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Short Communication

Extraversion predicts individual differences in women's face preferences

Lisa L.M. Welling^{a,*}, Lisa M. DeBruine^a, Anthony C. Little^b, Benedict C. Jones^a

^a School of Psychology, University of Aberdeen, Scotland, UK

^b School of Psychology, University of Stirling, Scotland, UK

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ABSTRACT

Extraversion is positively associated with various indices of women's mate quality (e.g., facial symmetry and attractiveness). Since such indices are thought to predict variation in women's preferences for masculine men, we investigated the relationships between each of the 'Big 5' personality factors and women's preferences for facial masculinity. Extraversion, but not the other four personality factors, was positively correlated with women's preferences for masculinity in men's, but not women's, faces. Additionally, extraversion mediated the positive relationship between women's self-rated attractiveness and their preferences for masculinity in men's faces, suggesting that extraversion may play a role in condition-dependent mate preferences. Unexpectedly, openness to experience was associated with women's preferences for femininity in faces of both sexes and this association was independent of that between extraversion and women's preferences for masculine men. This is the first study that we know of to implicate personality traits in individual differences in women's preferences for masculine men.

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1. Introduction

Masculine facial characteristics are positively associated with indices of men's health (e.g., Thornhill & Gangestad, 2006), but are also associated with negative traits that are not desirable in a mate. For example, men with masculine facial characteristics are more interested in pursuing short-term relationships and are perceived by women as less likely to be good parents than are men with feminine facial characteristics (Boothroyd, Jones, DeBruine, & Perrett, 2008; Perrett et al., 1998). Many researchers have suggested that individual differences in how women resolve this tradeoff between the costs and benefits associated with choosing a masculine partner will give rise to variation in women's masculinity preferences (e.g., Fink & Penton-Voak, 2002).

Women's own mate quality is one likely source of variation in masculinity preferences (Fink & Penton-Voak, 2002; Little, Burt, Penton-Voak, & Perrett, 2001). Indeed, women's self-rated attractiveness is positively associated with the strength of their preferences for masculinity in men's faces (Little et al., 2001) and voices (Vukovic et al., 2008). Furthermore, women with attractive faces and body shapes also demonstrate stronger preferences for facial masculinity than relatively unattractive women do (Penton-Voak et al., 2003). Such condition-dependent preferences are potentially adaptive if attractive women are better able to attract and/or retain

masculine mates than relatively unattractive women are (Little et al., 2001; Penton-Voak et al., 2003; Vukovic et al., 2008).

Surprisingly, very little research has investigated whether personality factors predict women's face preferences. However, recent research into the physical and behavioral correlates of extraversion leads to the hypothesis that extraversion may predict women's preferences for masculine men. Extraversion, but not neuroticism, openness to experience, agreeableness or conscientiousness, is positively associated with symmetry in women's faces (Fink, Neave, Manning, & Grammer, 2005; Pound, Penton-Voak, & Brown, 2007). That symmetry is a putative measure of developmental stability (Møller & Swaddle, 1997) raises the possibility that extraversion may be an index of women's mate quality. Indeed, extraversion, but not the other 'Big 5' personality factors, is positively associated with women's social status (Anderson, John, Keltner, & Kring, 2001). Extraversion is also correlated with women's facial attractiveness (Penton-Voak, Pound, Little, & Perrett, 2006). These findings, together with those for condition-dependent masculinity preferences, raise the possibility that extraversion may be positively correlated with women's preferences for masculine men.

We tested for positive correlations between women's preferences for masculinity in men's faces and the 'Big 5' personality factors (extraversion, neuroticism, openness to experience, agreeableness, and conscientiousness), hypothesizing that extraversion, but not the other personality factors, would predict masculinity preferences. We also assessed women's preferences for masculinity in women's faces in order to test whether the predicted relationship between preferences and extraversion is specific to attractiveness judgments of potential mates, or if it also

* Corresponding author. Address: Face Research Laboratory, School of Psychology, University of Aberdeen, Scotland, UK. Tel.: +44 1224 272000.

