

Father–daughter relationship as a moderator of sexual imprinting: a facialmetric study

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Initial receipt 3 July 2006; final revision received 2 February 2007

Abstract

This study investigated sexual imprinting in human females. Facial proportions of fathers were compared to the proportions of stimulus faces the participants found attractive. Women who rated their childhood relationships with their father highly showed a significantly stronger relationship between the proportions of their father's face and their chosen stimulus than other women, primarily concerning the central face area. Women who rated their fathers less highly did not show similarity between fathers' and stimulus' faces. This supports previous research using photographs of parents' and spouses' faces.

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Keywords: Facial attraction; Imprinting; Father–daughter relationship; Facial measurements; Mate preferences

1. Introduction

Sexual imprinting, which is the sexual preference for individuals possessing parental characteristics, has been a subject of study in nonhuman vertebrates for many years (see, e.g., Pfaus, Kippin, & Centeno, 2001, for a review). More recently, there has also been research showing evidence for sexual imprinting in humans. Several papers have suggested that opposite-sex parental phenotypes may be reflected in the idealised and actual mate choices made by both men and women (e.g., race: Jedlicka, 1980; parental age: Perrett et al, 2002; Wilson & Barrett, 1987; colouring: Little, Penton-Voak, Burt, & Perrett, 2003). So long as mechanisms exist to prevent inbreeding depression (e.g., the Westermarck effect, see Lieberman, Tooby, & Cosmides, 2003), it has long been considered that it may be adaptive to mate with those who bear some resemblance to ourselves and/or our family as this increases relatedness between parents and offspring and may preserve co-adapted gene complexes (see, e.g., Bateson, 1978, for a discussion of optimal outbreeding). More recently, it has been suggested

that imprinting may serve to increase genetic compatibility between mates (Tregenza & Wedell, 2000) or to assist offspring in successfully finding a mate (by using their successfully mated parents as models; Todd & Miller, 1993). Alternatively, imprinting may be the result of learning, without any adaptive function. For instance, it may be that one side effect of developmental plasticity in the face processing regions of the brain is to bias beliefs about what makes a desirable face towards those faces seen most often in early development [i.e., the parents'; see, e.g., Perrett et al, 2002, for discussion; although Todd & Miller, 1993, claim, based on their modelling research, that imprinting is indeed adaptive].

Berezkei et al. found further evidence to suggest that sexual imprinting in humans is not a passive process, but rather is moderated by the quality of the parent–child relationship in both males (Berezkei, Gyuris, Koves, & Bernath, 2002) and females (Berezkei, Gyuris, & Weisfeld, 2004). This may be adaptive because a partner who bears resemblance to a distant parent may be less likely to be a good parent himself/herself. There may also be an element of straightforward conditioning, with children who did not have good relationships with their parents developing an aversion to parental features and vice versa. Berezkei et al. (2002) found that the resemblance between men's wives and

