



FlashReport

Integrating social knowledge and physical cues when judging the attractiveness of potential mates

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ABSTRACT

Although many women find masculine men physically attractive, the perception that such men are prone to infidelity may limit their appeal as romantic partners. To explore this issue, we first investigated the interplay between the effects of men's face shape (masculinity versus femininity) and social knowledge of men's behavior in previous romantic relationships (faithful versus unfaithful) on women's judgments of men's attractiveness. Analyses suggested that the extent to which women rated masculine men to be more attractive than feminine men was significantly greater when judging men labeled as faithful than when judging men labeled as unfaithful. In a second experiment, we obtained similar results when the women in our study were instructed to imagine they were on a date with each of the men and that, while on the date, they observed him either flirting or not flirting with another woman. These interactions suggest that social knowledge about men's behavior in romantic relationships can offset one of the costs that women associate with choosing a masculine mate, increasing the appeal of masculine men. More fundamentally, these findings suggest integration of social knowledge and information from facial cues in women's attractiveness judgments.

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Introduction

Most studies of facial attractiveness have focused on the effects of physical characteristics that are relatively invariant (e.g., effects of symmetry, averageness, and sexual dimorphism, Rhodes, 2006). However, several behavioral and neurobiological studies recently reported interactions between effects of invariant facial characteristics and others' attitudes and intentions signaled by implicit cues, such as gaze direction and emotional expressions (reviewed in Main, DeBruine, Little, & Jones, 2010). fMRI experiments suggest the reward value of physically attractive faces is greater when they appear to demonstrate positive social interest in the viewer (e.g., make eye contact or smile, Kampe, Frith, Dolan, & Frith, 2001; O'Doherty et al., 2003). Similarly, participants report stronger attraction to physically attractive faces, relative to less physically attractive faces, when they are smiling at the participant than when they are shown with averted gaze or more negative expressions (Conway, Jones, DeBruine, Little, Hay, et al., 2008; Jones, DeBruine, Little, Conway, & Feinberg, 2006; Main et al., 2010). These enhanced preferences for physically attractive individuals who appear willing to reciprocate investment of social effort may function to promote efficient allocation of social effort (i.e., allocate more social effort to

attractive individuals who appear willing to reciprocate, Jones et al., 2006).

Although previous studies have shown that more explicit social knowledge about an individual (e.g., knowledge that they are trustworthy) can influence attraction (e.g., Barclay, 2010), it is not known whether (1) people integrate this social knowledge with information from physical characteristics in faces when judging others' attractiveness, (2) such knowledge and stereotypic information from facial cues have independent, non-interacting effects on attraction, or (3) one type of information overrides the other. Integrating these types of information may be particularly important for women's attraction to masculine versus feminine men, however.

Masculine characteristics in men are associated with many attributes that women consider attractive (e.g., good long-term health and physical strength, Fink, Neave, & Seydel, 2007; Rhodes, Chan, Zebrowitz, & Simmons, 2003; Thornhill & Gangestad, 2006), but are also associated with anti-social personality traits that women find unattractive in long-term partners (e.g., a tendency to infidelity, Hughes, Dispenza, & Gallup, 2004). Thus, attraction to masculine versus feminine men may reflect how women resolve this trade-off between the costs and benefits of choosing a masculine mate (Gangestad & Simpson, 2000). Because the correlations between these attributes and masculine characteristics in men can be rather weak (Rhodes, 2006), however, integrating information from physical cues in men's faces with knowledge about their typical behavior in romantic relationships could help women maximize the potential benefits of their mate choices. For example, masculine men are perceived to be

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particularly prone to infidelity, which may detract from their attractiveness (Kruger, 2006). That a man has been faithful to his previous romantic partners may, therefore, have a greater positive effect on the attractiveness of masculine than feminine men.

Here, we investigated the effects of social knowledge on women's attractiveness judgments of masculinized versus feminized versions of men's faces. We assessed women's ratings of masculinized versus feminized images of men's faces when judging men labeled as having been either faithful or unfaithful to their previous romantic partners, hypothesizing that women would report stronger attraction to masculine versus feminine men when judging 'faithful' than 'unfaithful' men. Such results would suggest that women integrate social knowledge and information from physical cues when assessing men's attractiveness. If both social knowledge and stereotypic perceptions from facial appearance affect attractiveness independently, however, we would expect only main effects of both factors. If social knowledge overrides stereotypic perceptions, we would expect only a main effect of social knowledge. In a second experiment, we tested for evidence of an interaction between the effects of social knowledge and masculinized versus feminized shape cues when women were instructed to imagine they were on a date with each of the men depicted and that, while on the date, they observed him either flirting or not flirting with another woman.

