Original Article

Do women’s preferences for men’s facial hair change with reproductive status?

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Women’s preferences for masculine traits are reported to be greater among young reproductively capable women, particularly just prior to ovulation, than among pregnant and postmenopausal women. This study is the first to investigate whether women’s preferences for men’s facial hair follow this pattern. We conducted surveys quantifying reproductive status and attractiveness ratings for facial hair (clean-shaven, light stubble, heavy stubble, and full beards) among 426 women from Wellington City, New Zealand. Results showed that pregnant, pre- and postmenopausal women rated faces that were clean-shaven, or with light and heavy stubble, as more attractive than full beards. Postmenopausal women gave higher scores for all degrees of facial hair, including full beards, than premenopausal and pregnant women. Premenopausal women at the high fertility phases of the menstrual cycle gave higher ratings for heavy stubble than participants at the low fertility phase or who were using contraceptives. However, these differences were not statistically significant, and the main effects were driven primarily by the low ratings ascribed to full beards. Women with partners that were clean-shaven judged clean-shaven faces as most attractive, whereas women with partners with heavy stubble or full beards judged heavy stubble as most attractive. Although women’s current partner and father’s degree of beardedness were positively correlated, their fathers’ beardedness showed little relationship to attractiveness judgments of facial hair. These results demonstrate that all women by no means consider beards unattractive. However, preferences vary only subtly with respect to hormonal, reproductive, and relationship status. Key words: attractiveness, beard, human evolution, menstrual cycle, sexual selection. [Behav Ecol]

INTRODUCTION

Sexually dimorphic traits determine male attractiveness in many species (Andersson 1994), including humans (Gangestad and Scheyd 2005). Indeed, masculinity in men’s physique is associated with greater long-term health, competitive ability, and reproductive success (Rhodes et al. 2003; Thornhill and Gangestad 2006; Archer 2009). Although theories of sexual selection predict that women should find masculine facial characters most attractive in men, studies reveal that women prefer relatively less-masculine faces (Perrett et al. 1998), or state only weak preferences for facial masculinity (Rhodes 2006). This may reflect a propensity for facial masculinity to be associated with negative personality traits, less interest in long-term relationships, and lower paternal investment (Perrett et al. 1998; Kruger 2006). Biparental care and pair bonding are defining characteristics in the evolution of human mating, thus less-masculine men may be more attractive as they are perceived as more amenable partners and providers who invest in their offspring.

Although characteristically masculine traits are less appealing in a long-term partner, they are preferred in a short-term mate (Little et al. 2011). This may reflect different mating strategies in relation to the qualities signaled by masculine traits as they rely for their expression on testosterone, which putatively has immunosuppressant effects (Grossman 1985). Indeed, Rantala et al. (2012) found that men with the most attractive faces also had higher serum testosterone and greater antibody response to a hepatitis B vaccine. Women’s preferences for masculine traits are also stronger during the late follicular, more fertile, period of the menstrual cycle, when the benefits of mating with a masculine male can be realized (Gangestad and Thornhill 2008). Hummel et al. (1991) were among the first to find this pattern in women’s preferences for the scent of androstene and it has since been identified for numerous traits including facial shape (Penton-Voak et al. 1999), skin complexion (Frost 1994), vocal pitch (Puts 2005), masculinity (Little, Jones, and Berriss 2007), height (Pawlowski and Jasienska 2005), and various aspects of scent (Gammer 1993; Havlicek et al. 2005). In contrast, during pregnancy and the luteal phase of the menstrual cycle, preferences for masculine-looking faces are lower (Jones, Little, et al. 2005; Jones, Perrett, et al. 2005). Preferences for facial masculinity also change as women transition into menopause, so that attractiveness judgments of more feminized male and female faces are greater among postmenopausal than among premenopausal women (Little et al. 2010; Jones et al. 2011). This is argued to reflect greater mate preferences for masculinity and higher levels of derogation toward potential same-sex competitors among more fertile women than among nonreproductively capable women (Little et al. 2010; Jones et al. 2011). Taken together, women’s preferences for masculinity appear to be greater during their reproductive years and when conception is most likely than during the luteal phase, pregnancy, and postmenopause.

