of each modification level were compared between the self-face and the other-face photographs. *Note*: ** $p < 0.01$.

Experiment 1. For the other-face condition, about 55% of the selections were of unmodified faces, while the percentage of selections of faces with 5% magnified eyes was 20%, and the selection of faces with 5% shrunken eyes was 17%. This indicates that the participants were able to recognize their classmates' real faces from static photographs in the majority of the trials. However, in the case of the self-face, selection of unmodified faces decreased to 35%, and selection of faces with 5% magnified eyes increased to 32%. Thus, it seems that individuals perceive their eyes as larger than in reality. In other words, they perceive their faces as being more attractive. The differences that emerged in face recognition between the self-face and the other-face appear to indicate that memories of the self-face and the other-face are distinct. This will be further discussed in the General Discussion.

As mentioned previously, empirical results have indicated that people pay more attention to the self-face than to the other-face (Devue et al., 2009; Turk et al., 2013). Our findings provide additional support for this difference in attention as time spent on recognition of the self-face was longer than that of the other-face, possibly indicating that the participants studied their own face more carefully than their classmates' faces. However, the additional attention on the self-face resulted in less accurate face recognition. It may be that excessive attention increased false memory about the self-face.

On the other hand, participants may have simply overestimated the size of their facial features, rather than their beauty. This may have been the result of viewing their own faces at closer distances. Furthermore, it is not clear if memory distortion of the self-face is limited to the eyes or also occurs for other parts of the face. Therefore, we manipulated the size of the mouth instead of the eyes in Experiment 2.

3 Experiment 2

The mouth region is also an important determinant of facial attractiveness (e.g., Cunningham, 1986; Kwart et al., 2012; Russell, 2003). For example, small chins are positively correlated with attractiveness (Cunningham, 1986; Cunningham, Roberts, & Wu, 1995). Moreover, in traditional Asian cultures, a small mouth, thin lips, and a small smile are considered highly attractive (Cunningham et al., 1995; Dalby, 1983). In Experiment 2, we modified the size of mouth similar to the method used in Experiment 1, and once again, we asked participants to select the photograph that looked most like the real face (self or other).

3.1 Methods

The same participants who took part in Experiment 1 took part in Experiment 2. They returned to the testing place approximately two months after the first experiment. Using the original photographs,

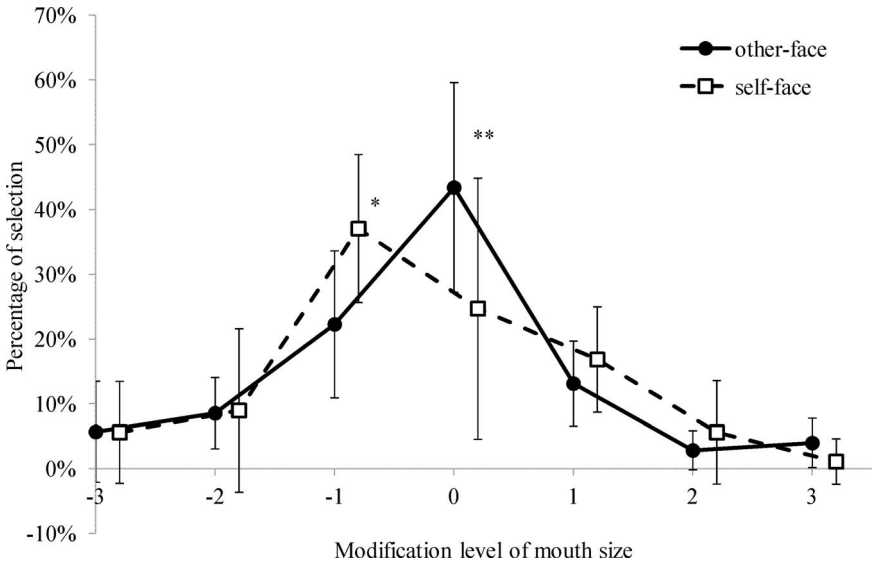

Figure 3. The rates of selection of the self-face and other-face for each condition in Experiment 2. Error bars represent standard deviations. Selections of each modification level were compared between the self-face and the other-face. *Note*: * $p < 0.05$, ** $p < 0.01$.

another 90 sets of face pictures were created with the regions of the mouth magnified or shrunk by 5%, 15%, and 20%. The procedure was the same as that used in Experiment 1.

