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Men's attractiveness predicts their preference for female facial femininity when judging for short-term, but not long-term, partners

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ABSTRACT

It is well established that women's preferences for masculinity are contingent on their own market-value and the duration of the sought relationship, but few studies have investigated similar effects in men. Here, we tested whether men's attractiveness predicts their preferences for feminine face shape in women when judging for long- and short-term relationship partners. We found that attractive men expressed a stronger preference for facial femininity compared to less attractive men. The relationship was evident when men judged women for a short-term, but not for a long-term, relationship. These findings suggest that market-value may influence men's preferences for feminine characteristics in women's faces and indicate that men's preferences may be subject to facultative variation to a greater degree than was previously thought.

1. Introduction

Facial femininity/masculinity is an attractiveness cue that has received extensive investigation (DeBruine et al., 2006; Roberts & Little, 2008). Despite strong agreement as to what constitutes an attractive face (Langlois et al., 2000), women's preferences for masculinity are subject to individual differences in properties such as their relative value on the mating market. Women who rate themselves as attractive prefer more masculine faces (Little, Burt, Penton-Voak, & Perrett, 2001; Little & Mannion, 2006), as do women who are independently assessed as attractive, or have a low (i.e. attractive) waist-to-hip ratio (Penton-Voak et al., 2003; Smith et al., 2009). This effect generalizes to other modalities: Women with a lower waist-to-hip ratio express stronger preferences for healthy-looking male faces (Jones et al., 2005), and women who self-rate as attractive and have a higher, more feminine voice pitch prefer a lower male pitch (Vukovic et al., 2008, 2010). Women's preferences for masculinity also vary according to the context of the sought relationship, with masculinity preferred in short-term rather than long-term partners (Little, Jones, Penton-Voak, Burt, & Perrett, 2002). These individual differences likely depend on the extent to which a woman is personally affected by the positive and negative traits associated with masculinity (Little et al., 2001). Although men with a masculine facial appearance tend to have better long-term health (Rhodes, Chan, Zebrowitz, & Simmons, 2003; Thornhill & Gangestad, 2006), they are perceived to be unsuitable parents, dishonest, and uncooperative (Perrett et al., 1998). They also have higher levels of testosterone (Penton-Voak & Chen, 2004), which are associated with a preference for short-term, uncommitted relationships (Alvergne, Faurie, & Raymond, 2009; Gray, Campbell, Marlowe, Lipson, & Ellison, 2004). These findings suggest that women's market-value- and context-dependent preferences could have been shaped by selection if greater value is placed on masculinity when prioritizing genetic quality (for short-term relationships), and on femininity when material investment is of greater concern (for long-term relationships, or if the rater is of relatively low attractiveness).

These effects are well established in women, but few studies have investigated similar effects in men. Female facial femininity evokes positive attributions, such as warmth, honesty, cooperativeness, youthfulness, and health (Law Smith et al., 2006; Perrett et al., 1998), and is negatively correlated with reported respiratory-infection frequency and duration (Thornhill & Gangestad, 2006). It is therefore unsurprising that men consistently express a preference for femininity (Cunningham, 1986; Law Smith et al., 2006; Little, Cohen, Jones, & Belsky, 2007; Perrett et al., 1998; Rhodes, Hickford, & Jeffery, 2000). Furthermore, because short-term mating is associated for men with potentially greater reproductive rewards and fewer costs than it is for women, men may be more willing to compromise across contexts, and to attend less closely to their own market-value (Regan, 1998). However, the efficient allocation and expenditure of mating effort likely depends on a man's

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market-value and the context of the relationship sought, as it does in women.

To our knowledge, no studies have directly examined whether men's market-value affects their preferences for female facial femininity. Welling et al. (2008) found that when men's salivary testosterone concentration is higher, their preference for female facial femininity increases. Because the authors did not include an analysis that controlled for attractiveness, it is unclear whether this effect is mediated by changes in self-perceived market-value. Similarly, men who score highly on a sensation-seeking scale express a stronger preference for femininity (Jones et al., 2007). Sensation-seeking behavior may signal male market-value, but likely has an independent effect on preferences because the relationship holds when self-rated attractiveness is kept constant (Jones et al., 2007). Facially feminine women tend toward higher estrogen levels (Law Smith et al., 2006), so a preference for femininity may have evolved because it led men to partner with women with good reproductive health (Baird et al., 1999; Thornhill & Gangestad, 1999). The heightened masculinity preferences of attractive women likely dissuade men who are less attractive or masculine from approaching these women, so as to avoid an unproductive expenditure of mating effort (Little et al., 2001; Penton-Voak et al., 2003). Together, this evidence suggests that more attractive men will express a stronger preference for facial femininity.