Interestingly, few studies have reported women’s preferences for body and facial hair at different reproductive stages. Human hairlessness may have evolved as it reduced the impact of...
disease-carrying ectoparasites (Rantala 2007) and aided in maintaining thermal homeostasis during upright bipedal locomotion (Wheeler 1992a, 1992b). However, testosterone promotes the patterned growth of hair on the face and body (Randall 2008). The marked sexual dimorphism in beards and body hair suggests a role of sexual selection in their origin, possibly as signals of underlying endocrine condition and sexual maturity. Yet the evidence is largely equivocal, with studies reporting that beards either increase (Pellegrini 1973; Reed and Blunk 1990) or decrease male attractiveness (Feinman and Gill 1977; Wogalter and Hosie 1991; Muscarella and Cunningham 1996; Dixon and Vasey 2012). The artificial or natural stimulus sets chosen (Pellegrini 1989), the levels of intermediate facial hair growth presented to raters (Neave and Shields 2008), and the stage of female raters’ menstrual cycles might all have influenced these findings. Photographs of men’s torsos with pronounced chest hair were judged as most attractive by postmenopausal women and women at the low fertility phase of the menstrual cycle (Rantala et al. 2010). To our knowledge, no equivalent study to date has investigated women’s preferences for facial hair at different reproductive stages.

In the present study, we used natural photographs of men when clean-shaven, with 2 intermediate stages of beard growth and full beards in 6 analyses of women’s preferences for facial hair. In Analysis 1, we tested whether preferences for facial hair were greater among women in their reproductive years than among postmenopausal and pregnant women (Little et al. 2010; Jones et al. 2011). We then tested whether women with higher potential fertility judged facial hair as more attractive using a composite measure of fertility (Analysis 2), distinct phases of the menstrual cycle (Analysis 3), and a daily measure of the likelihood of conception (Analysis 4). Women’s preferences for masculine facial shape and body hair are positively correlated with that of their current partners (DeBruine et al. 2006; Rantala et al. 2010) and their fathers (Wisewksa et al. 2007; Rantala et al. 2010). Thus, our fifth and sixth analyses tested whether women’s preferences for facial hair mirrored their current partner or their father’s degree of facial hair.

**MATERIAL AND METHODS**

**Photographic stimuli**

The faces of 10 men of European descent (mean age = 25.50, standard deviation [SD] = 3.57, range 20–30 years) were photographed clean-shaven, with 5 days (light stubble) and 10 days (heavy stubble) of facial hair growth and with full beards (defined as at least 6 weeks without shaving). Participants posed smiling facial expressions generated using the Facial Action Coding System (Ekman et al. 2002). Photographs were taken using a Canon Power Shot digital camera at a resolution of 8.0 megapixels, 150 cm away from the participant under controlled lighting. Images were cropped using Adobe Photoshop 7.0 so that only the face and neck were shown (Figure 1).

**Questionnaires**

This research was approved by the Human Ethics Committee at Victoria University of Wellington and is in accordance with the Helsinki Declaration of 1975. Participation was voluntary, anonymous, individuals could withdraw from the study at any point, and female researchers conducted all the interviews.

Participants were recruited opportunistically from the general public in and around Wellington City, New Zealand and interviewed individually. They first completed a rating study in which 40 images comprised of 10 men with 4 levels of facial hair (clean-shaven, light stubble, heavy stubble, and full beards) were rated for attractiveness using a 6-point Likert scale (0 = very low to 5 = very high). Images were presented individually in a random sequence in a slide presentation on a laptop computer using Microsoft Power Point.

Participants then completed a reproductive status questionnaire in which they stated whether they were currently using hormonal contraceptives, how long ago (in days) their first day of their last menstrual bleeding occurred, their cycle regularity, whether or not they were pregnant, or if they no longer had menstrual cycles as the result of menopause. Participants also scored the degree of facial hair of their current partner and were asked to recall their earliest childhood memories of their biological father’s degree of facial hair using a scale, where 0 = clean-shaven, 1 = light stubble, 2 = heavy stubble, and 3 = full beards.