E-mail address: lisa.welling@abdn.ac.uk (L.L.M. Welling).

occurs for judgments of same-sex individuals. Finally, we tested if extraversion mediates the positive relationship between women's self-rated attractiveness and their preferences for masculine men that has been reported in previous studies (Little et al., 2001; Vukovic et al., 2008).

2. Methods

2.1. Stimuli

Stimuli were 40 pairs of faces (20 male, 20 female), each pair consisting of a masculinized version and a feminized version of one face that differed only in two-dimensional shape and were matched in all other regards. These stimuli have been used in previous studies of variation in face preferences and differ reliably in perceived masculinity (Welling et al., 2007).

2.2. Personality inventory

We assessed the "Big 5" personality factors using Buchanan et al.'s (2005) *Five-Factor Personality Inventory for use on the Internet*, a 41-item inventory (7 items assessing openness to experience, 10 assessing conscientiousness, 9 assessing extraversion, 7 assessing agreeableness, and 8 assessing neuroticism) based on Goldberg's (1999) *International Personality Item Pool*. Internal consistency for each subscale is high (alphas ranging from .74 to .88).

2.3. Procedure

Women ($N = 808$, mean age = 18.22 years, $SD = 1.09$) were shown the 40 pairs of faces (each pair consisting of a masculinized and feminized version of the same individual) and indicated which face in each pair they thought was the more attractive. The order in which pairs were presented and the side of the screen on which any particular face was shown were fully randomized. Each participant also completed Buchanan et al.'s (2005) personality inventory and rated their own attractiveness using a 7-point scale (1 = very unattractive, 7 = very attractive).

The study was run online. Previous research has demonstrated consistent findings for internet- and lab-based studies of variation in face preferences (e.g., Jones et al., 2007; Welling, Jones, & DeBruine, 2008).

2.4. Initial processing of data

For each participant, we calculated the proportion of trials on which they chose the masculine versions of men's faces as more attractive than the feminine versions. Corresponding values were also calculated for judgments of women's faces.

Following Buchanan et al. (2005), we calculated scores for agreeableness ($M = 27.95$, $SD = 6.57$), conscientiousness ($M = 30.77$, $SD = 9.05$), neuroticism ($M = 24.00$, $SD = 8.88$), extraversion ($M = 28.80$, $SD = 10.62$), and openness to experience ($M = 30.51$, $SD = 6.64$) from the questionnaire responses. Our means and standard deviations are similar to those reported in Buchanan et al. (2005).

3. Results

3.1. Personality factors and face preferences

First, we analyzed women's face preferences using ANCOVA [within-subjects factor: *sex of face* (male, female); covariates: *participant age, agreeableness, conscientiousness, neuroticism, extraversion, openness to experience*]. There were significant main effects of *openness to experience* ($F(1,801) = 20.86$, $p < .001$) and *extraver-*

sion ($F(1,801) = 3.95$, $p = .047$) and significant interactions between *sex of face* and *extraversion* ($F(1,801) = 19.11$, $p < .001$) and *sex of face* and *openness to experience* ($F(1,801) = 6.21$, $p = .013$). No other effects were significant (all $F < 2.78$, all $p > .09$).

Next, we carried out correlation analyses to interpret the interactions described above. *Extraversion* was positively correlated with the strength of women's preferences for masculinity in men's faces ($r = .17$, $p < .001$), but not women's faces ($r = -.06$, $p = .122$). The simple correlation coefficient for men's faces was significantly greater than that for women's faces ($z = 4.65$, $p < .001$). *Openness to experience* was negatively correlated with the strength of women's preferences for masculinity in both men's faces ($r = -.14$, $p < .001$) and women's faces ($r = -.090$, $p = .010$). These simple correlation coefficients were not significantly different to one another ($z = 1.02$, $p = 0.30$).

