
AMERICAN JOURNAL OF PSYCHOLOGICAL RESEARCH

Volume 2, Number 1
Submitted: March 3, 2006
First Revision: May 31, 2006
Accepted: June 1, 2006
Publication Date: June 8, 2006

Perception of Traits from Normal, Mirror and Chimeric Images of Faces

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ABSTRACT

Two studies examined the extent to which familiarity and facial image type influenced judgments about personality traits. Faces of strangers were judged more neurotic and less attractive than either the self or a friend. Chimeric images of two left sides of faces received higher ratings for attractiveness, agreeableness, and health. Results are discussed in terms of bilateral neural processing.

INTRODUCTION

While we use many cues to form impressions of others, a person's face remains one of the most salient, providing information about gender, ethnicity, age, and perhaps more subtle aspects of the individual such as health, mood, and personality. Certainly, one of the first judgments we make about a face is its degree of attractiveness. Cross culturally, symmetry of facial features, or the degree to which the two sides of the face match, is a primary determinant of attractiveness (Mealey, Bridgstock, & Townsend, 1999). Indeed, facial symmetry is associated with many positive traits. Noor and Evans (2003) found that symmetrical female faces were rated less neurotic, more agreeable, and more conscientious than asymmetrical ones. Symmetry may even provide a marker for health and fertility (Zaidel, Aarde, & Baig, 2005).

Another potent factor in the evaluation of faces is familiarity. In general, the more often we have seen a person the more favorably we rate them (Zajonc, 1968). Even

when interaction is minimal, repeated exposure leads to increased liking (Moreland & Beach, 1992). This familiarity effect even includes self-perception. Since most of our knowledge of our own face is from mirror images which reverse right and left sides we tend to prefer this image over the view others see (Brady, Campbell, & Flaherty, 2005).

This preference may also relate to neural processing. Brady et al. (2004) found that while people chose chimeric images of the two left sides, that is, the right mirror images, of their own faces as looking most like themselves, they chose a right-sided chimeric face as looking more like a friend. In both instances the chosen side is processed by the right hemisphere of the brain which is consistent with Butler et al.'s (2004) finding that neural processing of faces occurs mainly in the right hemisphere. Additional studies indicate right hemisphere dominance in judging emotions, especially negative ones such as fear and anger (Asthana & Mandall, 2001; Canli, 1999; Canli, Desmond, Zhao, Glover, & Gabriele, 1998; Davidson, Schwartz, Saron, Bennett, & Goleman, 1979; Levy, Heller, Banich, & Burton, 1983). Perhaps the initial processing of faces focuses on negative emotional cues since early recognition of angry or frightened faces could be important for survival. In a classic study, Hansen and Hansen (1988) found that one angry face embedded in a sea of neutral faces was recognized more quickly than a happy one.

Since Roger Sperry's (1974) dramatic announcement of lateralization of function in the brain, researchers have tried to localize abilities and personality traits. The right brain has been associated with neuroticism (Carlstedt, 2002; Schmidt, 2000) as well as creativity (Fisher, Mohanty, Koven, Miller, & Heller, 2004; Kingery, 2004; Martindale, Hines, Mitchell, & Corello, 1984; Weinstein, 2001; Weinstein & Graves, 2002). In contrast, studies indicate left brain links for extraversion (Berenbaum, 1994).

If there is hemispheric lateralization of individual traits such as creativity, extraversion, and neuroticism, it may be that the two sides of the face reflect these traits differentially and that judgments about the traits can be based on these facial cues. Thus, any traits residing in the left brain would be reflected in the right side of the face and vice versa. That is, if extraversion lies in the left brain and neuroticism and creativity in the right, then chimeric faces of two right sides would be judged as more neurotic than other facial images and two left sides would be seen as more extraverted and creative. The present studies test the degree to which mirror or chimeric images of faces and familiarity influence judgments of various personality traits.

EXPERIMENT 1

Method

Participants. Sixteen female college students from a small liberal arts university volunteered to participate in the study in return for extra credit in a psychology course. Each brought a friend, another female college student, with her.

Procedure. Individual full-face photographs were taken of all 32 individuals from a distance of six feet. Participants were instructed to maintain neutral expressions.

The black and white photographs were then manipulated electronically to remove any background and to create four images, normal, mirror, chimeric right-side images, and chimeric left-side images. These four images of the self, the friend, and a stranger were loaded onto computers which had been programmed to present the twelve photographs in random order.

Using a Likert scale with one being strongly agree and five being strongly disagree, participants rated each image on five traits: creative, attractive, extraverted, neurotic, and agreeable. After all images had been evaluated, subjects were asked to decide if they had seen a face before. Reaction times were recorded for judgments of having seen each of the twelve original images and twelve new images of strangers. The computer also recorded whether the responses were accurate or not.