**Participants**

Four hundred and twenty-six women (mean age = 29.93 years; SD = 14.29) completed surveys. Responses from the total sample were then portioned into subsets for our 6 analyses. The subsample sizes and mean ages (+SD) for each analysis are included in Table 1. The method of categorizing participants for each analysis is described below.

*Analysis 1.* We compared preferences between premenopausal women who were not using contraceptives with postmenopausal and pregnant women.

*Analysis 2.* Following previous studies (Penton-Voak et al. 1999; Rantala et al. 2010), participants at days 0–5 or 15–28 days since menstes were placed in the low fertility group and those between days 6 and 14 were classed as the high fertility group. Preferences among low and high fertility participants were compared with participants using contraceptives.

*Analysis 3.* To test whether preferences for facial hair differed at distinct phases of the menstrual cycle, we used categories defined by Regan (1996) to compare responses at the menses (days 0–5), luteal (days 15–28), and the follicular (days 6–14) phases.

*Analysis 4.* Preferences for each level of facial hair were tested against a linear measure of the daily likelihood of conception using data from Wilcos et al. (2001) (Table 1, column 1). In that study, the likelihood of pregnancy from a single act of intercourse for each day of the menstrual cycle was calculated for 221 women. This approach has been employed in several previous studies (Little et al. 2008; Morrison et al. 2010).

*Analysis 5.* We compared preferences for facial hair among women currently in a relationship against the degree of facial hair of participant’s current partners.
Analysis 6. Preferences for facial hair and current partner’s degree of beardedness were compared against participant’s fathers’ beardedness among women whose biological father was present during their childhood.

Statistical analyses

In order to control for intrasubject variability in the ratings of the 10 faces, we weighted the ratings of each male based on the total average rating of all the men over all levels of facial hair. These weighted aggregate ratings were calculated separately for each of the 6 studies under examination and entered as dependent variables in Anovas where facial hair (clean-shaven, light stubble, heavy stubble, full beard) was the within-subjects factor. The between-subjects factors in the Anovas were as follows—Analysis 1: reproductive status (premenopausal, postmenopausal, and pregnant); Analysis 2: fertility (high, low, and contraceptive users); Analysis 3: menstrual cycle phase (menses, luteal, and follicular); Analysis 5: partner’s facial hair (clean-shaven, light stubble, heavy stubble, full beard). For each analysis, we tested for statistical significance by examining whether the 95% confidence intervals (CIs) of the groups overlapped with the point estimates of other groups. We also calculated Cohen’s $d$ effect sizes to test for the magnitude of the effect for ratings between the facial hair levels that were given the highest and lowest ratings.

Analysis 4 used generalized linear regressions to measure the attractiveness of each level of facial hair against the daily probability of conception. To evaluate whether differences between levels of facial hair and the likelihood of conception were significant, we examined the overlap of the 95% CIs of the slopes between the groups.

RESULTS

Analysis 1: reproductive status and preferences for facial hair

There were significant main effects of facial hair and reproductive status on attractiveness ratings, but no facial hair $\times$ reproductive status interaction (Table 2). Premenopausal participants gave higher overall ratings across all categories of facial hair (mean = 2.18, upper 95% CI = 2.23, lower 95% CI = 2.13) followed by pregnant (mean = 1.86, upper 95% CI = 1.91, lower 95% CI = 1.80) and premenopausal participants (mean 1.73, upper 95% CI = 1.76, lower 95% CI = 1.71). Premenopausal, postmenopausal, and pregnant women all gave higher ratings to clean-shaven, light stubble, and heavy stubble than full beards (Figure 2). Postmenopausal women gave higher attractiveness ratings than premenopausal women for clean-shaven ($d = 0.42$), light stubble ($d = 0.40$), heavy stubble ($d = 0.67$), and full beards ($d = 0.33$). Likewise, postmenopausal women gave higher ratings than pregnant women for clean-shaven ($d = 0.33$), light stubble ($d = 0.32$), heavy stubble ($d = 0.32$), and full beards ($d = 0.16$). Pregnant women gave significantly higher ratings than premenopausal women for light stubble ($d = 0.10$) and full beards ($d = 0.17$), but not clean-shaven faces or heavy stubble (Figure 2).

