Preferences for masculinity in male bodies change across the menstrual cycle

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Abstract

In human females cyclic shifts in preference have been documented for odour and physical and behavioral male traits. Women prefer the smell of dominant males, more masculine male faces and men behaving more dominantly when at peak fertility than at other times in their menstrual cycle. Here we examine variation in preferences for body sexual dimorphism. Across two studies, both between- and within-participant, we show that women prefer greater masculinity in male bodies at times when their fertility is likely highest, in the follicular phase of their cycle. Shifts were seen when rating for a short-term but not when rating for a long-term relationship. In line with studies showing similar effects for facial sexual dimorphism, we also show that women prefer greater masculinity when they think themselves attractive than when they think themselves less attractive. These results indicate that women's preferences for sexual dimorphism in male bodies follow a similar pattern as found for sexual dimorphism and dominance in other domains and such differences in preference may serve a similar function. Cyclic preferences could influence women to select partners when most likely to become pregnant that possess traits that may be most likely to maximize their offspring's quality via attraction to masculinity or serve to help acquire investment via attraction to femininity.
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Many studies have demonstrated that women's preferences for male traits change across the menstrual cycle. Increased preferences for facial masculinity (Frost, 1994; Johnston et al., 2001; Penton-Voak and Perrett, 2000; Penton-Voak et al., 1999), vocal masculinity (Feinberg et al., 2006; Puts, 2005), videoclips of dominant behavior (Gangestad et al., 2004) and for taller men (Pawlowski and Jasienska, 2005) that coincide with the late follicular (i.e., fertile) menstrual cycle phase have been reported. These changes in preferences for masculine men are potentially adaptive. Human males bring two factors to a parenting relationship: investment in their partners and offspring and potential heritable benefits (e.g., genes for high-quality immune systems). Masculinity in males has long been thought to be indicator of quality via classic handicap models (Folstad and Karter, 1992); as testosterone handicaps the immune system (Kanda et al., 1996) and therefore only high-quality males can afford to be masculine (Thornhill and Gangestad, 1999). The relationship between masculinity and quality is controversial and there are several lines of reason involved in why it is preferred (Getty, 2002; Thornhill and Gangestad, 1999).

While masculine faced men are healthier than their feminine faced counterparts (Rhodes et al., 2003), masculinity in a partner also carries a cost. Men with masculine faces have higher circulating testosterone levels (Penton-Voak and Chen, 2004), which are linked to marital instability and lower levels of attachment in relationships (Booth and Dabbs, 1993; Burnham et al., 2003). Thus, variation in preferences during the menstrual cycle may enable women to maximize the benefits of their mate preferences, potentially shifting priorities between heritable benefits to offspring and investment (Penton-Voak et al., 1999).

Although peaks in sexual desire and activity have been reported at different stages across the menstrual cycle (Regan, 1996), studies have reported that women with partners may be more likely to engage in extra-pair sex at peak fertility. Extra-pair copulation is 2.5 times more likely during the follicular

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phase than in the luteal phase (Baker and Bellis, 1995). Further evidence for possible extra-pair behavior comes from studies showing that women at peak fertility are more likely to have sexual fantasies about men other than their primary partner (Gangestad et al., 2002), express a greater interest in attending social gatherings where they might meet men at peak fertility (Haselton and Gangestad, 2006) and to report being more committed to their partners during the luteal phase of the menstrual cycle and less committed in the late follicular phase (Jones et al., 2005). These studies suggest a possible mechanism whereby women may maximize their chances of becoming pregnant with the offspring of males chosen for extra-pair affairs. Such males may be selected for possessing superior or alternative genes to the woman's current partner.

As an alternative, or perhaps complementary, explanation for shifting preferences, findings demonstrating the role of changes in progesterone level for increased commitment to partners and increased preferences for both feminine faced men and women during the luteal phase of the menstrual cycle may increase the care and support that is available during hormonal profiles similar to those that characterize pregnancy (Jones et al., 2005). In this way, rather than acquiring direct benefits for offspring from masculine men, women instead maximize investment from feminine men (Jones et al., 2005).