Experiment 1

Methods

Participants

Heterosexual women ($N = 144$, mean age = 2280 years, $SD = 4.93$ years) were recruited for an online study of attractiveness by following links from various social bookmarking sites (e.g., stumbleupon). Previous studies have demonstrated that online and laboratory studies of attractiveness judgments produce very similar patterns of results (Conway, Jones, DeBruine, & Little, 2008; Fraccaro et al., 2010).

Stimuli

Following previous studies (DeBruine, Jones, Crawford, Welling, & Little, 2010; Perrett et al., 1998), we used prototype-based image transformations to manipulate 2D shape in digital face images (Fig. 1). 50% of the linear shape differences between symmetrized male and female prototypes were added to or subtracted from face images of 28 young White adult men (Mean age = 23.9 years, $SD = 3.53$ years).



Fig. 1. Examples of masculinized (left) and feminized (right) male face images used in our experiments.

These images were taken under standardized lighting conditions, with neutral expressions, and against a constant background, and were purchased from an online image database (www.3d.sk). This process creates masculinized and feminized versions of the images that differ in sexual dimorphism of 2D shape and that are matched in other regards (e.g., identity, skin color and texture, Tiddeman, Perrett, & Burt, 2001).

Procedure

Participants were told that they would be asked to rate men's faces for attractiveness. However, they were also told that, when rating the men's attractiveness, we would like them to imagine that these are men that they don't know, but who are members of the same social club as some of their friends. Some of the men have a reputation for being unfaithful to their girlfriends and are labeled 'unfaithful' (i.e., a text box under the face image will contain the text 'unfaithful'). The other men have a reputation for being faithful to their girlfriends and are labeled 'faithful' (i.e., a text box under the face image will contain the text 'faithful').

Each participant was then presented 28 male face images (each a different individual), in a fully randomized order, and was instructed to rate each man's attractiveness using a 1 (very unattractive) to 7 (very attractive) scale. Seven of the men were presented as masculinized and labeled 'faithful', seven were presented as feminized and labeled 'faithful', seven were presented as masculinized and labeled 'unfaithful', and seven were presented as feminized and labeled 'unfaithful'. The unmanipulated versions of the faces in each of the four groups of seven men possessed equivalent rated masculinity (based on masculinity ratings of the unmanipulated faces that were made by 100 women in an initial pilot study). Which of the four groups were presented to an individual woman as masculinized or feminized and faithful or unfaithful was fully counterbalanced across participants. Inter-rater agreement for attractiveness ratings was very high in each condition (all Cronbach's alphas > 0.82).

Results

Stimuli, rather than participants, served as our unit of analysis. Thus, for each face presented, we calculated (separately) the average attractiveness rating in each of the four conditions. None of these scores differed significantly from a normal distribution (all Kolmogorov-Smirnov $Z < 0.81$, all $p > 0.51$).

A repeated-measures ANOVA with the factors *facial characteristic* (masculinized, feminized) and *social knowledge* (unfaithful, faithful) revealed significant main effects of *facial characteristic* ($F(1,27) = 7.88$, $p < 0.001$, partial $\eta^2 = 0.23$) and *social knowledge* ($F(1,27) = 114.8$, $p < 0.001$, partial $\eta^2 = 0.81$). Masculinized versions ($M = 2.60$, $SEM = 0.12$) were rated as more attractive than feminized versions ($M = 2.38$, $SEM = 0.12$) and men were rated as more attractive when labeled 'faithful' ($M = 2.66$, $SEM = 0.12$) than when labeled 'unfaithful' ($M = 2.32$, $SEM = 0.11$). However, these effects were qualified by a significant interaction between *facial characteristic* and *social knowledge* ($F(1,27) = 4.80$, $p = 0.037$, partial $\eta^2 = 0.15$, Fig. 2).

Masculine versions were rated as more attractive than feminine versions in the faithful condition ($t(27) = 3.23$, $p < 0.001$). Masculine versions also tended to be rated as more attractive than feminine versions in the unfaithful condition, but this difference was not significant ($t(27) = 1.99$, $p = 0.057$). Men were rated as more attractive in the faithful than the unfaithful conditions for both masculinized ($t(27) = 8.25$, $p < 0.001$) and feminized ($t(27) = 7.66$, $p < 0.001$) versions. The interaction reported above indicates that the effect of masculinity was significantly greater in the faithful than unfaithful condition and the effect of fidelity was significantly greater for masculinized than feminized versions.

