Facial Sexual Dimorphism and Judgments of Personality: A Literature Review

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Facial sexual dimorphism lends itself to myriad facial traits that result from an individual's unique exposure to the sex hormones testosterone and estrogen. The following literature review will discuss psychological research from the late 20th century onwards pertaining to facial sexual dimorphism - facial masculinity and femininity - as it relates to the judgment of personality traits, specifically the Big Five personality traits proposed by Goldberg (1993): openness to experience, conscientiousness, extraversion, agreeableness and neuroticism. Research from the past three decades pertaining to facial judgments of personality has investigated correlations of specific personality traits with facial attractiveness as well as symmetry.

Studies on human facial sexual dimorphism have yielded intriguing insights into perceptions of other characteristics, such as attractiveness or trustworthiness, based on facial masculinity or femininity. Specifically, by manipulating the degree of sexually dimorphic facial traits in computerized faces, scientists have been able to study what judgmental differences arise as a result of physical alterations. What is significant about these findings is their evolutionary implications, in particular the facial cues that trigger innate judgments in reaction to a masculine or feminine face. Multiple studies have confirmed the correlations between sexually dimorphic faces and ratings of attractiveness (Smith et al. 2008; Lee et al. 1998; Welling et al. 2008), and many psychologists theorize that such judgments are evolutionarily based. Sexual selection in humans is largely based upon facial cues and their reflection of an individual's reproductive quality. In a recent study, Little et al. (2008) found that symmetry and sexual dimorphism in faces are both judged as more attractive to the opposite sex, leading the researchers to conclude that both qualities are reflective of biological quality, and that such judgments are likely to be the result of sexual selective pressures and mate choice preferences.

However, studies on facial judgments have rarely diverted from focuses on attractiveness and physical characteristics that signal biological quality. It is quite clear, nonetheless, that in the evolutionary past of humans, judgments of faces would have been influenced beyond solely attraction and mate selection. One can theorize that faces would have revealed other possibly important signals related directly to survival of both oneself as well as one's offspring, such as willingness to cooperate with others or tendencies to be violent (Carré et al. 2009). Given that facial sexual dimorphism is largely caused by exposure to the same hormones – that is, testosterone and estrogen – that also instigate myriad behavioral and emotional effects, it is logical to theorize that facial traits would possibly alter perceptions of behavioral and personal tendencies as well.

Research pertaining to facial ratings and attribution of personality traits is a field of study in psychology with a dynamic history, one used by the Nazis to classify Jewish faces as well as in research studies in the later 20th century attempting to classify animals using facial traits. Nonetheless, modern psychological study in this field remains relatively new, with the first major study conducted by Stackelford and Larsen in 1997. The researchers found that individuals with asymmetric faces were rated as more "neurotic," with higher ratings of impulsiveness in both sexes, and emotional instability in male faces (Stackelford & Larsen, 1997). Their findings relate to the judgments of attractiveness in relation to facial symmetry, particularly that those individuals with asymmetric features are more prone to more stress-related events in their lives, and thus are judged as less attractive due to their reproductive disadvantageousness. While these results shed light onto the relation between facial symmetry and one of Goldberg's five dimensions of personality - neuroticism - there remained a lack of research into external judgments of the other four personality traits in relation to facial attractiveness or sexual dimorphism. Noor and Evans (2003) elaborated on and confirmed Stackelford and Larsen's initial findings by studying the correlations between facial symmetry and all five of Goldberg's personality traits. Specifically, they found that facial asymmetry had significant

effects on judgments of neuroticism, agreeableness, and conscientiousness, but not on openness to experience and extroversion; with higher asymmetry, judges rated faces as more neurotic, less agreeable, and less conscientious. In behaviorally descriptive terms, asymmetrical faces were found to be rated as more 'worrying' and 'anxious,' less 'helpful' and 'sympathetic,' and more 'negligent' and 'impulsive,' in the respective order of the three personality traits previously mentioned (Noor & Evans 2003). Those personality traits correlated significantly to particular facial characteristics are arguably more innate and less socially malleable than are the other two traits of openness and extraversion. As such, one would expect those personality traits that have greater genetic influence than social ones, or those that are less prone to change through means of nurture, would be under greater selective pressure, and would thus manifest in facial characteristics with greater frequency than those that are more easily changed with social upbringing.