Results

Analyses of variance were conducted on the data. Although image type (normal, mirror, left/left, or right/right) did not influence judgments of attractiveness, $F(3, 204) = 1.67, p = .174$, subject (self, friend, stranger), $F(2, 204) = 18.20, p = .003$, did affect the ratings. Tukey's pairwise comparisons revealed that the friend was rated more attractive than the stranger, $F(2,204) = 6.34, p = .002$. In addition, subject had a significant effect on the ratings of neuroticism, $F(2, 204) = 10.12, p = .012$, with the friend rated less neurotic than the stranger, $F(2,204) = 3.65, p = .028$. The only significant difference in the reaction times to recognize faces was that new faces took longer, $F(1,862) = 3.97, p = .047$. No other results were significant.

Discussion

The failure to find significant results for image type in this experiment is attributed to the use of a within-subject's design. Participants easily recognized that the various face types were the same person and were able to duplicate their previous ratings on the adjectives. The evaluation of the stranger as less attractive and more neurotic than the friend probably relates to the tendency to rate unfamiliar persons more negatively than familiar ones.

EXPERIMENT 2

Method

Participants. Forty volunteers, ranging in age from 15 to 75, participated in this study. None was acquainted with the people in the photographs.

Procedure. Selecting 12 of the original photographs, four booklets were created, one of each image type. Booklet A had normal views of the 12 individuals; Booklet B had the mirror images of the same people; C contained chimeric images of the two right sides of the faces; and D the two left sides. Participants were randomly assigned to evaluate one of the booklets. Materials were also posted online to allow volunteers to respond from home. Images were rated on the following traits: attractive, extraverted, neurotic, agreeable, creative and healthy.

To determine if the two sides of the faces actually differed, the distance between the pupils was measured and the facial midpoint established. A line was drawn bisecting the face and the two halves were measured for width in centimeters.

Results

A *t*-test for matched pairs revealed that the right sides of the faces ($M = 3.908$ $SD = .342$) were significantly wider than the left sides ($M = 3.683$ $SD = .362$), $t(11) = 2.69$, $p = .021$. Analysis of variance revealed that attractiveness ratings varied by image type, $F(3,476) = 7.88$, $p < .0001$, as did the ratings for agreeableness, $F(3,476) = 5.27$, $p = .001$, and health, $F(3, 476) = 4.26$, $p = .006$. Planned comparisons revealed that chimeric left-left images were rated more attractive as well as more agreeable and healthier than the right/right images.

Table 1

Experiment 2: Means and Standard Deviations of Attractive by Face Type

Face Type	Mean	SD
Normal	3.000	.936
Mirror	3.082	.949
Left/left	3.393	1.000*
Right/right	2.803	.967

* $p < .0001$

Table 2

Experiment 2: Means and Standard Deviations of Agreeable by Face Type

Face Type	Mean	SD
Normal	3.108	.848
Mirror	3.041	.782
Left/left	3.391	.823*
Right/right	3.042	.726

* $p = .001$

Table 3

Experiment 2: Means and Standard Deviations for Healthy by Face Type

Face Type	Mean	SD
Normal	3.491	.756
Mirror	3.500	.745
Left/left	3.767	.827*
Right/right	3.433	.826

* $p = .006$

Discussion

Facial symmetry by itself did not yield more positive ratings. Only the left/left images received higher marks for attractiveness, agreeableness, and health. In contrast, the symmetrical right/right images received the lowest ratings. The evaluation of the left/left faces as more attractive agrees with Burt's (1997) study which found that the left side of the face influences judgments of attractiveness more than the right. Studies have also indicated that a thinner face is seen as more attractive (Cunningham, 1986) and chimeric images of two left sides of right-handed females used in the present study were thinner than those of two right sides.

Given that the left/left images were rated more attractive, it is not surprising that they were also rated more agreeable and healthier. Several studies have found positive correlations between attractiveness and such desirable attributes as sociability, happiness, and popularity (Eagly et al., 1991). Apparently the conclusion that "what is beautiful is good" (Dion & Berschied, 1972) incorporates agreeable and healthy as well.

Other research has identified a link between symmetry and ratings of healthiness. However, unlike the present study, Reis and Zaidel (2001) found that right/right chimeric faces of females were judged healthier. In that study participants chose whether a left/left or a right/right face was healthier. They interpreted their results in terms of evolutionary advantages of symmetry, but offered no explanation for the selection of right/right over left/left symmetry.

In the present study, the finding of preferences for left/left images may reflect the processing of the left visual field by the right hemisphere of the brain and that hemisphere's dominance in judging emotion (Levy et al., 1983; Stone et al., 1996). Additional evidence indicates that emotional judgments rely more on the left side of a face. Even chimpanzees trained to select a smiling face chose the left side of a chimeric face with half a smile more often than if the smile was on the right side (Morris & Hopkins, 1993).

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Author Note

The authors express appreciation to Jennifer Hornick, Wesley Holler and Jason Rosenblum for the complex job of programming the computers for this study, and the authors thank Laura J. Cortez for all her help.

This research was supported by stipends from a Department of Education Title V grant to St. Edward's University.