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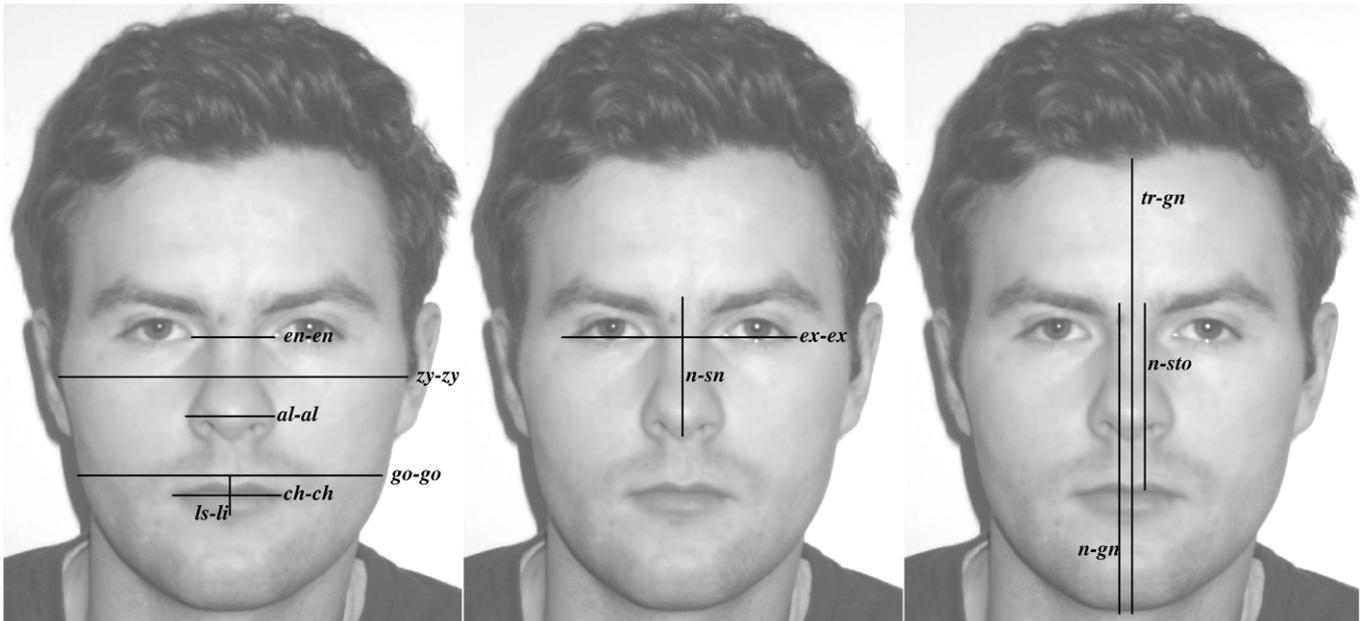


Fig. 1. Measurements taken of fathers' and stimulus faces.

their mothers was stronger if the men had had positive relationships with their mothers. Similarly, [Bereczkei et al. \(2004\)](#) found that the degree to which women's adoptive fathers bore resemblance to their husbands was significantly related to how well the women got on with their adoptive fathers. Importantly, this effect cannot be genetically mediated as the women were all adopted and, furthermore, cannot be influenced by any similarity between the daughters and adoptive fathers (perhaps brought about through environmental factors) because self-husband similarity was much weaker than father-husband similarity. It is possible, however, that those participants in the research of [Bereczkei et al.](#) who were judging resemblance between parents and spouses (by attempting to match the correct spouse, out of a group of 4, to the parent) used cues such as clothes, head position, and expression to match the in-laws, rather than any physiognomic features.

The aim of this study therefore was to investigate evidence of parental imprinting in women using facialmetric data. Doing so allows a clear view of how fathers' facial features relate directly to the features of faces their daughters find attractive.

2. Methods

2.1. Participants

Eighty-one women and their fathers were recruited from the community in and around Wrocław, Poland. Five women were excluded because they only lived with their stepfather, while 7 were excluded because they failed to fully complete the study, leaving 69 women. To avoid pseudoreplication, where more than one sister volunteered for the study, only the

eldest daughters were included, leaving a final sample of 49 women aged 15 to 34 (mean, 24.3 ± 5.2).

2.2. Data collection: faces

2.2.1. Stimuli

Facial photographs were taken of 31 men. Of these, 6 were excluded because they had beards, while 9 were excluded because they were all very close to average in their facial proportions (*all* facial measurements were within 1 S.D. of the mean; see below). The remaining 16 faces were shown to 20 raters (10 male, aged 19–25 years) who assessed them for similarity. Only two faces were judged to be very similar (19/20 judges agreed) and so one of these two faces was removed at random. This left 15 stimuli representing a wide range of distinct faces that were used in this study. All facial stimuli were masked, such that ears, hair, and neck/shoulders were not visible.

2.2.2. Facial measurements

All stimuli and the faces of participants' fathers were measured on 11 cephalofacial dimensions by a trained anthropologist (AW) using callipers, from which 15 key proportions were calculated based on comparing each feature dimension to the height or width of the face (see [Fig. 1](#) for dimensions measured, and [Table 1](#) for all proportions; dimensions chosen based on [Farkas, 1981](#)).

2.2.3. Factor analysis

Facial proportions of all faces (all fathers and all 15 facial stimuli) were entered into a principal components analysis using SPSS 12.0 (correlations less than 0.4 and eigenvalues below 1 were suppressed and varimax rotation was used). Four significant factors emerged, as shown in [Table 1](#). Factor 1

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