Men's preferences may also be context-dependent. Recent research has shown that a feminine voice pitch is especially attractive to men judging for short-term partners (Puts, Barndt, Welling, Dawood, & Burriss, 2011), and the same may be true for face preferences. Men are less particular when choosing partners for short-term as opposed to long-term relationships (Buss & Schmitt, 1993), but their standards for physical attractiveness drop less than their standards for other, non-physical qualities (Kenrick, Groth, Trost, & Sadalla, 1993). Men emphasize the importance of physical cues when judging for short-term relationships, whereas for long-term relationships they place greater weight on good parenting skills, honesty, intelligence, fidelity, and likeability (Buss & Schmitt, 1993; Greitemeyer, 2007; Li, 2007; Regan, 1998; Regan, Levin, Sprecher, Christopher, & Cate, 2000). Attractiveness of the body is relatively more important when men judge for short-term relationships (Confer, Perilloux, & Buss, 2010; Currie & Little, 2009), probably because body attractiveness is a better indicator of current fertility than is facial attractiveness. Moreover, female facial attractiveness (and presumably therefore femininity) is inversely related to sexual restrictedness (Boothroyd, Jones, Burt, DeBruine, & Perrett, 2008), meaning that attractive women are less averse to the idea of uncommitted relationships. Higher levels of estradiol are also associated with an opportunistic mating strategy and reduced commitment to primary partners (Durante & Li, 2009). Men value a high sex drive in both short- and long-term partners (Regan et al., 2000), but one of the problems they face in the short-term is identifying sexually accessible women (Buss & Schmitt, 1993). A heightened preference for facial femininity in short-term partners could help solve this problem. We also note that, although facial femininity is associated with perceptions of a number of positive personality traits, women whose facial features are prototypical, as opposed to highly masculine or feminine, may be seen as better parents (Perrett et al., 1998). Because parenting skills are valued more in a long-term partner, this may reduce feminine women's perceived suitability for long-term relationships, while leaving short-term attractiveness relatively unaffected.

We tested whether men's attractiveness predicts their preferences for feminine female face shape when judging attractiveness in both long- and short-term relationship contexts. We predicted that men would express a weaker preference for facial masculinity (i.e. a stronger preference for facial femininity) when judging for short-term relationships. We also predicted that comparatively attractive men would show a weaker preference for facial masculinity, and that this relationship would be stronger when men judged for short- rather than long-term relationships. As with previous studies that have examined market-value-dependent preferences in humans, we chose to use independent as well as subjective measures of attractiveness (Penton-Voak et al., 2003; Smith et al., 2009; Vukovic et al., 2010). Also following previous studies (Jones et al. 2007, 2005; Little et al., 2001), we presented our participants with both same- and other-sex faces. If market-value or context predict men's preferences for female but not male faces, this will support the interpretation that these effects are evidence of adaptations that guide mating behavior, as opposed to more general purpose mechanisms.

2. Material and methods

2.1. Participants

One hundred and seventeen men, recruited through the Psychology Department of a University in northeastern USA, participated in this IRB approved study. Because we recruited participants for a wider study of heterosexual couples, all had other-sex partners. Three men withdrew from the study, and a further three did not complete all tasks, leaving a sample of 111 (mean age = 20.73 years, SD = 3.37, range = 18–46 years). Of those, 109 identified as White, and one each as Filipino and Hispanic. Compensation was $14USD or equivalent course credit.

We recruited nine women and nine men from a university in northwest UK. For clarity we label these participants "judges". The judges rated the photographs of participants for attractiveness (further details below), and were not rewarded.

2.2. Stimuli

We randomly selected facial photographs of 10 White women (mean age = 22.2, SD = 1.48) and 10 White men (mean age = 22.6, SD = 2.27) from a larger pool. We rotated and scaled these images so that pupils lay on a horizontal line and interpupilary distance was constant. We transformed these base images by ±50% of the differences between prototype male and female faces using standard methods (e.g. DeBruine et al., 2006; Little et al., 2001; Welling et al., 2008). For convenience, +50% transforms will hereafter be labeled *masculinized*, and −50% transforms, *feminized* (see Fig. 1). This type of manipulation influences perceptions of masculinity in the predicted direction (DeBruine et al., 2006; Welling et al., 2007).

Fig. 1. Example of a feminized (left) and masculinized (right) female face.

2.3. Procedure

Participants attended two half-hour laboratory sessions scheduled seven days apart. In session one, we took the participants' facial photographs (one did not consent). Participants completed a questionnaire and three facial masculinity preference tasks. The primary reason for participants attending a second session was to complete additional tasks that are not the subject of this paper. However, we took the opportunity during session two to have participants repeat the questionnaire. Participants undertook all tasks using a computer at a private workstation.