Finally, we used one-sample *t*-tests to compare the proportion of trials on which women chose the more masculine face as the more attractive with what would be expected by chance alone (i.e., 0.5). Women preferred feminine versions to masculine versions when judging both women's ($t(808) = -64.46$, $p < .001$, $M = 0.17$, $SEM = 0.005$) and men's ($t(808) = -8.36$, $p < .001$, $M = 0.43$, $SEM = 0.008$) faces.

3.2. Self-rated attractiveness, extraversion, and face preferences

Extraversion and self-rated attractiveness were positively correlated ($r = .32$, $p < .001$). Women's preferences for masculinity in men's faces were positively, but weakly, correlated with self-rated attractiveness ($r = .08$, $p = .028$). Partial correlation analyses showed that the relationship between extraversion and masculinity preference remained significant when controlling for self-rated attractiveness ($r = .15$, $p < .001$), but that the relationship between self-rated attractiveness and masculinity preference was not significant when controlling for extraversion ($r = .02$, $p = .497$).

4. Discussion

As we predicted, extraversion, but not the other 'Big 5' personality factors, was positively correlated with the strength of women's preferences for masculinity in men's, but not women's, faces. Since extraversion is correlated with markers of women's mate quality (i.e., facial symmetry, social status, and facial attractiveness, Anderson et al., 2001; Fink et al., 2005; Penton-Voak et al., 2006; Pound et al., 2007), our finding for extraversion and women's face preferences is consistent with the proposal that indices of women's own mate quality are positively related to the strength of their preferences for masculine men (Little et al., 2001; Penton-Voak et al., 2003; Vukovic et al., 2008). As far as we are aware, ours is the first study to link extraversion and women's masculinity preferences. That extraversion predicted women's preferences for masculinity in men's, but not women's, faces suggests that our findings are not due to a possible general response bias, whereby extraverted women may be simply more attentive to faces generally.

We also found that women's self-rated attractiveness was positively correlated with both extraversion and their preferences for masculinity in men's faces. However, while the association between extraversion and women's preferences for masculine men remained significant when controlling for the effects of self-rated attractiveness, the association between self-rated attractiveness and women's preferences for masculine men was not significant when controlling for the effects of extraversion. These findings suggest that extraversion may mediate the effect of self-rated attractiveness on women's masculinity preferences and suggest that extraversion may be an important psychological factor for condition-dependent

mate preferences. Some studies have found that condition-dependent masculinity preferences are more pronounced when women judge men's attractiveness as possible long-term partners than when women judge men's attractiveness as possible short-term partners (Little et al., 2001; Penton-Voak et al., 2003). Thus, further research is needed to investigate how the association between extraversion and masculinity preference is affected by varying the temporal context of the desired relationship. The unexpected relationship between openness to experience and preferences for femininity in men's and women's faces requires replication.

Sociosexual orientation (i.e., variation in willingness to engage in uncommitted sexual relations, Simpson & Gangestad, 1991) is associated with extraversion (Wright & Reise, 1997) and women's preferences for male facial masculinity (Waynforth, Delwadia, & Camm, 2005, but see Provost, Kormos, Kosakoski, & Quinsey, 2006). However, sociosexuality is also associated with low agreeableness and this relationship is independent of that between extraversion and sociosexuality (Wright & Reise, 1997). That we found no relationship between agreeableness and face preferences therefore suggests that our finding for extraversion is unlikely to be an artefact of possible effects of sociosexuality.

Studies of individual differences among women in their masculinity preferences have typically emphasized the effects of own attractiveness (Little et al., 2001; Penton-Voak et al., 2003; Vukovic et al., 2008) and/or changes in fertility during the menstrual cycle (Penton-Voak et al., 1999; Welling et al., 2007). Our findings, however, suggest that individual differences in extraversion also predict variation in women's preferences for masculinity in men's faces, potentially because extraversion is a behavioral index of women's mate quality. That the association between self-rated attractiveness and women's preferences for masculine men appears to be mediated by extraversion is consistent with this proposal. Further investigation into the role of personality in condition-dependent mate preferences may be a fruitful line of research.

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