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Women's preferences for masculinity in male faces are predicted by pathogen disgust, but not by moral or sexual disgust

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Abstract

Because women's preferences for male masculinity reflect tradeoffs between the benefits of greater genetic health and the costs of lower paternal investment, variables that affect the importance of these costs and benefits also affect masculinity preferences. Concern about disease and pathogens may be one such variable. Here we show that disgust sensitivity in the pathogen domain is positively correlated with facial masculinity preferences, but disgust sensitivity in the moral and sexual domains is not. Our findings present novel evidence that systematic variation in women's preferences for masculine men reflects factors that influence how women resolve the tradeoff between the benefits and costs associated with choosing a masculine partner.

Keywords: Masculinity; Disgust; Pathogens; Individual differences

Several lines of evidence suggest that masculinity signals genetic (i.e., heritable) good health. For example, facial masculinity in human males is associated with a lower incidence of disease (Rhodes, Chan, Zebrowitz & Simmons, 2003; Thornhill & Gangestad, 2006). Male facial masculinity is also positively correlated with symmetry, a potential signal of developmental stability (Gangestad & Thornhill, 2003; Little, Jones, Waitt et al., 2008). Additionally, women's preferences for masculinity and symmetry are positively correlated, suggesting both traits signal a common underlying quality (Little, Jones, DeBruine & Feinberg, 2008). Although male masculinity is associated with health benefits, it is also associated with negative personality traits and behaviors. For example, high-testosterone men are less likely to marry, more likely to divorce and have more marital problems than lower-testosterone men (Booth & Dabbs, 1993). Men with higher testosterone are also less likely to feel a need to respond to infant cries than men with lower testosterone (Fleming, Corter, Stallings & Steiner, 2002). Masculine male faces are also ascribed antisocial traits, such as low warmth, low emotionality, dishonesty, low cooperativeness and poor quality as a parent (Boothroyd, Jones, Burt & Perrett, 2007; Perrett et al., 1998). Masculine men are also perceived to have more interest in short-term than in long-term relationships (Kruger, 2006), and masculine men have more short-term, but not long-term, partners than feminine men do (Rhodes, Simmons & Peters, 2005).

Attraction to masculinity is a function of the tradeoffs between the benefits of greater genetic health and the costs of lower investment in relationships and children (Fink & Penton-Voak, 2002; Gangestad & Simpson, 2000; Little, Jones, Penton-Voak, Burt & Perrett, 2002). Factors that affect the relative importance of these costs and benefits affect this tradeoff. For example, the benefits of genetic health for offspring can only be attained when women are able to conceive and preferences for masculine traits are accordingly greater when conception risk is high (for

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reviews, see Fink & Penton-Voak, 2002; Gangestad & Simpson, 2000; Gangestad & Thornhill, 2008; Jones et al., 2008). Additionally, the paternal investment costs associated with partnering with a masculine man are less important in short-term relationships than in long-term relationships. Accordingly, women prefer more masculine men for short-term than for long-term relationships (Burt et al., 2007; Little et al., 2002; Little, Cohen, Jones & Belsky, 2007). Because a partner's heritable health is of greater value when pathogens are a greater concern, concern about pathogens is likely to also be a factor that contributes to the resolution of this tradeoff.

Cross-cultural differences in mate preferences and mating systems vary consistently with differences in pathogen prevalence (Gangestad & Buss, 1993; Low, 1990; Penton-Voak, Jacobson & Trivers, 2004). When people from 29 different cultures were asked to rank a series of attributes based on how important they would be in a mate, people in areas with a high prevalence of pathogens ranked physical attractiveness higher than people in areas with a relatively low prevalence of pathogens did (Gangestad & Buss, 1993). Areas with higher pathogen prevalence also have a higher proportion of polygynous marriages, possibly reflecting that women are trading paternal investment for genetic quality when disease is a greater concern (Low, 1990). Also consistent with these findings, rural Jamaican women prefer masculinity more than British women do, although this may alternatively or additionally be explained by differences in the mating and parenting systems (Penton-Voak et al., 2004). While these studies have emphasized how cross-cultural differences in pathogen levels may affect mate preferences, individual differences in concern about disease and pathogens may also affect mate preferences. Specifically, differences among women in concerns about disease and pathogens may be positively related to preferences for cues of genetic health in potential mates, such as male facial masculinity.

Concern about pathogens can be assessed by measuring disgust sensitivity. Disgust towards potential sources of pathogens has been shown to be a separate domain of the emotion disgust that is relatively independent of the other domains of moral and sexual disgust (Tybur, Lieberman & Griskevicius, 2009). Therefore, we predict that women's preferences for male facial masculinity will be positively associated with their disgust sensitivity in the pathogen domain, but will not necessarily be consistently positively associated with disgust sensitivity in the moral and sexual domains. Such a pattern of results would reveal domain specificity in the relationship between disgust and masculinity preferences and present novel converging evidence that variation in concerns about pathogens and disease influences facultative human mate preferences. We investigated this prediction using two different methods for assessing masculinity preferences: preference for computer graphic-manipulated masculinity (Study 1) and preference for rated masculinity in unmanipulated faces (Study 2).

1. Study 1 — Manipulated masculinity

Computer-graphic methods can be used to objectively and systematically manipulate the masculinity of two-dimensional (2D) face shape (Rowland & Perrett, 1995). This method is widely used in studies of masculinity preferences (e.g., DeBruine et al., 2006; Jones et al., 2005; Penton-Voak et al., 1999; Welling et al., 2007) and yields preferences that are comparable to other methods of manipulating masculinity (DeBruine et al., 2006). Faces manipulated using this method differ reliably in perceived masculinity and dominance (DeBruine et al., 2006; Welling et al., 2007). Additionally, this method produces preferences that correlate with actual and ideal partner masculinity (DeBruine et al., 2006).

A major advantage of the manipulated masculinity method is that it allows masculinity preferences to be assessed independently of other facial characteristics that are correlated with masculinity. For example, masculine male faces are also more symmetric than feminine male faces (Gangestad & Thornhill, 2003; Little, Jones, DeBruine et al., 2008). Masculinity may also correlate with apparent health in unmanipulated faces, but manipulating masculinity does not affect apparent health (Boothroyd et al., 2005).

1.1. Methods

1.1.1. Participants

Participants in Study 1 were 345 women between the ages of 18 and 40 years (mean=25.3, S.D.=6.63). The study was conducted online and participants were recruited by following links from various search engines and listings of online psychology experiments. Previous studies have demonstrated that online and laboratory studies of variation in face preferences produce equivalent patterns of results (e.g., Jones et al., 2005, 2007).

1.1.2. Stimuli

Stimuli were face images of 20 white men (mean=19.5 years, S.D.=2.3) that had been masculinized and feminized using computer-graphic transformation (Rowland & Perrett, 1995) to exaggerate male-typical or female-typical 2D facial configuration. First, male and female prototypes were manufactured by averaging the shapes of 60 white male or 60 white female faces. These prototypes were used to transform the 20 individual face images by adding or subtracting 50% of the linear differences in 2D shape between the male and female prototypes. This process creates masculinized and feminized versions (Fig. 1) of the images that differ in masculinity (i.e., sexual dimorphism) of 2D shape and that are matched in other regards (e.g., skin color; Tiddeman, Burt & Perrett, 2001).

To confirm that this manipulation influenced perceptions of masculinity in the predicted manner, 14 women between the ages of 16 and 40 (mean=23.1, S.D.=7.61) were asked to indicate the more masculine face for each of the 20 pairs of