Analysis 2: fertility, contraceptive use, and preferences for facial hair

There were significant main effects of facial hair and fertility on attractiveness ratings, but no facial hair $\times$ fertility interaction (Table 2). Premenopausal participants gave higher overall ratings across all categories of facial hair (mean = 2.18, upper 95% CI = 2.23, lower 95% CI = 2.13) followed by pregnant (mean = 1.86, upper 95% CI = 1.91, lower 95% CI = 1.80) and premenopausal participants (mean 1.73, upper 95% CI = 1.76, lower 95% CI = 1.71). Premenopausal, postmenopausal, and pregnant women all gave higher ratings to clean-shaven, light stubble, and heavy stubble than full beards (Figure 2). Postmenopausal women gave higher attractiveness ratings than premenopausal women for clean-shaven ($d = 0.42$), light stubble ($d = 0.40$), heavy stubble ($d = 0.67$), and full beards ($d = 0.33$). Likewise, postmenopausal women gave higher ratings than pregnant women for clean-shaven ($d = 0.33$), light stubble ($d = 0.32$), heavy stubble ($d = 0.32$), and full beards ($d = 0.16$). Pregnant women gave significantly higher ratings than premenopausal women for light stubble ($d = 0.10$) and full beards ($d = 0.17$), but not clean-shaven faces or heavy stubble (Figure 2).
Table 2
Analysis of variance of the effects of beardedness and reproductive status (Analysis 1), fertility (Analysis 2), and the menstrual cycle (Analysis 3) on attractiveness ratings

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Source of Variation</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analysis 1. Reproductive status</td>
<td>Anova</td>
<td>40.21</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Facial hair</td>
<td>21.55</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Reproductive status</td>
<td>113.68</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Facial hair × reproductive status</td>
<td>0.79</td>
<td>6</td>
</tr>
<tr>
<td>Analysis 2. Fertility status</td>
<td>Anova</td>
<td>20.23</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Facial hair</td>
<td>34.42</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Reproductive status</td>
<td>44.91</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Facial hair × fertility</td>
<td>1.17</td>
<td>6</td>
</tr>
<tr>
<td>Analysis 3. Menstrual cycle phase</td>
<td>Anova</td>
<td>12.99</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Facial hair</td>
<td>20.77</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Reproductive status</td>
<td>35.37</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Facial hair × cycle phase</td>
<td>1.16</td>
<td>6</td>
</tr>
</tbody>
</table>

(mean = 1.57, upper 95% CI = 1.60, lower 95% CI = 1.54). Participants at the high fertility phase gave their highest ratings to heavy stubble and lowest to full beards (d = 0.19). However, ratings for heavy stubble were not significantly higher than clean-shaven or light stubble (Figure 3A). Ratings were significantly higher for light stubble and clean-shaven faces than full beards (Figure 3A). Participants at the low fertility phase gave their highest ratings to clean-shaven faces and lowest to full beards (d = 0.27). Although preferences for clean-shaven faces were higher than light and heavy stubble, these differences were not statistically significant. Light and heavy stubble were also judged as significantly more attractive than full beards (Figure 3A). Participants using contraceptives also gave their highest ratings to clean-shaven faces and the lowest to full beards (d = 0.28). However, ratings for clean-shaven faces were not significantly higher than light or heavy stubble. Heavy and light stubble were more attractive than full beards (Figure 3A).

