Gender’s effect on the hemispheric laterality of Rembrandt’s portraits

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Abstract—In 64% of Rembrandt’s female portraits the poser’s left-cheek faces the viewer. However, this occurs in only 33% of his male portraits. This asymmetry is consistent with viewers rating Rembrandt’s left-cheeked male portraits as likely to be avoided, which may reflect that aggressive displays of dominance are governed by the contralateral right-hemisphere, while rating left-cheeked female faces as likely to be approached may indicate sexual attractiveness. Rembrandt’s exposed-cheek gender difference paints both sexual selection and dominance as being governed by the right cerebral hemisphere.

Keywords: Rembrandt; portraits; hemispheric laterality; gender differences.

INTRODUCTION

A comprehensive survey of 1474 portraits (of both genders) painted in Western Europe from the sixteenth to the twentieth century revealed that ~68% of the women were painted with their left-cheek exposed while only ~56% of the men exposed their left-cheek (Grusser et al., 1988; McManus, 1983; McManus and Humphrey, 1973; Schirillo, 2000). Interestingly, in 64% of Rembrandt’s female portraits the left-cheek faces the viewer while this is the case for only 33% of his male portraits (Bredius, 1969). This exaggerated portrait gender difference makes studying Rembrandt’s works especially enticing.

Researchers have postulated that humans’ more intense emotions are controlled by their right hemisphere (Davidson, 1995; Nestor and Safer, 1990) which fMRI evidence concurs is specialized for social and emotional functions (Tabert et al., 2001). This has resulted in having greater emotional expression displayed predominantly on the left-side of the face, which researchers have demonstrated repeatedly (Moscovitch and Olds, 1982; Sackeim et al., 1978). Yet Davidson’s

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(1984) seminal work has spearheaded the hypothesis that the left and right cerebral hemispheres govern approach and avoidance behavior, respectively (Coan et al., 2001; Davidson, 1984; Grusser et al., 1988; Reuter-Lorenz and Davison, 1981; Schirillo, 2000). If this is the case, in humans, the lower two-thirds of the right-side of the face (which includes the lower eyelid, nose, cheek, lips and neck because of innervations by the left-hemisphere), should display positive emotions while the comparable left-side of the face (innervated by the right-hemisphere) should display negative emotions (Rinn, 1984). It has now been shown that while both sides of the face show different emotions (i.e. left-side negative emotions and right-side positive emotions), the preponderance of emotional expression is on the left side of the face (Demaree et al., 2005; Nicholls et al., 2004). This makes it particularly interesting to better understand just why emotions are being differentially displayed.

We show here that these facial asymmetries produce approach/avoidance responses toward portraits painted by Rembrandt that depend on the gender of the person being portrayed. This is significant because in 64% of Rembrandt’s female portraits the left-cheek faces the viewer (Fig. 1c) while, conversely, the right-cheek faces the viewer in 67% of his male portraits (Fig. 1b). Our finding suggests that the social constraints exhibited during facial displays are asymmetrical by portrait gender, resulting in differential approach/avoidance behavior.

**METHODS**

Seventy-three experimentally naive undergraduates (23 males; age range 18–21 yrs) performed the experiment in exchange for introductory psychology course credit. Their age, gender and handedness did not contribute significantly to the results. All procedures were approved by the Institutional Review Board of Wake Forest University and were performed in accordance with the ethical standards established by the 1964 Declaration of Helsinki. All subjects were debriefed after performing the task.

Three-hundred and seventy-three of Rembrandt’s portraits (Bredius, 1969) were scanned in black and white, then cropped to include as little background/clothing information as possible, and scaled to a uniform size. Given that subjects viewing distance from the screen on which the portraits were displayed varied, the images ranged from $\sim 11^{\circ} \times 11^{\circ}$ to $\sim 17^{\circ} \times 17^{\circ}$ of visual angle. Each image appeared for five seconds and responses were recorded manually during a three-second blank gray screen inter-trial interval. All the pictures were viewed as Rembrandt painted them (i.e. not mirror-reversed). The subjects’ task was to rate whether they would rather approach or avoid each individual portrait on a 5-point scale, with 1 indicating a rating of ‘strongly approach’, 2 ‘mildy approach’, 3 ‘neutral’, 4 ‘mildy avoid’ and 5 ‘strongly avoid’. All subjects judged all portraits. The angle at which each portrait faced the viewer was measured with $-90^{\circ}$ and $+90^{\circ}$ equaling full-left and full right profile, respectively, while $0^{\circ}$ represents full-frontal view. The orientation estimates were made by the two judges (the experimenter being one) who rotated a sculpted