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# Does age difference really matter? Facial markers of biological quality and age difference between husband and wife

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ABSTRACT

Information conveyed by facial attractiveness markers such as averageness, bilateral symmetry, and secondary sexual characteristics may play an important adaptive role in human sexual selection. Nonetheless, mate choice also relies on other non-physical characteristics such as, for instance, an individual's age. Women prefer and enter in relationships with older partners, whereas in men the inverse relation is observed. Surprisingly, the link between facial morphological markers of biological quality on the one hand and age disparity between partners on the other hand has been as yet subject of very little research. This study aims to fill this gap. We had used facial photographs and demographic data of heterosexual marriages. Facial cues of biological quality, such as averageness, bilateral symmetry, and sexual dimorphism, were digitally measured using geometric morphometric methods and then associated with spouses' age difference. It turned out that a greater age disparity between spouses correlates, in both partners, with higher scores in facial measures which indicate partners' biological quality. One exception is female facial masculinity – generally regarded as an unattractive marker of a low biological quality – which, too, is associated with higher spouse age disparity. In general, our results show that facial symmetry, averageness, and secondary sexual characteristics may play a role in age-dependent mate choice. We suggest

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that in marriages where the wife is considerably younger than the husband, wife's greater facial masculinity may increase her perceived age and with it, her perceived maturity.


## Introduction

Bilateral symmetry, averageness, and secondary sexual characteristics are the subject of numerous studies of human facial attractiveness (Fink and Neave, 2005; Fink and Penton-Voak, 2002; Little et al., 2011; Rhodes, 2006; Thornhill and Gangestad, 1999). In mate choice, they are seen as markers of several aspects of biological quality of a potential partner. More specifically, it is believed that a high level of facial symmetry, or more precisely the absence of fluctuating asymmetry (FA; definitions: Møller and Swaddle, 1997; Valen, 1962), reflects developmental stability, that is, an individual's ability to resist adverse genetic and environmental pressures during ontogeny (e.g. Özener, 2010; Thornhill and Gangestad, 1999; Thornhill and Møller, 1997). Some empirical studies support this view: higher levels of facial asymmetry have been related to somatic and mental disorders (Thornhill and Møller, 1997), lower intelligence (weak association revealed by Pound et al., 2014), lower ratings of apparent health (Jones et al., 2001), and a greater susceptibility to respiratory diseases (Thornhill and Gangestad, 2006). Other studies do not support these conclusions: Pound et al. (2014), for example, challenge the idea that there is a relation between low facial asymmetry and good health, and Van Dongen and Gangestad (2011) used meta-analysis to show that facial asymmetry is rather a weak indicator of developmental instability, though the average effect size ($r = 0.2$) is not negligible, especially within evolutionary context (Møller and Jennions, 2002).

Similarly, facial morphological averageness has been described as a marker of phenotypic and genotypic quality (Little et al., 2011; Rhodes, 2006; Thornhill and Gangestad, 1999). In fact, both theoretical and empirical studies suggest that average faces indicate an individual's heterozygosity and greater genetic diversity, which can be correlated with increased immunocompetence and disease resistance (Gangestad and Buss, 1993; Grammer and Thornhill, 1994; Lie et al., 2008; Thornhill and Gangestad, 1993). It has been demonstrated that a digitally manipulated level of facial averageness is positively related to perceived health in both men and women (Rhodes et al., 2001), while facial averageness in late adolescence is associated with health status determined on the basis of medical records in childhood for males and with current medical health for females (Rhodes et al., 2001).

The informative value of secondary sexual characteristics in faces is linked to two issues. First of all, since sexual dimorphism develops mainly during puberty (e.g. Tanner, 1989), dimorphic male (i.e. masculine) and female (i.e. feminine) facial traits are visible signals of an individual's sexual maturity. The second issue has to do with the handicap principle (Zahavi, 1975, 1977) and the immunocompetence handicap hypothesis (Folstad and Karter, 1992; Wedekind and Folstad, 1994). In particular, the development of sexual ornaments is linked to the biological costs an individual thereby incurs. These costs take the form of energy expenditure related to the growth and maintenance of sexually dimorphic traits but also the specific double-edged nature of sex hormones, since the hormones which drive the development of secondary sexual traits also handicap the immune system. The overall costs of conspicuous sexual ornaments therefore hinder their development in low-quality individuals (Folstad and Karter, 1992; Wedekind and Folstad, 1994; Zahavi, 1975, 1977). Yet while some authors (Scott et al., 2013) argue that at least in men, the significance of a link between facial sexual dimorphism and immunocompetence may have been overstated, several studies confirm that sexual hormones which facilitate the development of facial masculinisation in men and feminisation in women can be immunosuppressive in humans (e.g. testosterone: Kanda et al., 1996; Yesilova et al., 2000 and, at least to some extent, oestrogens: Giannoni et al., 2011; Jansson and Holmdahl, 1998; Salem, 2004). Moreover, it has also been shown that men's masculinity and women's femininity correlate negatively with susceptibility to respiratory diseases (Thornhill and Gangestad, 2006), perceived masculinity is positively associated with adolescent male health (Rhodes et al., 2003), and female face preferences positively correlate with male immunocompetence (Rantala et al., 2012).