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Facial Masculinity: Traits Conferring Direct Benefit to Offspring

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Synonyms

Male facial secondary sex traits

Definition

Sexual dimorphism of the male face that emerges at reproductive maturity and influences success in mating competition.

Introduction

Masculinity refers to male-typicality in sexually differentiated traits. Humans exhibit sexual dimorphisms throughout the phenotype (Dixson, 2009; Frayer & Wolpoff, 1985), including in the face, with men featuring wider cheekbones and mandibles, a broader chin, more prominent brow ridges, a longer lower face, and thinner lips (Claes et al., 2012; Samal et al., 2007). Facial masculinity in modern humans may reflect past selection given the advantage of craniofacial robusticity in male-male combat (Carrier & Morgan, 2015; Puts et al., 2023; Puts, 2010), as well as the salience of vision in human communication and mating competition (Scheller et al., 2021).

Masculine male faces feature secondary sex traits, phenotypes putatively produced by sexual selection, the evolutionary process favoring traits that increase their bearers' ability to win mating opportunities (Darwin, 1871). Sexual selection has shaped traits across animal species (Andersson, 1994), including humans (Dixson, 2009; Puts, 2010, 2016; Puts et al., 2012), and tends to act more strongly on males than on females in light of males' smaller parental investment (Trivers, 1972), faster reproductive rate (Clutton-Brock & Vincent, 1991), and greater reproductive variance (Bateman, 1948).

Secondary sex traits of the face exhibit the hallmark of sexual selection (Hill et al., 2017): Dimorphism that emerges at reproductive maturity and covaries with success in mating and reproduction. Facial masculinity typically develops in males around age 13 (Enlow, 1990), driven by a surge in the androgenic hormone testosterone (Verdonck et al., 1999), and continues into early adulthood, leading to lateral growth in the mandible, chin, and cheekbones, increased protrusion of the brow ridge and central face, and lengthening of the lower face. Pubertal females, by contrast, produce less testosterone and more estrogen, the latter underlying development of female secondary sex traits (Thornhill & Grammer, 1999). As a result, facial growth slows

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by about age 13 and ceases by about 15 in females, who thus retain more neotenous traits (Bulygina et al., 2006).

Facial Masculinity as Honest Signal

Facial masculinity in men may be the product partly of mate choice, a mechanism of intersexual selection favoring anatomical ornaments for attracting females (Jones et al., 2008; Little et al., 2011b; Thornhill & Gangestad, 1999). Because production of testosterone necessitates diversion of energy from, and thus impaired functioning of, the immune system (Foo et al., 2017), facial masculinity may reflect immunocompetence, thereby providing an honest signal of male genetic quality, with males able to display exaggerated facial sexual dimorphism, despite associated costs, signaling heritable pathogen resistance (Folstad & Karter, 1992; Zahavi, 1975). As offspring inheriting the underlying alleles would accrue a fitness advantage, sexual selection via mate choice may have favored a female preference for facial masculinity in males (Thornhill & Gangestad, 1999). Accordingly, some studies report that sexual dimorphism in men is positively related to health and pathogen resistance (e.g., Foo et al., 2020), though evidence for the immunosuppressive effects of testosterone is equivocal (e.g., Scott et al., 2012), with relationships potentially moderated by environmental context (e.g., food availability and extrinsic mortality risk; Nowak et al., 2018). When tested empirically, the prediction that women will prefer men with greater facial dimorphism has received support (e.g., Johnston et al., 2001), though some studies have found women to prefer in certain contexts male-appearing faces more feminine than the male mean (e.g., Borras-Guevara et al., 2017; Penton-Voak et al., 1999; Perrett et al., 1998).

Direct and Indirect Benefits

While a masculine male face may convey genetic quality, it has also been associated with unattractive behavioral traits, such as infidelity, dishonesty, and decreased parental investment (Perrett et al., 1998), and may therefore dictate a trade-off between benefits conferred directly to mates (i.e., investment) and those conferred directly to offspring (i.e., immunocompetence), the latter benefiting the mother only indirectly, through the increased fitness of her offspring. Evaluation of such trade-offs may depend on ecological and socioeconomic context, as the salience of certain environmental stressors may determine the relative cost and benefit of a masculine mate (Little et al., 2013). For example, in environments where offspring are at greater risk of infectious disease, women may be more inclined to recruit the heritable pathogen resistance putatively associated with facial masculinity (Little et al., 2011a) and place less importance on investment. Therefore, women's preferences for facial masculinity may constitute an adaptive mate choice strategy, responding facultatively to environmental and social context to manage the trade-offs (i.e., genetic quality vs paternal investment) associated with masculine traits, including those of the face (Little et al., 2011b). Such trade-offs may explain women's greater preference for masculinity in short-term than in long-term relationships, as short-term mates are chosen largely for heritable fitness benefits, whereas long-term mates are chosen more for their ability and willingness to invest in offspring (Little et al., 2002).

