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Individual differences in women's facial preferences as a function of digit ratio and mental rotation ability

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Abstract

The second-to-fourth digit ratio (2D:4D) and mental rotation (MR) ability are sexually dimorphic traits that appear early in development and have been correlated with exposure to prenatal androgens (Grimshaw, Sitarenios, & Finegan, 1995; Lutchmaya, Baron-Cohen, Raggatt, Knickmeyer, & Manning, 2004). The current study examined how 2D:4D and MR differences among women of European descent ($N = 41$) were related to their (a) preferences for male faces: attractive (ATM), short-term (STM), and long-term mate (LTM), and (b) psychological femininity and masculinity, as measured by the Bem Sex-Role Inventory (BSRI) (Bem, 1981). To examine potential changes in facial preferences over their menstrual cycle, participants' preferences were measured during two experimental sessions separated by 2 weeks. The results indicated that (a) femininity scores decreased with decreasing 2D:4D, (b) masculinity scores increased with faster MR, (c) women preferred a more masculine male face for an STM than for an LTM, and (d) preference changes over the menstrual cycle varied systematically with 2D:4D. When compared with women with high 2D:4D ratios, low 2D:4D women (e) preferred a more masculine LTM, (f) recalled less parental bonding, (g) had shorter intimate relationships, and (h) reported more menstrual irregularity. The results are interpreted as support for an interactive hormonal theory of physical attraction.
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1. Introduction

The standard model of sexual differentiation of the mammalian body and brain maintains that the "default" sex is female, and maleness is a consequence of early androgen exposure that both defeminizes and masculinizes the developing embryo (Jost, 1972; Woodson & Gorski, 2000). The human literature examining the effects of androgen insensitivity (Masica, Money, & Ehrhardt, 1971; Wisniewski et al., 2000), congenital adrenal hyperplasia (Hampson, Rovet, & Altmann, 1998; Hines, 2000; Resnick, Berenbaum, Gottesman, & Bouchard, 1986), idiopathic hypogonadotropic hypogonadism (Hier & Crowley, 1982), and Turner's syndrome (Collaer, Geffner, Kaufman, Buckingham, & Hines, 2002; Hines, 2000) are all consistent with this model. In nonhuman mammals, this androgen-dependent sex reversal is accompanied by a change in sexual preferences (Gorski, Harlan, Jacobson, Shryne, & Southam, 1980; Phoenix, Goy, Gerall, & Young, 1959). That is, the "default" sex (female) is normally attracted to males in adulthood but following early exposure to androgens, the vast majority of the resulting sex (male) is now attracted to females. This reversal in preference may be a consequence of a change in sensitivity to the cues to which each sex is attracted. If early androgens influence human sex preferences, then the degree of early androgen exposure within women and within men may influence both their psychological femininity/masculinity scores and the degree to which they are attracted to sexually selected characteristics displayed on the faces and bodies of the opposite sex. That is, individual differences in preferences for the opposite sex may be attributable, at least in part, to the degree to which the different individuals' brains were defeminized/masculinized by the organizational effects of early androgens. The current study evaluates this proposition by examining how the ratio of second-to-fourth digit (2D:4D) and mental rotation (MR) ability, potential indices of early androgen exposure, are related to a woman's preferences for male faces and her femininity/masculinity scores on the Bem Sex-Role Inventory (BSRI; Bem, 1981). Differences in facial preferences as a function of menstrual phase and parental bonding questionnaire scores are also examined.

1.1. The ratio of second-to-fourth digit (2D:4D)

The 2D:4D is a sexually dimorphic trait that has been known for over 100 years (Baker, 1888), with men, on average, having lower 2D:4Ds than women do. Unlike sexually dimorphic characteristics that appear at puberty, 2D:4D is established by the 13th week after conception (Garn, Burdi, Babler, & Stinson, 1975). Based on a large number of studies, Manning (2002) has concluded that 2D:4D is positively associated with prenatal estrogen and negatively associated with prenatal testosterone. There is also evidence for population differences in 2D:4D that are significantly larger than the between-sex differences within any population (Manning et al., 2000). To avoid the possible confounding effects of population differences, the current study examines the relationship between 2D:4D and mate choices in a group of women of European (Anglo) descent.