We photographed participants in a windowless room with consistent overhead lighting. We used a camera-mounted flash, set the focal distance at approximately two meters, and standardized white-balance. Participants removed spectacles and facial jewelry, maintained a neutral expression with mouth closed, and ensured that their heads were not tilted on any axis. Where necessary, participants used hair bands to keep hair away from their forehead and ears. Photographs were immediately inspected on a computer monitor. Substandard images were deleted and retaken. We retook a number of photographs during the second session to maintain a high standard of image quality.

The questionnaire included questions on date of birth and ethnicity. Age data were collected for use as an additional predictor, as previous research has shown that age is related to facial masculinity preferences (Little et al., 2001). In analyses we used participants' age at the first session, calculated to a precision of 100th of a year. Participants self-rated attractiveness using a ten-point Likert scale (anchors: 1 = *Not at all attractive*, 10 = *Very attractive*). By collecting self-ratings of attractiveness in sessions one and two, we were able to calculate average self-rated attractiveness, which may more closely represent participants' perceptions over time. Self-ratings in session one correlated strongly with those in session two, $r = .83$, $p < .005$.

In the three facial masculinity preference tasks, participants judged female faces on their attractiveness for long- and short-term relationships (participants saw the same set of female faces twice), and male faces on their attractiveness to an average heterosexual woman of about the participant's age. The order in which participants completed the three tasks was randomized for each participant. Before starting the tasks, participants read relationship definitions (see Little et al., 2007). During each task participants saw ten pairs of faces, each consisting of a masculinized and feminized version of the same face. Pairs were presented in a different random order for each participant, as was the side of the screen on which each image appeared. Participants expressed the extent to which they preferred an image by mouse-clicking on buttons marked *Amount left/right image is more attractive: Guess, Slightly more, Somewhat more,* and *Much more* (same four buttons beneath each image).

We asked participants to consent to their photograph being rated by others. Of the 117, 74 men consented. One man exhibited injury-related facial swelling that may have affected ratings of his appearance and so his image was omitted. Because hairstyle and other non-face cues can influence judgments of facial appearance (DeBruine, Jones, Smith, & Little, 2010; Roberts et al., 2004), we masked the photographs to obscure hair, neck, and clothes (see Fig. 2). The judges rated the photographs of the participants for attractiveness (seven point scale: 1 = *Very unattractive* and 7 = *Very attractive*) in a random order using a laptop computer. Ratings made by women are likely to be of greatest relevance to heterosexual men, but we chose to use male and female judges because same-sex perceptions are also likely to be socially important. Reliability among raters was not high: The intraclass correlation for ratings made by all judges was $r = .34$. For male judges the coefficient was $r = .38$, and for female, $r = .29$. We followed the procedure common among researchers in this area (e.g. DeBruine et al., 2006; Penton-Voak et al., 2001), averaging the ratings so that each participant received a mean other-rated attractiveness score.

Fig. 2. A masked photograph. How the photographs of participants appeared when rated for attractiveness by the judges.

2.4. Initial processing of data

We coded each participant's responses on an eight-point scale (1 = strong preference for femininity, 8 = strong preference for masculinity) and calculated mean scores across all ten trials for each of the three tasks. The mean self-rated attractiveness score was 6.80 out of 10 (SD = 1.19) and the mean other-rated attractiveness score was 3.20 out of 7 (SD = .87).

3. Results

3.1. Overall preferences and effect of relationship context

One-sample *t*-tests against chance (4.5) revealed overall preferences for femininity over masculinity in the long-term, $t(110) = -14.19$, $p < .001$, $r = .80$, and short-term contexts, $t(110) = -16.03$, $p < .001$, $r = .84$, in line with previous findings.

Men did not express a stronger preference for femininity as a function of relationship context: paired *t*-test, $t(110) = 1.73$, $p = .086$, $r = .16$.

3.2. Self-rated attractiveness

A multiple regression analysis with short-term femininity preference as the outcome variable and participants' self-rated attractiveness and age as predictors revealed a significant relationship, $F(2, 109) = 3.97$, $p = .022$. Self-rated attractiveness was identified as a significant predictor, $\beta = .22$, $t = 2.33$, $p = .022$, although age was not, $\beta = -.12$, $t = -1.31$, $p = .19$. For long-term femininity preferences, the model was not significant, $F(2, 109) = 1.02$, $p = .36$. Neither self-rated attractiveness, $\beta = -.061$, $t = -.63$, $p = .53$, nor age, $\beta = .12$, $t = 1.21$, $p = .23$, had significant univariate effects. For judgments of the attractiveness of other men, the model was again not significant, $F(2, 109) = 2.35$, $p = .10$. Self-rated attractiveness was not a significant predictor, $\beta = -.71$, $t = -.74$, $p = .46$, but age was, $\beta = -.20$, $t = -2.11$, $p = .037$. Older participants tended to express weaker preferences for masculinity when judging the attractiveness of same-sex faces.