3.2 Results

The selection rates of each type of face picture by the participants are depicted in Figure 3. As in Experiment 1, we observed significant differences between memory of the self- and other-faces. The results of a 2 × 7 ANOVA (type of face × modification level) revealed a significant main effect for type of face ($F(1, 9) = 6.42$, $p < .05$, $\eta_p^2 = 0.42$) and modification level ($F(6, 54) = 18.25$, $p < 0.01$, $\eta_p^2 = 0.67$). Most importantly, the interaction between type of face and modification level was also significant ($F(6, 54) = 3.65$, $p < 0.01$, $\eta_p^2 = 0.29$). Results of post-hoc tests (Fisher's LSD test) showed that selection rates for of the 5% shrunken mouth and unmodified mouth were significantly different between the self- and other-faces ($p < 0.05$, $p < 0.01$, respectively). Participants chose the unmodified faces of their classmates more often than they did their own; instead, they tended to select faces with the 5% shrunken mouth as their own. Furthermore, for the self-face, selections of the 5% shrunken mouth were significantly higher than any other modification level (p's < 0.05). For other faces, selections of the unmodified mouth were significantly more than those with other levels of modification (p's < 0.01). The main effect for type of face showed that the selections for the other-face were more than the selections for the self-face, which was a result of angular transformation (the total selections for all modification levels should be 100% for the self- and other-faces). In addition, as in Experiment 1, reaction time in the self-face condition ($M = 9.3$ s, $SD = 2.1$ s) was significantly longer than that in the other-face condition ($M = 8.0$ s, $SD = 1.7$ s; $t(9) = 2.69$, $p < 0.05$).

3.3 Discussion

The results from Experiment 2 replicated the findings of Experiment 1. In Experiment 2, the unmodified faces of classmates were selected in 43% of trials, the unmodified self-faces were selected only 25% of the time. Moreover, the 5% shrunk mouth photographs were selected for 35% of the self-face trials. We reached two conclusions from the results of Experiment 2: first, individuals do not simply overestimate the size of their facial features (they underestimated the size of their mouths), and second, memory distortion of the self-face occurs with other parts of the face.

4 Experiment 3

Previous studies have reported gender biases in face recognition. For example, female participants recognized female faces better than male faces (e.g., Cross, Cross, & Daly, 1971; Lewin & Herlitz,

2002; Rehnman & Herlitz, 2006; Rehnman & Herlitz, 2007; Wright & Sladden, 2003). The judgment of beauty may also differ between men and women (e.g., big eyes may be viewed to be attractive for the female face, but not for the male face). Therefore, there are reasons to expect gender differences in the bias of self-face recognition. We were unable to examine gender difference in Experiments 1 and 2 due to the small number of male participants. In Experiment 3, we increased the number male participants and balanced genders of the other-faces. In addition, we also examined whether a mirror-reversed self-face (as one sees in mirror) influenced the self-face recognition bias.

4.1 Methods

4.1.1 Participants

Twenty-two participants (12 females, mean age = 22.9 years) from Keio University took part in this experiment. They were from the same department as the participants in Experiments 1 and 2, but none of them had taken part in the previous two experiments. The participants in this experiment knew each other, but were not as well known to each other as the participants in Experiments 1 and 2. Therefore, in the present experiment, we defined "others" as *known people* rather than *familiar people*.

4.1.2 Materials

The face photographs used in Experiment 1 were also used in this experiment. In addition, we took photographs of four other male students in the same department, which resulted in photographs of seven men and seven women. All photographs were edited in Adobe Photoshop CS5 as in Experiment 1 (eyes magnified or shrunk by ± 3 levels). These prepared pictures were used in the other-face condition. For the self-face condition, face photographs were taken and edited just before the experiment. The self-face pictures were only used with the matched participant. In addition, pictures of mirror-reversed self-faces were made of each participant with the same software.

4.1.3 Procedure

Participants performed the experiment individually. Before the task, participants were shown an A-4 sheet of face photographs used as other-faces were printed (one unedited picture for each person) and were asked to indicate the individuals they did not know. Only pictures of known people were used in the face recognition task.