Analysis 3: preferences for facial hair at different phases of the menstrual cycle

There were significant main effects of facial hair and menstrual cycle phase on attractiveness ratings, but no facial hair × menstrual cycle phase interaction (Table 2). Participants at the late phase gave the highest overall ratings across all categories of facial hair (mean = 1.91, upper 95% CI = 1.96, lower 95% CI = 1.87), followed by participants at the follicular phase (mean = 1.87, upper 95% CI = 1.92, lower 95% CI = 1.82) and menses phase (mean = 1.80, upper 95% CI = 1.86, lower 95% CI = 1.74). Participants at the follicular phase gave their highest ratings to heavy stubble and their lowest to full beards (d = 0.20). However, ratings for heavy stubble were not significantly higher than light stubble or clean-shaven faces, both of which received higher attractiveness ratings than full beards (Figure 3B). Participants at the late phase gave their highest ratings to clean-shaven and lowest ratings to full beards (d = 0.32). Ratings for clean-shaven faces were not significantly higher than light or heavy stubble, which were both rated higher than full beards (Figure 3B). Participants at the menses phase gave their highest ratings for clean-shaven faces and lowest to full beards (d = 0.22). Heavy and light stubble were also judged to be more attractive than full beards (Figure 3B).

Analysis 4: likelihood of conception and preferences for facial hair

Linear regressions revealed significant relationships between the likelihood of conception and preferences for light (R² = 0.003, P = 0.013) and heavy stubble (R² = 0.003, P = 0.012) but not for clean-shaven faces (P = 0.246) or full beards (P = 0.084). However, the overlap of the 95% CIs of the slopes between all groups was pronounced (Figure 4) and hence no significant preferences across facial hair categories, as they related to likelihood of conception, were observed.

Analysis 5: preferences for facial hair and partner’s facial hair

There were significant main effects of facial hair, partner’s facial hair, and a facial hair × partner’s facial hair interaction on attractiveness ratings (Table 3). Women with clean-shaven partners gave their highest ratings to clean-shaven faces and their lowest ratings to full beards (d = 0.32). Among women with clean-shaven partners, ratings for clean-shaven faces were significantly higher than ratings for the same faces among women with partners with light stubble, heavy stubble, and full beards (Figure 5A). Among women with full-bearded partners, ratings were highest for heavy stubble and lowest for light stubble (d = 0.10). Women with partners with full beards judged full-bearded faces as significantly more attractive than women with clean-shaven, light, or heavy stubbled partners (Figure 5A). Women with partners with heavy stubble gave their highest ratings to heavy stubble faces and the lowest to full beards (d = 0.20). Finally, participants with partners with light stubble gave their highest ratings to clean-shaven faces and the lowest to full beards (d = 0.32; Figure 5A).
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Analysis 6: preferences for facial hair and father’s facial hair

There were significant main effects of facial hair and father’s beardedness, but no facial hair × father’s beardedness interaction (Table 3). Participants with clean-shaven fathers gave the highest overall ratings across all categories of facial hair (mean = 1.86, upper 95% CI = 1.89, lower 95% CI = 1.84), followed by participants with fathers with full beards (mean = 1.80, upper 95% CI = 1.84, lower 95% CI = 1.77), heavy stubble (mean = 1.56, upper 95% CI = 1.65, lower 95% CI = 1.47), and light stubble (mean = 1.51, upper 95% CI = 1.55, lower 95% CI = 1.47). Ratings were highest for clean-shaven faces and the lowest for full beards among participants with clean-shaven (d = 0.25), light stubble (d = 0.27), and full-bearded fathers (d = 0.22). However, none of the ratings for clean-shaven faces among these groups were significantly higher than light or heavy stubble (Figure 5B). Likewise, although participants with fathers with heavy stubble rated heavy stubble as most attractive and full beards as least attractive (d = 0.30), ratings for heavy stubble were not significantly higher than clean-shaven or light stubble (Figure 5B).

Among participants whose father was present during childhood, 318 were currently in a relationship. Pearson correlation revealed a significant positive relationship between current partner’s degree of facial hair and father’s facial hair (r = 0.126, N = 318, P = 0.025).