3.3. Other-rated attractiveness

A regression with short-term femininity preference as the outcome and participants' other-rated attractiveness and age as predictors revealed a significant relationship, $F(2, 67) = 4.10$, $p = .021$. Other-rated attractiveness was a significant predictor, $\beta = .26$, $t = 2.24$, $p = .029$, although age was not, $\beta = -.21$, $t = -1.79$, $p = .077$. For long-term femininity preferences, the model was not significant, $F(2, 67) = .67$, $p = .51$. Neither other-rated attractiveness, $\beta = -.083$, $t = -.68$, $p = .50$, nor age, $\beta = .12$, $t = .94$, $p = .35$, had significant effects. For judgments of the attractiveness of other men, the model was again not significant, $F(2, 69) = .14$, $p = .87$. Neither other-rated attractiveness, $\beta = .064$, $t = .52$, $p = .60$, nor age, $\beta = .002$, $t = .020$, $p = .98$, had significant effects.

3.4. Comparison of attractiveness measures

The two measures of attractiveness produced comparable results. It is possible, however, that one measure is a better predictor of preferences for female facial femininity. To explore this possibility, we entered both measures, as well as age, as predictors in a regression with short-term preferences as the outcome. Because self- and other-rated attractiveness were significantly correlated, $r = .60$, $p < .001$, we performed multicollinearity diagnostics. All VIF <1.60, indicating that the influence of multicollinearity was low. The model was significant, $F(3, 67) = 2.83$, $p = .045$. Other-rated attractiveness had a significant univariate effect, $\beta = .32$, $t = 2.12$, $p = .038$, but self-rated attractiveness did not, $\beta = -.093$, $t = -.61$, $p = .55$. The effect of age fell short of significance, $\beta = -.23$, $t = -1.88$, $p = .064$.

4. Discussion

This study demonstrates that men's attractiveness predicts their preference for female facial femininity. First, we replicated previous findings that femininity is generally attractive to men (Cunningham, 1986; Law Smith et al., 2006; Little et al., 2007; Perrett et al., 1998; Rhodes et al., 2000). We did not find an effect of relationship-context on men's preferences for femininity. Although context is likely to be of greater importance to women, we did predict that men would express a stronger preference for femininity when judging for a short-term partner; therefore our prediction was unsupported.

Next, we showed that men's attractiveness is inversely related to their preference for facial masculinity: Comparatively attractive men preferred feminine women. This was true whether attractiveness was estimated from the mean of 18 independent ratings or from ratings made by the participants themselves. A model that included both measures demonstrated that the influence of other-rated attractiveness was more important. Because other-rated attractiveness is likely to be a better measure of facial attractiveness (self-ratings may have been based on non-face information), this regression may indicate that facial attractiveness is the critical predictor of individual differences in men's preferences.

Our findings complement those of other researchers who showed that women's attractiveness is related to their preferences for valued male traits (Jones et al., 2005; Little et al., 2001; Little & Mannion, 2006; Penton-Voak et al., 2003; Smith et al., 2009; Vukovic et al., 2008; 2010). Attractive men are better placed to compete for relationships with attractive women, so attractiveness-dependent preferences likely focus men's attention toward women who are both attractive and potentially obtainable. There was no relationship between men's attractiveness and their judgments of male faces, indicating that the market-value effect does not generalize to perceptions of those who are not potential mates.

Men emphasize physical appearance over non-physical cues when judging women's attractiveness for short- rather than long-term relationships (Buss & Schmitt, 1993; Kenrick et al., 1993). Also, women express stronger preferences for masculinity when judging for short-term relationships (Little et al., 2002). Therefore, we expected that market-value-dependent preferences for physical attractiveness would be stronger when men judged for short-term relationships. We found this to be true: Men who were more attractive expressed stronger preferences for feminine-faced women, but only when judging for short-term relationships. If female facial femininity indicates mate quality (Law Smith et al., 2006; Perrett et al., 1998; Thornhill & Gangestad, 2006), men may prefer to partner with feminine women in the long- rather than the short-term, because the greater investment required for the maintenance of long-term relationships promotes choosiness. However, because facial femininity is positively related to estrogen levels (Law Smith et al., 2006), it may also connote traits especially attractive in the short-term, including fertility (Baird et al., 1999) and a greater interest in uncommitted relationships (Boothroyd et al., 2008). Furthermore, a feminine face may imply traits that limit female long-term attractiveness, such as lower perceived parental suitability (Perrett et al., 1998). Because physical appearance is more important to women when judging potential short-term partners, men's market-value dependent preferences for femininity in the short-term could be driven by women's preferences: Attractive men are more likely to be selected as the partners of attractive women seeking short-term relationships and so prefer to pursue these women and relationships.

In summary, we found that men's market-value predicts their preferences for female facial femininity. This is true when men judge women for short-term but not for long-term relationships. Our findings suggest that men's preferences are subject to facultative variation to a greater degree than was previously thought.

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