For each participant, nine face photographs were taken, and the experimenter edited the pictures while the participants waited for about 25 minutes. When the edit was complete, participants returned to the experiment room and performed the same face recognition task described in Experiment 1 twice. Normal and mirror-reversed pictures of self-face were used in the first and the second session, respectively. There were 36 trials in each session, including 18 self-face and 18 other-face trials. The other-face photographs were randomly chosen from known people and proportion of gender was controlled. The experiment lasted approximately 1 hour for each participant, including the waiting period.

4.2 Results

The rates that men and women selected each type of face picture are given in Figure 4. We applied a mix-designed $2 \times 2 \times 7$ ANOVA (gender of participants $\times$ type of faces $\times$ modification level) to examine gender differences. An angular transformation was applied for the analyses. We found significant main effects of gender, type of faces, and modification level ($F(1, 20) = 6.52$, $p < 0.05$, $\eta_p^2 = 0.25$; $F(1, 20) = 18.60$, $p < 0.01$, $\eta_p^2 = 0.48$; $F(6, 120) = 62.20$, $p < 0.01$, $\eta_p^2 = 0.76$, respectively), and a significant two-way interaction between type of face and modification level ($F(6, 120) = 4.84$, $p < 0.01$, $\eta_p^2 = 0.19$). The gender of participants was not significantly interacted with any other factor ($F(1, 20) = 0.36$, *n.s.*, $\eta_p^2 = 0.02$ for the two-way interaction between gender and type of faces; $F(6, 120) = 0.84$, *n.s.*, $\eta_p^2 = 0.04$ for the two-way interaction between gender and modification level; $F(6, 120) = 1.03$, *n.s.*, $\eta_p^2 = 0.05$ for the three-way interaction between gender, type of faces, and modification level). The significant main effect of gender was a result of the angular transformation (the total number of selections by men and women was equal before transformation, but, after transformation, the total number of selections by women was more than the total number of selections by men). Post-hoc comparisons (Fisher's LSD test) showed that the participants selected more pictures with 5% magnified eyes ($p < 0.01$) and fewer pictures with 15% magnified eyes ($p < 0.01$) for the self-face than for the other-face. In addition, we also examined if the gender of other-face influenced facial memory. A mixed-designed $2 \times 2 \times 7$ ANOVA (gender of participant $\times$ gender of other-face $\times$

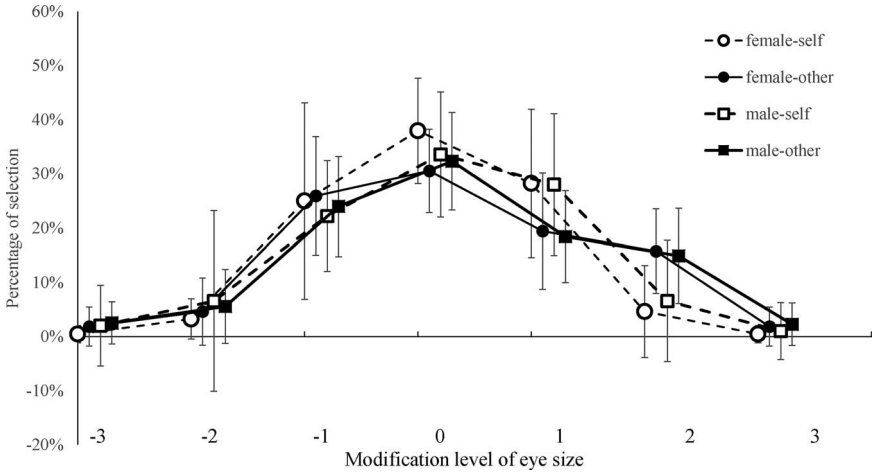

Figure 4. The rates of selection of self-face and other-face with non-reversed pictures by women and men in each condition for Experiment 3. Error bars represent standard deviations.

modification level) revealed only a significant main effect of modification level ($F(6, 120) = 39.66$, $p < 0.01$, $\eta_p^2 = 0.66$) but no any significant interaction. In summary, neither the gender of participants nor the gender of other-face interacted with other factors (i.e., type of faces, modification level).