Some research has found women's preferences for masculinity to covary with hormonal changes across the ovarian cycle, an effect moderated by temporal relationship context (e.g., Penton-Voak et al., 1999). Such observations are consistent with the hypothesis of a stronger female preference for masculinity around ovulation, when conception risk permits recruitment of genetic benefits, than during the luteal phase, when female physiology prepares for pregnancy, prioritizing investment in future over current offspring (Thornhill & Gangestad, 1999). While the observed shift has been interpreted as an adaptive female mate choice strategy (Jones et al., 2008), supporting studies have featured small samples, unreliable measures of conception risk, and between-subjects designs, which cannot parse the effects of hormonal influence (Jones et al., 2018). In addition, methodologically more rigorous research has not supported the ovulatory shift hypothesis (Jones et al., 2018), a finding true of women's preferences for masculinity in other trait spaces, such as the voice (Jünger et al., 2018), and meta-analyses of ovulatory shift data have produced conflicting results (Gildersleeve et al., 2014; Wood et al., 2014). This suggests the need for continued research and consideration of alternatives to immunocompetence accounts of masculinity preferences.

Women's preferences for male facial masculinity are heritable, with genetic differences estimated to explain 38% of trait variation, contextual factors (e.g., conception risk, pathogen disgust) less than 1% (Zietsch et al. 2015). Moreover, investigations of the moderating effects of ecological and economic variables report either no correlation between women's facial masculinity preferences and environmental context (e.g., Tybur et al., 2022) or an inverse correlation (e.g., Borras-Guevara et al., 2017), which contests prevailing theory.

Alternative Mechanisms

While much research has emphasized the role of female choice in the evolution of male facial dimorphisms, these may also have arisen via contest competition (Puts, 2010; Scott et al., 2012), a mechanism of intrasexual selection favoring anatomical armaments such as size, strength, and weaponry, which allow their bearers to exclude same-sex rivals from mating opportunities by force or threat of force. Facial masculinity is associated with physical formidability and dominance perception (Hill et al., 2013), as well as a decreased likelihood of catastrophic fractures of the skull and mandible (Carrier & Morgan, 2015; Puts et al., 2023; Puts, 2010), and may therefore have resulted in greater mating success by allowing men to elicit deference from same-sex rivals (von Rueden et al., 2011). For example, facial masculinity predicts upper-body strength (Fink et al., 2007), perceptions of physical formidability (Sell et al., 2009), and deference from men who perceive themselves as less masculine (Watkins et al., 2010). That facial sexual dimorphism is, and is perceived to be, a reliable indicator of formidability in men, is consistent with a role for contest competition in shaping male facial masculinity (Puts et al., 2012), as is the greater robusticity of men's skulls given the preferential targeting of the face in male-male violence (Brink et al., 1998; Carrier & Morgan, 2015; Puts et al., 2023; Puts, 2010). Such findings, along with equivocal support for immunocompetence accounts of women's masculinity preferences (e.g., Scott et al., 2012), suggest the salience of contest competition in the evolution of male facial masculinity and are consistent with cumulating evidence that sexually dimorphic traits throughout the male phenotype may have evolved primarily as armaments rather than ornaments (e.g., Hill et al., 2013, 2017; Puts, 2010, 2016; Puts et al., 2012, 2023).

Conclusion

Sexual selection has likely shaped the morphology of the human face such that men exhibit sexually dimorphic facial traits, though the adaptive significance of this dimorphism remains unclear. Further research, whether to address methodological limitations within existing frameworks or examine yet-unconsidered hypotheses, is warranted.

Cross-References

- ► Facial Characteristics: Mate Preferences
- ► Facial Masculinity
- ► Female Choice: Handicap Hypothesis
- ► Immunocompetence: Facial Masculinity
- ► Short-Term Mating: Facial Characteristics
- ► Strategic Pluralism Theory

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