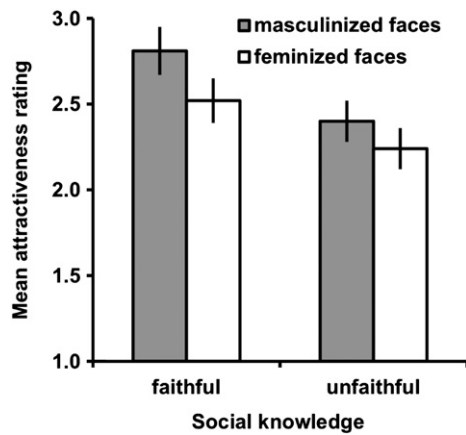


Fig. 2. The significant interaction between facial characteristic and social knowledge in Experiment 1.

Experiment 2

Methods

Methods were identical to those in Experiment 1, except that participants were 138 women (Mean age = 22.38 years, SD = 4.30 years) who had not taken part in Experiment 1. Instructions were also slightly different from Experiment 1. Participants were told to imagine they were on a date with each of the men and that, while on the date, they saw another woman flirting with him. In some cases, the men flirted back. These men were labeled 'did flirt'. In other cases the men did not flirt back. These men were labeled 'did not flirt'. Interrater agreement for attractiveness ratings was very high in each condition (all Cronbach's alphas > 0.80) and none of these sets of scores differed significantly from a normal distribution (all Kolmogorov-Smirnov $Z < 1.14$, all $p > 0.15$).

Results

A repeated-measures ANOVA with the factors facial characteristic (masculinized, feminized) and social knowledge (did not flirt, flirted) revealed significant main effects of facial characteristic ($F(1,27) = 11.2$, $p < 0.001$, partial $\eta^2 = 0.29$) and social knowledge ($F(1,27) = 36.3$, $p < 0.001$, partial $\eta^2 = 0.57$). Masculinized versions ($M = 2.66$, $SEM = 0.12$) were rated as more attractive than feminized versions ($M = 2.34$, $SEM = 0.13$) and men were rated as more attractive when labeled 'did not flirt' ($M = 2.62$, $SEM = 0.12$) than when labeled 'flirted' ($M = 2.39$, $SEM = 0.13$). The interaction was significant

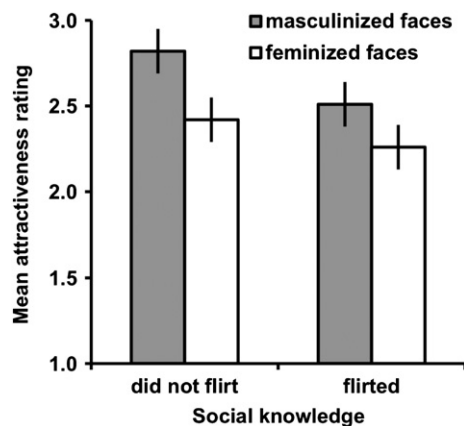


Fig. 3. The significant interaction between facial characteristic and social knowledge in Experiment 2.

($F(1,27) = 4.75$, $p = 0.038$, partial $\eta^2 = 0.15$, Fig. 3). Masculine versions were rated as more attractive than feminine versions in both the 'did not flirt' ($t(27) = 4.69$, $p < 0.001$) and 'flirted' ($t(27) = 2.16$, $p = 0.040$) conditions. Men were rated as more attractive in the 'did not flirt' than the 'flirted' conditions for both the masculinized ($t(27) = 5.62$, $p < 0.001$) and feminized ($t(27) = 3.46$, $p = 0.002$) versions.

Discussion

The extent to which women reported stronger attraction to masculine over feminine men was significantly greater when judging men with a reputation for being faithful than when judging men with a reputation for being unfaithful (Experiment 1) and when judging men who did not flirt with another woman on a hypothetical date than when judging men who did flirt (Experiment 2). These interactions suggest that women integrate information from physical cues in men's faces with social knowledge about those men's behavior and complement those observed between the effects of physical and social cues in faces in previous research (e.g., Jones et al., 2006; Main et al., 2010).