Furthermore, we applied the same ANOVA (gender of participant × type of faces × modification level) to the results of the mirror-reversed session (Figure 5) and found almost the same results as the first session. Specifically, we found main effect of type of faces and main effect modification level, and a significant two-way interaction between type of faces and modification level ($F(1, 20) = 60.37$, $p < 0.01$, $\eta_p^2 = 0.75$; $F(6, 120) = 60.43$, $p < 0.01$, $\eta_p^2 = 0.75$; $F(6, 120) = 12.24$, $p < 0.01$, $\eta_p^2 = 0.38$, respectively). Moreover, we added the factor of session into the above ANOVA to examine the effect of session (normal vs. mirror-reversed); neither the main effect of session nor any interaction between session and other factors was significant, revealing that mirror-reversed pictures did not influence face recognition. In fact, none of the participants reported noticing that mirror-reversed pictures were presented in the second session when asked after the experiment.

4.3 Discussion

In this experiment, we examined influences of gender and mirror-reversed pictures on the observed bias in self-face recognition; neither gender nor mirror-reversed pictures affected recognition of the

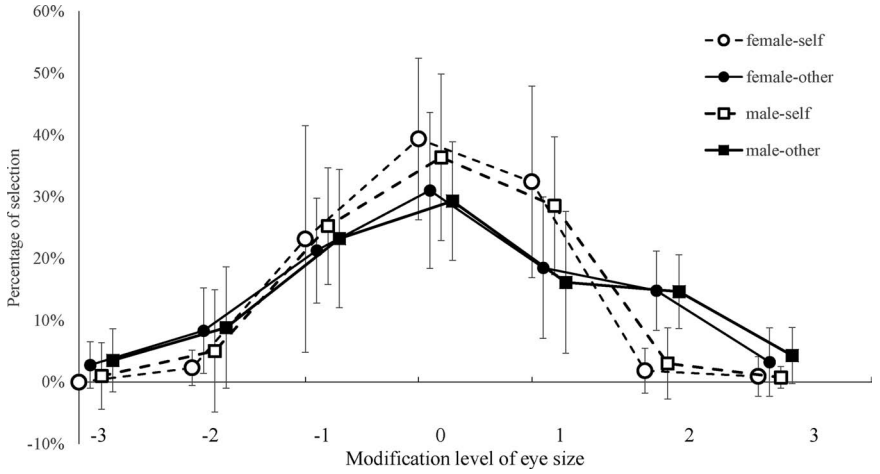

Figure 5. The rates of selection of self-face and other-face with mirror-reversed pictures by women and men in each condition for Experiment 3. Error bars represent standard deviations.

self-face and other-face. Although some previous studies have reported gender biases in face recognition (e.g., Cross et al., 1971; Lewin & Herlitz, 2002; Rehnman & Herlitz, 2006; Rehnman & Herlitz, 2007; Wright & Sladden, 2003) and features influencing beauty might differ between women and men, we did not observe any gender difference in the memory distortion in self-face memory. Both women and men selected more pictures with 5% magnified eyes for themselves than for other people, and the gender of the other-face did not influence recognition.

As mentioned in the Introduction, there is possibility that because we view our faces in a mirror and faces are flipped horizontally in photographs, they appear different. We examined this and found that the answer was "not true." None of the participants noticed the presentation of mirror-reversed pictures, and showing mirror-reversed pictures did not influence their recognition. This is probably because people are very familiar with their self-face in both mirrors and photographs. As shown in a previous study, people's ability to recognize whether their own face is mirror-reversed or not is no better than their ability to recognize others' mirror-reversed faces (Brédart, 2003). Although the difference between the dynamic face in the mirror and the static face in a photograph might influence attractiveness, left and right reversal does not.

The results from Experiment 3 differ from those of Experiment 1 in two ways. First, selections on unmodified pictures were equal for self- and the other-faces in this experiment, but less for self than other in Experiment 1. Second, the selection of pictures with 15% magnified eyes was less for self than for others in this experiment, but was the same in Experiment 1. These differences may have arisen due to the differences in participants and procedures. In Experiment 1, all the participants were in the same small-class lecture and were very familiar with each other. In contrast, the participants in Experiment 3 were from the same department but in different years; they knew each other, but were not that familiar with the others in the photographs, resulting in poorer performance in face recognition of the other-faces. Furthermore, photographs of the self-face were taken just before the experimental task in Experiment 3, possibly resulting in better accuracy in self-face recognition than in Experiment 1. However, the result that significantly more faces with 15% magnified eyes was selected for other people than selected for self was still somewhat surprising. This suggests that people may be more generous with unfamiliar people. Future research should be conducted on this issue.