DISCUSSION

This study quantified women’s preferences for natural variation in men’s facial hair according to premenopausal, postmenopausal, and pregnant status (Analysis 1), fertility and likelihood of conception (Analyses 2–4), current partner’s facial hair (Analysis 5), and father’s beardedness (Analysis 6). Interestingly, across all contexts of reproductive and fertility status tested in Analyses 1–4, clean-shaven, light stubble, and heavy stubble were judged as equally more attractive than full beards. Women with clean-shaven partners preferred clean-shaven...
faces, whereas women with partners with heavy stubble and full beards preferred heavy stubble. Although the degree of beardedness of women’s current partner’s was weakly positively correlated with father’s beardedness, little relationship between women’s preferences for facial hair and their father’s beardedness was observed. Our findings provide important comparisons and contrasts with the body of research demonstrating women’s preferences for male body hair, where postmenopausal women stated stronger preferences for chest and abdominal hair than premenopausal, postmenopausal, and pregnant women. These findings are similar to those reported for women’s preferences for male body hair, where postmenopausal women stated stronger preferences for chest and abdominal hair than premenopausal women (Rantala et al. 2010). However, these patterns differ from those observed in studies of masculine facial shape, where postmenopausal preferences for masculine faces were lower than those of premenopausal women (Little et al. 2010; Jones et al. 2011). The decline androgen activity among ageing men is associated with decreased energy, physical strength, libido, and less pubic and facial hair (Chieffi 1949; Braver 2004; Jakiel et al. 2008). Thus, beards and body hair may be relatively more attractive among postmenopausal women as signals of underlying endocrine function. Conversely, pronounced body and facial hair may decrease male attractiveness among premenopausal women as it masks the craniofacial traits and masculinity that define mate value. Alternatively, our results may simply reflect a preference for older-looking men as the stimuli included young men and beards augment a man’s perceived age (Dixson and Vasey 2012). Indeed, Jones et al. (2011) found that less-masculine male faces were more attractive to postmenopausal women using stimuli that depicted age-matched men. As such, future studies using age-matched stimuli varying in beardedness would be valuable to confirm our findings.

The lower attractiveness ratings ascribed to full beards by premenopausal women may reflect avoidance of potentially costly partners, as full beards are perceived as more masculine, socially dominant, and physically aggressive (Neave and Shields 2008; Dixson and Vasey 2012). Highly masculine men are judged as having lower romantic attachment, less interest in long-term relationships, and report engaging more often in short-term relationships (Rhodes et al. 2005; Kruger 2006). However, women’s preferences for masculine physique, facial shape, scents, and vocal pitch change with fertility, shifting toward exaggerated masculinity when the likelihood of conception is higher (Gangestad and Thornhill 2008). We found that women with higher potential fertility ascribed their highest attractiveness ratings to heavy stubble, whereas women with lower potential fertility and those using contraceptives rated clean-shaven faces as most attractive. However, differences in ratings between clean-shaven, light stubble, and heavy stubble were not statistically significant, and the main effects were driven by the significantly lower ratings given to full beards compared with all other degrees of facial hair. Thus, our findings do not support hypotheses that women’s preferences for masculinity, in this case beardedness, are greater when fertility is higher.

Estimating fertility based on participants recollecting the days since the onset of menstrual bleeding was a limitation in our study, as participants may inaccurately recall the details of their menstrual cycles (Small et al. 2007; Jukic et al. 2008) and vary in the onset and duration of the period of fertility (Fehring et al. 2006; Brodin et al. 2008). Such individual variability may explain why some studies using self-reported data on the menstrual cycle have demonstrated that masculinity and symmetry in bodily and facial traits are preferred at the peri-ovulatory phase (Penton-Voak et al. 1999; Penton-Voak and Ferrett 2000; Little, Jones, and Burriss 2007; Little, Jones, Burt, et al. 2007; Little et al. 2008), whereas other studies have not (Koehler et al. 2002, 2006; Brodin et al. 2008). Such individual variability may explain why some studies using self-reported data on the menstrual cycle have demonstrated that masculinity and symmetry in bodily and facial traits are preferred at the peri-ovulatory phase (Penton-Voak et al. 1999; Penton-Voak and Ferrett 2000; Little, Jones, and Burriss 2007; Little, Jones, Burt, et al. 2007; Little et al. 2008), whereas other studies have not (Koehler et al. 2002, 2006; Brodin et al. 2008). Peters et al. (2009) measured the surge in luteinizing hormone that precedes ovulation and found no change in preferences for masculinity of men’s bodies and faces among women tested at both the high and low fertility phases. Preferences for the faces of men with higher testosterone were greater among women with higher estradiol (Roney and Simmons 2008) and among women with the highest increase in estradiol from low to high fertility phases (Roney et al. 2011). It will be important for future studies to integrate individual differences in hormone levels with direct measures of fertility to fully understand whether masculinity preferences are specific to endocrine function.