Preferences for masculinity in faces have also been found to be moderated by other factors relating to potentially strategic choice. Condition-dependent mate choice is seen in female fish species (Bakker et al., 1999) and humans (Little et al., 2001; Penton-Voak et al., 2003). Attractive women, possibly due to their increased competitiveness for mates, are more discriminating than less attractive women, displaying greater preferences for masculinity in faces (Little et al., 2001; Penton-Voak et al., 2003). For short-term relationships, women are more likely to choose an attractive male who is less cooperative and appears to have poorer parenting qualities over a less attractive male who is more cooperative and with better parenting qualities (Scheib, 2001). By contrast, for long-term contexts women may choose the less attractive but more cooperative man more often (Scheib, 2001). In face preference tasks, women judging for short-term relationships prefer more masculinity in faces than those judging for long-term relationships (Little et al., 2002). Women also prefer to select taller partners for short-term than for long-term relationships (Pawlowski and Jasienska, 2005). It is possible that some women may choose a long-term partner whose feminine appearance suggests cooperation and extended paternal care and/or choose short-term partners whose higher facial masculinity may indicate better genetic quality (Little et al., 2002; Perrett et al., 1998). Already having a partner has also been shown to predict female face preferences. An increased preference for genetic fitness over signs of parental investment would be expected in extra-pair copulations when a woman has already acquired a long-term partner. Indeed, Little et al. (2002) have shown that women who have partners prefer masculinity in faces more than those without a partner.

Given the many effects of menstrual cycle on masculinity preferences, the current study examined preferences for sexual dimorphism in body shape across the cycle. Preferences for

male body shape have generally used line drawings which have manipulated specific aspects of shape. Such studies have revealed preferences for broad shoulders (Dixson et al., 2003), taller men, particularly at high fertility (Pawlowski and Jasienska, 2005), masculine (low) waist to chest ratios, broad shoulders relative to small waist (Maisey et al., 1999) and masculine (high) waist to hip ratios (WHR) (Dixson et al., 2003; Singh, 1995). WHR is sexually dimorphic, with women tending towards a lower ratio during their fertile years that typifies the hourglass figure. Men tend to have more similar waist and hip measurements, resulting in a less curvy appearance. This occurs because testosterone stimulates fat deposits in the abdominal region while inhibiting fat deposits in the buttocks and thighs (Rebuffescrive, 1987). The current study uses realistic male images manipulated with computer graphic techniques for global sexual dimorphism using methods adapted from those used in many studies of preferences for masculinity in faces (Little et al., 2001; Little and Hancock, 2002; Little et al., 2002; Penton-Voak et al., 1999; Perrett et al., 1998). By using the difference between male and female bodies, the resulting images differ in the average way that men differ from women in shape and encompass general aspects of masculine shape (controlling for height differences). The current study focused on whether preferences for sexual dimorphism in shape change across the menstrual cycle following studies demonstrating that preferences for masculinity in face shape and height also change. We also examine other variables known to influence preferences for masculinity in faces: temporal context (short vs. long term), partnership status and condition-dependent preferences. For condition-dependent preferences we used self-perceived attractiveness as a proxy for mate-value/condition following previous studies (Little et al., 2001).

We predicted, following similar results for preferences for masculinity in male faces, that women would prefer more masculine male bodies when in the follicular phase of their cycle and that preferences for masculinity would be enhanced for short-term relationships. We also predicted that menstrual cycle shifts may be greater for short-term relationships, again following findings from face preferences. In Study 1 where we examined self-perceived attractiveness we expected that women viewing themselves as more attractive would have enhanced preferences for masculinity. We also included a separate analysis of women who reported using hormonal contraception. These participants represent a control group and were not expected to show menstrual cycle shifts in preference.

Methods

Study 1

Participants

Ninety-seven female participants (aged 17–35, mean age=24.9, SD=5.5) took part in the study. The study was administered over the internet via a link from www.alittlelab.com and participants were volunteers selected for reporting to be heterosexual, not using oral or other hormonal contraception, being between 17 and 35 years of age, not being pregnant and having a restricted range in their reported cycle date (days since menstruating reported as 0–28, 61 were classified low fertile and 36 high fertile, see classification below). Sixty-one women (aged 17–35, mean age=24.9, SD=5.4) who reported using hormonal