5 Experiment 4

To confirm that the size of eyes and mouth influences attractiveness for both Japanese men and women, we asked students who did not know the participants of Experiments 1, 2, and 3 to select the most attractive face from pictures with different sizes of eyes or mouths.

5.1 Methods

5.1.1 Participants

Twenty students from the University of Tokyo and the Chuo University participated in Experiment 4. Ten students (5 females, mean age = 22.5) participated in the investigation on attractiveness of faces with different sized eyes, and the others (5 females, mean age = 26.0) participated in the investigation on attractiveness of different sized mouths. None of these participants knew the participants of the previous experiments and were naïve to the purpose of the experiment.

5.1.2 Materials and Procedure

The other-face photographs in Experiment 3 were used. All photographs were edited in Adobe Photoshop CS5 as in Experiment 1 (eyes magnified or shrunk by ± 3 levels) and Experiment 2 (mouths magnified or shrunk by ± 3 levels). In each trial, seven pictures with different sized eyes (the first investigation) or mouth (the second investigation) were randomly presented on a monitor, and participants were asked to select the most attractive one using a mouse. For each other-face subject, three sets of photographs were used randomly. Each participant did 42 trials (3 sets $\times$ 14 subjects).

5.2 Results

The proportions of face selections of pictures of women and men with different sized eyes are given in Figure 6(a). Women and men both favored larger eyes, although the degree was somewhat different (larger eyes were favored in women more than in men). The average correlation between the proportions of selections and modification levels were .76 (SD = .14) for female faces and .71 (SD = .17)

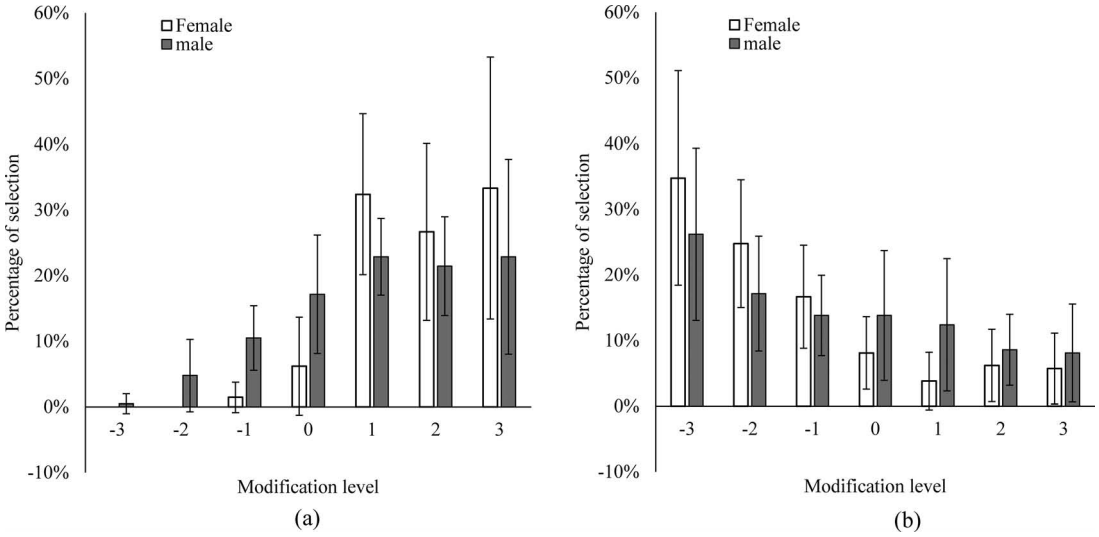

Figure 6. The rates of selection of the most attractive face from pictures with different sizes of eyes (a) or different sizes of mouth (b) for women and men. Error bars represent standard deviations.

for male faces. A Fisher's z-transformation was applied for the analyses. The correlations significantly differed from 0 for both female faces ($t(9) = 7.59, p < 0.01$) and male faces ($t(9) = 8.17, p < 0.01$). The difference between female faces and male faces was not significant ($t(9) = 0.63$, *n.s.*).