Research conducted over the past three years have yielded additional findings regarding correlations between facial symmetry and attractiveness to judgments of certain personality traits. However, as previously reiterated, few if any studies have been conducted on judgments of actual personality traits in relation to facial sexual dimorphism. Fink et al., (2006) for instance, acknowledge the prevalence of studies regarding attractiveness and health perceptions of faces, but that more research is still required to better comprehend personality attributions to facial characteristics, particularly within an evolutionary framework. With this idea in mind, Fink et al. conducted research on the facial symmetry and its relation to perceptions of attractiveness, health, and personality traits. The significant contribution of their study was the information related to facial symmetry and personality characteristics when attractiveness was controlled. In particular, the researchers found that extraversion and openness to experience were most strongly associated with facial symmetry. From this data, Fink et al. suggest that outside judgments of an individual may reflect an individual's actual personality, and facial symmetry is an externally indicative correlate to personality (Fink et al., 2006). The authors theorize that facial symmetry, similar to facial sexual dimorphism in that both are based heavily on hormonal and other biological processes, may be reflective of personality traits based on the influence of the sex hormones testosterone and estrogen. Specifically, they argue for the possibility of the effect

of these hormones on both the development processes of the face as well as on sex-dependent personality traits (Fink et al. 2006). This compelling theory predicts that sexual dimorphic facial traits may be evolutionarily indicative of certain personality traits influenced by the same sex hormones responsible for facial sexual dimorphism.

Though only focused on narcissism as Stackelford and Larsen had done before, Holtzman and Strube (2009) propose an evolutionary theory behind the results they obtained on facial attractiveness and narcissism, elaborating on facial judgments in evolutionary terms but still lacking full-dimensional analysis covering all five personality traits. Specifically, the researchers argue that narcissists have greater propensities to pursue short-term mating that are casual and uncommitted, and are further capable of handling the respective consequences that such relationships present (Holtzman & Strube, 2009). Given that short-term mating relationships are more contingent upon attractiveness than are long-term relationships, it is logical to conclude that narcissists, whose relationships rely heavily on attractiveness, would be reproductively successful and thus pass down their facial and personality traits to successive generations. This theory presents one feasible evolutionary explanation behind the development of narcissism and its relation to facial attractiveness. Because symmetry is one element that constitutes attractiveness, it is a narrower window through which to study the correlation to judged personality traits. However, facial attractiveness at a general level constitutes sexual dimorphism, meaning that a sexually dimorphic face, whether masculine or feminine, can arguably be perceived as being attractive as well, but by no means symmetrical. In this sense, the findings by Holtzman and Strube (2009) are relevant and thus important to the topic.

Research conducted by Penton-Voak et al. (2006) is the sole study conducted to date that has found differing personality traits attributed to male and female faces. In their theoretical framework, the authors hypothesize that evolutionary selective forces may be at play in external judgments of personality between the sexes, but do not explicitly discuss facial sexual dimorphism and its relation to judged personality traits. Specifically, the researchers found that judgments on personality on composite faces were most accurate to self-reports for agreeableness and extraversion in both sexes, and emotional stability in only males (Penton-Voak et al, 2006). From these

findings, they introduce several theories to explain the difference in accurate judgments between the male and female faces. Firstly, they attribute stereotypical attributions to particular personality judgments, for instance, that more masculine faces are judged as more dominant and thus, less prosocial (Penton-Voak et al., 2006). Another more evolutionary explanation states that male faces would be more accurately judged for personality as a result of female sexual selective behaviors, considering that mate selection has more repercussions and is thus more significant for females than for males. Specifically, Penton-Voak et al. (2006) argue that when women judge attractiveness in male faces, they have the ability to detect biological quality through facial masculinity – and through that, dominance and narcissism - or prosociality through facial femininity - suggesting warmth and agreeableness - through evolutionary adaptation.

A final relevant study is that conducted by Watson in 1989, in which he found high convergent validity between self and peer assessments of personality, most significantly for extraversion and consciousness. This study discusses two significant topics: it suggests that external judgments of personality by strangers are partially accurate, and that the level of accuracy of the ratings differs depending on certain personality traits. As to why certain traits are more correctly judged than others remains a question left open to evolutionary analysis.

The presented literature review of research from the past two decades discusses studies conducted on facial judgments of attractiveness or symmetry and their correlation with judgments of personality traits. Much research has been conducted on external judgments of personality as they relate to facial asymmetry and neuroticism (Stackelford & Larsen, 1997), facial symmetry and personality (Fink et al., 2006), facial attractiveness and narcissism (Holtzman and Strube, 2009) and judgment accuracy differences between the sexes (Penton-Voak et al, 2006). This body of literature, however, lacks any research conducted on facial sexual dimorphism - that is, facial masculinity and femininity - and its correlation to judgments of personality traits. The implications of such studies would yield many intriguing theories with evolutionary bases on facial judgments, specifically sex differences in faces that possibly correlate with particular personality traits.

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