Trade-off theories of attractiveness judgments propose that the strength of women's attraction to masculine men reflects, at least in part, how they resolve the trade-off between the costs (e.g., tendency to infidelity, Hughes et al., 2004) and benefits (e.g., good long-term health and physical strength, Fink et al., 2007; Rhodes et al., 2003; Thornhill & Gangestad, 2006) that would be associated with choosing a masculine mate (Gangestad & Simpson, 2000). To date, however, most evidence for this proposal has come from studies demonstrating that individual differences in women's circumstances that affect the nature of this trade-off shape women's judgments of men's attractiveness in predictable ways. For example, women's interest in pursuing short-term, uncommitted relationships (e.g., Provost, Troje, & Quinsey, 2008), women's own attractiveness (Little, Burt, Penton-Voak, & Perrett, 2001; Vukovic et al., 2010), and regional differences in health- and violence-related factors (Brooks et al., 2011; DeBruine et al., 2010, 2011, DeBruine, Jones, Little, Crawford, & Welling, 2011; see also Penton-Voak et al., 2004) are correlated with the strength of women's reported attraction to masculine men. Here, we present a different kind of evidence for trade-off theories of attraction; knowledge about men's behavior appears to reduce the perceived costs of preferring those specific masculine mates and increase women's reported attraction to masculine men. Langlois et al. (2000) has previously suggested that stereotypes associated with facial appearance influence attitudes towards individuals even when other information is available for people to base their judgments on. Our findings extend this claim by suggesting that social knowledge might also modulate the effects of facial appearance on social perception.

An alternative explanation for our findings is that masculine men displaying masculine-atypical behaviors, such as fidelity, are judged as especially attractive because stereotype violation makes individuals more distinctive and/or memorable. We suggest that this explanation is unlikely for three reasons. First, if our results were simply due to stereotype violation, one would expect that masculine men would be rated more attractive when paired with feminine behaviors, but that feminine men would be rated more attractive when paired with masculine behaviors. However, in both experiments, presenting incompatible behavioral information increased the appeal of masculine, but not feminine, men, suggesting that stereotype violation alone cannot explain our results. Second, stereotype violation increases the cognitive resources required to process individuals (Macrae et al., 1994), which decreases their attractiveness (Rhodes, 2006). Indeed, distinctiveness is negatively correlated with facial attractiveness (Rhodes, 2006). Third, while women's memory for events involving men displaying masculine characteristics is

enhanced, this enhancement does not alter subsequent masculinity preferences (Allan et al, in press; Smith et al, in press). Together, these findings suggest that our findings are unlikely to reflect effects of stereotype violation alone.

An unresolved issue is whether effects similar to those we observed would also occur in more naturalistic (i.e., real) social settings. On this point, we note that the extent to which partnered women rate masculinized versions of men's faces as more attractive than feminized versions predicts the masculinity of their romantic partners, linking attractiveness ratings of face images to actual partner choice (Burriss, Welling and Puts, 2011; DeBruine et al., 2006). Other recent work suggests that social information gleaned during speed dates influences attractiveness judgments in ways that are strikingly similar to the effects of social knowledge acquired indirectly in laboratory experiments (e.g., Place et al., 2010). These findings suggest the effects we observed may well generalize to choices during actual interactions. Nonetheless, we suggest that studies using richer, more natural social contexts to explore interactions between the effects of perceptions of men's fidelity and masculinity are a potentially important direction for future research. A challenge for such work would be to design practical experiments that decouple the natural correlation between physical masculinity and sexual behavior in men, whereby women are more likely to perceive masculine men as unfaithful (Kruger, 2006) and fidelity and masculinity are positively correlated among men (Hughes et al., 2004). Without decoupling these traits, perceived fidelity and masculinity would be confounded and interactions could come about simply because of systematic differences in the way in which women perceive the fidelity of relatively feminine and masculine men, irrespective of the men's actual (i.e., observed) behavior.

We found that women reported significantly stronger attraction to masculine men over feminine men when judging men who show cues of high commitment than when judging men who show cues of low commitment. These results suggest that women integrate social knowledge about behavior and information from physical facial cues when assessing men's attractiveness. Mating effort is a finite resource and the need to allocate it in an efficient manner is likely to influence attractiveness judgments and mate preferences (e.g., Conway, Jones, DeBruine, & Little, 2008; Jones et al., 2006). Integrating explicit social knowledge and information from physical cues in men's faces may function to promote efficient allocation of this effort by, in this case, encouraging attraction to men with an optimal balance of health/strength and faithfulness/commitment. More fundamentally, our study presents new evidence for trade-off theories of attraction and highlights the integrative processes that may underpin judgments of facial attractiveness.

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