

## Left bias of gaze perception in a cartoon face

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Comparing a cartoon face drawn by the author with its mirror image, asymmetry of gaze perception or a left bias was revealed, whereas the inverted faces showed no bias. This novel finding is discussed.

*Key words:* gaze perception, face, asymmetry, illusion, left gaze bias

This article reports a novel gaze-perception bias. Figure 1a shows a face that appears to look at viewers but appears to look leftward in the mirror image (Figure 1b). I report a brief survey that confirms these claims.

### Methods

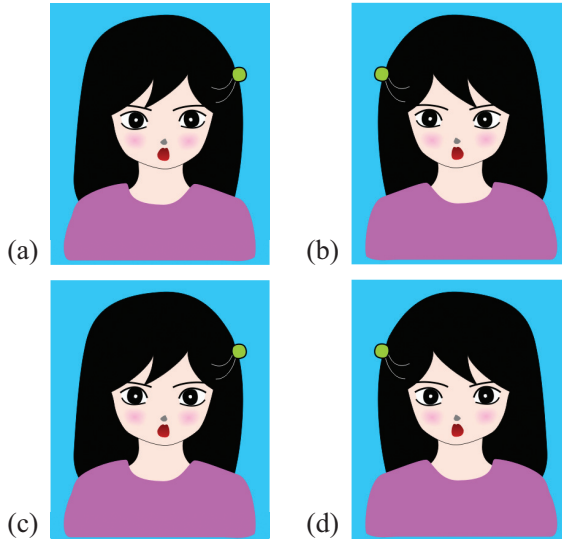
The test stimuli were the original image (Figure 1a), its mirror image (Figure 1b), the image in which only the eyes were mirror-reversed (Figure 1c), the image in which all but the eyes were reversed (Figure 1d), and their inverted images. Figure 1d is the mirror image of Figure 1c. This survey was conducted in a course (“Outline of Psychology I (L),” Ritsumeikan University in 2011). Questionnaires were distributed and collected anonymously. Those who did not wish to participate in this survey were asked to return the questionnaire blank or filled imperfectly. There were 146 participants. The results were returned to the students for discussion in the next lecture.

In the questionnaire, participants were asked to select one from the following seven items: “The person appears to look leftward” (scored –3), “The person appears to look slightly leftward” (scored –2), “The person nearly appears to look at you and sometimes appears to look slightly leftward” (scored –1), “The person appears to look at you” (scored 0), “The person nearly appears to look at you and sometimes appears to look slightly rightward” (scored 1), “The person appears to look slightly rightward” (scored 2), and “The person appears to look rightward” (scored 3).

### Results

The mean score Figure 1a was 1.14 (SD 0.87) and of Figure 1b was –1.84 (SD 0.96). In absolute numbers, the latter was larger ( $t(145) = 7.86, p < .01$ ). Moreover, the mean score Figure 1c was 0.05 (SD 0.63) and of Figure 1d was

-0.83 (SD 0.89). In absolute terms, the latter was larger ( $t(145) = 9.64, p < .01$ ). The inverted images had no statistical asymmetry.



*Figure 1.* Test images. (a) The original image. (b) The mirror image of the original. (c) The eyes are the mirror image, while the rest are the same as the original. (d) The eyes are the same as the original, while the rest are the mirror images. (d) is the mirror image of (c). The tested, colored images are available at: <http://www.psy.ritsumeai.ac.jp/~akitaoka/leftbiaspaper.html> (Online in color.)

### Discussion

This study revealed an asymmetry — a left bias in gaze perception — in a cartoon face. In Figure 2, the mirror-reversed Mona Lisa appears to look more sideways than the original. This observation is, however, inconsistent with Todorović (2006) because he reported that the mirror image of Mona Lisa appeared to look at observers.



*Figure 2.* Mona Lisa (left) and its mirror image (right). The mirror image appears to look more sideways than the original. (Online in color.)

A similar term “left gaze bias” was previously given by Guo et al. (2009) to the tendency that viewers to look at the left hemiface (the right side of the looker’s face) first and/or for longer periods (Butler et al., 2005; Mertens, Siegmund, & Grusser, 1993). That is, this term refers to the viewer’s gaze, not to the gaze of the face being inspected. Moreover, the left hemiface is known to be more used for facial information (Burt & Perrett, 1997; Gilbert & Bakan, 1973; Wolff, 1933). A left bias in gaze perception might reflect reliance on the left hemiface. Using only the left hemiface, a symmetrical face with convergent eyes would look rightward from the viewer’s perspective because the right iris of the face under inspection shifts from toward the nose (Figure 3). However, the author’s impressions of Figure 3 disconfirm this prediction.

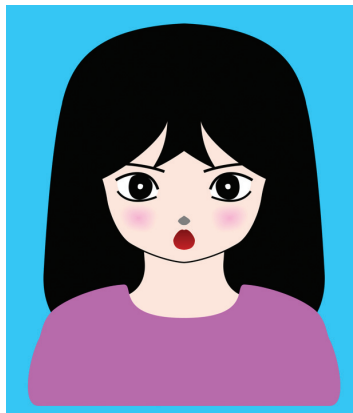


Figure 3. A symmetrical face made up of the left half of Figure 1a. If the left side dominates the perception of gaze direction as suggested by the left gaze bias or the reliance on the left hemiface information, this face should appear to look rightward because this looker’s right iris shifts toward the nose. But this is probably not the case. (Online in color.)

A left bias in gaze perception would be a gaze illusion along with the Mona Lisa effect (Bruce & Young, 1998; Maruyama, Endo, & Sakurai, 1985; Todorović, 2009), the Wollaston effect (Gibson & Pick, 1963; Langton, Honeyman, & Tessler, 2004; Todorović, 2006; Wollaston, 1824), the face eccentricity effect (Todorović 2009), the luminance-induced gaze shift (Ando, 2002, 2004), the gaze shift in the direction opposite to the turn of the head (Anstis, Mayhew, & Morley, 1969; Gibson & Pick, 1963; Masame, 1990), etc. The present gaze illusion involves an unexplained asymmetry. The asymmetry in gaze may be to do with the asymmetrical facial parts in Figure 1a, but the reason for the mirror-image having a more pronounced sideways gaze (leftward) is unclear.

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