Table 3
Analysis of variance of the effects of partner’s (Analysis 5) and father’s (Analysis 6) beardedness on ratings

<table>
<thead>
<tr>
<th>Analysis 5. Partner’s beard</th>
<th>F</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anova</td>
<td>16.81</td>
<td>15</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Facial hair</td>
<td>18.52</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Partner’s beard</td>
<td>30.94</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Facial hair × partner’s beard</td>
<td>3.64</td>
<td>9</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Analysis 6. Father’s beard</th>
<th>F</th>
<th>df</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anova</td>
<td>27.11</td>
<td>15</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Facial hair</td>
<td>33.64</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Father’s beard</td>
<td>80.44</td>
<td>3</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Facial hair × father’s beard</td>
<td>0.20</td>
<td>9</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Facial hair may play a more important role within the context of relationship formation than as a visual signal that augments the attractiveness of a hypothetical partner. We found that women with partners who were clean-shaven gave the highest ratings for clean-shaven faces and women whose partners had full beards gave the highest ratings for heavy stubble and full beards. Rantala et al. (2010) also reported that women’s preferences for chest and trunk hair were positively correlated with their partner’s body hair. During our interviews, women stated strong opinions regarding the importance of facial hair in mate choice. Some women, for example, expressed strong disgust toward beards, stating that it caused irritation when they kissed their partners, whereas others stated that they preferred beards as it made a man...
look “rougher” and more “rugged.” Rantala et al. (2010) also noted during their interviews that women stated very strong personal opinions regarding the importance of body hair in a partner. That study, conducted in Finland, found a positive relationship between women’s attractiveness judgments of body hair and their fathers’ body hair. However, this effect was not replicated among Slovakian or Turkish women (Prokop, Rantala, Usak, et al. 2012). We found that irrespective of their fathers’ degree of beardedness, women rated clean-shaven, light stubble, and heavy stubble as more attractive than full beards. We did find a positive, albeit weak, correlation between partner’s beard and father’s beard, providing some support for sexual imprinting hypotheses. However, as Rantala and Marcinkowska (2011) suggest, studies among participants raised by adopted parents are required to fully test sexual imprinting hypotheses in humans.

The cultural significance of men’s beards has undoubtedly been shaped over the centuries by a constellation of societal, religious, and political values (Reynolds 1949; Peterkin 2001). Even within a relatively brief time period, the popularity of styles in facial hair can vary dramatically. For example, the frequency of mustaches, sideburns, full beards, and clean-shaven appearances among men in London from 1842 to 1971 each displayed distinct peaks in popularity (Robinson 1976). Although this may reflect arbitrary trends in tastes among men, Barber (2001) reanalyzed these data and demonstrated that men were more heavily bearded when there was an excess of males in the marriage market, suggesting that men augment cultural displays of dominance when intrasexual competition is higher. Preferences for masculine facial features depend on women’s surrounding environmental context and are most pronounced among women living in countries with the lowest standards of healthcare (DeBruine et al. 2010), greatest income inequality (Brooks et al. 2011), and highest pathogenic exposure (DeBruine et al. 2012). Women’s preferences for chest hair also varies cross-culturally (Dixson, Dixson, Li, et al. 2007; Dixson, Dixson, Morgan, et al. 2007; Dixson et al. 2010), but appear not to be influenced by exposure to stimuli depicting disease-carrying ectoparasites (Prokop, Rantala, and Fančovičová 2012; Prokop, Rantala, Usak, et al. 2012).

Nevertheless, future studies investigating the perceptions of facial hair across differing demographic and ecological settings would be valuable. For the present, our study demonstrates that beards are by no means considered unattractive by all women. However, when they are judged to be attractive patterns in preferences reflect a subtle relationship between hormonal, reproductive, and current relationship status.

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