The proportions of selections of pictures with a different sized mouth are given in Figure 6(b). Faces with smaller mouths were selected as attractive, and this tendency was more remarkable for female faces. The average correlations between the proportions of selections and modification levels were –.75 ($SD = .12$) for female faces and -.49 ($SD = .34$) for male faces. Both correlations were significantly different from 0 ($t(9) = -9.36, p < 0.01$; $t(9) = -3.86, p < 0.01$, respectively). Furthermore, the correlations did not differ significantly between female and male faces ($t(9) = 1.82$, *n.s.*).

5.3 Discussion

In this experiment, we asked the participants to select the most attractive face from pictures with different sized eyes or mouths. The results clearly showed that large eyes and small mouths were viewed as more attractive, especially in women, in Japanese culture. Therefore, when people selected pictures with larger eyes or smaller mouths for the self-face, they were remembering their own faces as more attractive than their real face.

6 General Discussion

The results from Experiment 1 and 2 provided clear evidence that there are differences in face memory for the self and others. Specifically, participants were able to recognize the unmodified faces of their classmates, but tended to choose the modified pictures (with larger eyes and smaller mouths) of their own faces. As confirmed in Experiment 4, larger eyes and smaller mouths are considered to be more attractive in Asian cultures; therefore, these results may be interpreted to mean that people think of themselves as more attractive than they really are. This may also provide an explanation for why many individuals think they are not photogenic: when people see their photographs—an unmodified view—they compare it to their memorized face, and the resulting incongruence is attributed to a poor photograph or being "not photogenic."

Herein, we have proposed several possible reasons for the memory distortions of the self-face. The memory distortions we observed may be the result of over-attention to the self-face. Indeed, previous work has indicated that self-reference stimuli, including faces, hold attention more than other stimuli (e.g., Devue et al., 2009; Turk et al., 2013). After the experiments, the participants reported that the self-face trials were easier to do than the other-face trials, but they took longer during these trials. Although the participants made more cautious decisions during the self-face trials, their recognitions were less accurate. Therefore, it may be that too much attention and overexposure to the self-face

may result in the subjective expectation of being more attractive. In addition, as reported by prior researchers, people implicitly associate positive information to the self-face (Ma & Han, 2010, 2012). Thus, during the long retention interval of the self-face, positive information (e.g., beauty, attractiveness) associated with the self may unconsciously distort an individual's self-representation and lead to inaccurate face recognition. In addition, the positive biases of self-face recognition might not be specific for self-face recognition; it might also apply to the faces of people to whom we are strongly attached. Future research should be conducted on this issue.

Furthermore, previous research has demonstrated that holistic processing leads to better face recognition than featural processing (e.g., Schooler & Engstler-Schooler, 1990; Schooler, 2002). In research examining self-face processing relative to familiar face processing, featural processes have been demonstrated to contribute to the self-face recognition (e.g., Greenberg & Goshen-Gottstein, 2009; Brédart, 2003). In addition, Keyes and Brady (2010) examined interhemispheric cooperation in the recognition of self-, friend-, and stranger-faces, and concluded that the representation of one's own face emphasizes both global and local information. From the results of these studies we infer that the featural processing of the eyes (or the mouth) in this study was influenced by positive beliefs about self.

We also examined the interaction between gender and bias in self-face memory, but did not observe any gender differences. Both women and men chose slightly magnified eyes for the self-face more often than for others. As shown in Figure 6(a), although large eyes were preferred more in women than men, this feature was correlated with attractiveness for both genders. In conclusion, both females and males remember their own faces as being more attractive than their real face.

We also examined the influence of mirror-reversed pictures on self-face recognition and found that the photograph selections were not influenced by mirror-reversals self-faces. The participants reported not noticing the difference in the mirror-reversed photographs. Clearly, mirror-reversal is not the reason of why faces look different in photographs and mirrors.

In conclusion, we found a bias in self-face recognition. Participants selected the more attractive, modified pictures for the self-face condition than for the other-face condition. This phenomenon did not differ across gender and indicated a memory distortion (i.e., overevaluation) of the self-face and offered some insight about how people think about the self.

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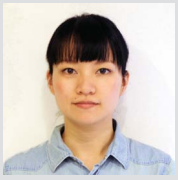

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