Intelligence 44 (2014) 19–25

Contents lists available at ScienceDirect

Intelligence

Individual differences in preferences for cues to intelligence in the face

F.R. Moore [a,*], M.J. Law Smith [b], D.I. Perrett [c]

[a] School of Psychology, University of Dundee, UK
[b] Department of Psychology, University of Limerick, Ireland
[c] School of Psychology, University of St Andrews, UK

ARTICLE INFO

Article history:
Received 14 September 2013
Received in revised form 10 January 2014
Accepted 3 February 2014
Available online 3 March 2014

Keywords:
Fitness-indicator
Intelligence
Face
Attractiveness
Individual-differences

ABSTRACT

We tested for individual differences in women's preferences for cues to intelligence in male faces in accordance with hormonal status (i.e. menstrual cycle phase and use of hormonal contraceptives), relationship status and context, and self-rated intelligence. There were no effects of hormonal or relationship status (Studies 1 and 2) on preferences. There was, however, a positive relationship between self-rated intelligence and preferences for cues to intelligence in the face in the context of a long-term relationship, suggesting context-specific assortment (Study 3). In Study 4, self-rated partner intelligence correlated with preferences for facial cues to intelligence. We discuss these results in the context of intelligence as a fitness indicator and suggest that future research must control for assortative mating for cognitive traits in order to better understand intelligence in mate choice.

1. Introduction

Intelligence is an important consideration in human mate choice decisions (e.g. Buss, 1989; Lee & Zietsch, 2011; Li et al., 2002; Moore, Filipou, & Perrett, 2011; Prokosch, Coss, Scheib, & Blozis, 2009; Zebrowitz, Hall, Murphy, & Rhodes, 2002). Miller (2000a,b) argues that the high heritability of general intelligence (g) (Plomin & Spinath, 2004) implicates evolution through sexual (rather than natural) selection, and points to close associations between scores on g-loaded tests and various proxies of fitness such as health and developmental stability (e.g. Arden, Gottfredson, & Miller, 2008; Arden, Gottfredson, Miller, & Pierce, 2009; Banks, Batchelor, & McDaniel, 2010; Furlow, Armijo-Prewitt, Gangestad, & Thornhill, 1997; Gottfredson & Deary, 2004; Miller & Penke, 2007; Prokosch, Yeo, & Miller, 2005). That intelligence is the product of variation across the genome (e.g. Plomin & Kovas, 2005), and is inversely related to mutation load (e.g. Yeo, Gangestad, Liu, Calhou, & Hutchison, 2011), lends strong support to a role of intelligence in signaling fitness to potential partners (Miller, 2003). Such 'fitness indicator' traits signal mutation load and maintain additive genetic variance in sexually selected traits via condition-dependent expression (Houle, 2000; Houle & Kondrashov, 2002; Rowe & Houle, 1996; Tomkins, Radwan, Kotiaho, & Tregenza, 2004). Mate preferences that result in avoidance of mates with a high mutation load confer a selective advantage in terms of securing superior genetic material for offspring. Since there doesn't appear to be a sex difference in preferences for intelligent partners, it is possible that sexual selection has shaped human intelligence via mutual mate choice (Hooper & Miller, 2008).

Recently, researchers have attempted to identify context dependency in women's preferences for intelligence in a partner. Women's mate choice decisions are complex, involving context- and condition-dependent tradeoffs between, for example, cues to the willingness and ability to commit to a relationship versus cues to indirect heritable benefits (e.g. Debruine, Jones, Crawford, Welling, & Little, 2010). In

* Corresponding author at: School of Psychology, Scrymgeour Building, Park Place, University of Dundee, Dundee DD1 1HG, UK. Tel.: +44 1382 386 754.
E-mail address: f.moore@dundee.ac.uk (F.R. Moore).

http://dx.doi.org/10.1016/j.intell.2014.02.003
0160-2896/

particular, women express preferences for a committed partner in the context of long-term relationships, but switch to preferences for cues to alternative heritable qualities in the context of short-term relationships (Little, Cohen, Jones, & Belsky, 2007; Little, Jones, Penton-Voak, Burt, & Perrett, 2002) or during times of high fertility (Little et al., 2002; Penton-Voak et al., 1999; Penton-Voak & Perrett, 2000; but see Peters, Simmons, & Rhodes, 2009). Identifying when preferences for intelligence are strongest, then, can inform as to the qualities it may bestow.

While there is evidence that women's preferences for cues to men's creativity – a trait related to intelligence – increase during the fertile phase of the menstrual cycle (Haselton & Miller, 2006) and that male creative output is positively related to mating success (Nettle & Clegg, 2006), previous studies have failed to find effects of menstrual cycle phase on preferences for cues to general intelligence (e.g. Gangestad, Garver-Apgar, Simpson, & Cousins, 2007; Gangestad, Thornhill, & Garver-Apgar, 2010). Recently, for example, Prokosch et al. (2009) analysed women's preferences for men's verbal intelligence and subjective ratings of the men's intelligence and creativity based on video footage in long- and short-term relationship contexts. Subjective creativity and intelligence, and verbal intelligence scores each explained independent – albeit small – proportions of the variance in men's appeal for both long- and short-term relationships. These effects were not moderated by menstrual cycle phase, and results suggest that intelligence is equally valued in women's mate choice decisions regardless of hormonal status and relationship context.

Here we conducted a series of studies designed to test for individual differences in preferences for cues to intelligence in the face on the basis of wider measures of hormonal status (i.e. menstrual cycle phase and use of hormonal contraceptives) in a more representative sample of women than the University students used in previous studies. Furthermore, since sexual selection for intelligence in humans is likely to have evolved via mutual mate choice, resulting in positive assortment (or 'fitness matching'; Miller, 2000a,b; Hooper & Miller, 2008) we also controlled for the strong tendency for individuals to mate assortatively on the basis of intelligence (Watson et al., 2004). We used a set of facial stimuli parametrically controlled and manipulated to differ in cues to intelligence but that were matched for cues to sexual dimorphism, health and age. In Study 1 we tested the effects of menstrual cycle phase and relationship status on preferences for the facial stimuli in a sample of undergraduate female students. In Study 2 we tested for these effects, as well as effects of hormonal contraceptive use, in a sample of women from a broader age, education and socioeconomic profile. In Study 3 we tested the effects of relationship context on preferences for cues to intelligence in the face while controlling for positive assortative mating on the basis of intelligence. In Study 4 we assessed the validity of our measure of preference for cues to intelligence by comparing it with women's partner intelligence.

2. Study 1

The aim of Study 1 was to test the effects of menstrual cycle phase and relationship status on preferences for cues to intelligence in the face, using facial stimuli parametrically manipulated to differ in cues to perceived intelligence while controlling for sexual dimorphism, health and age.

2.1. Methods

2.1.1. Participants

Participants were a sub-sample (n = 34) of those described in Law Smith et al. (2006) who completed a series of face preference tests. All were Caucasian female students recruited from the University of St Andrews (UK) who reported a heterosexual orientation, and were not pregnant or using hormonal contraceptives (age: 19.67 (1.35)). Ten participants were single during the period of testing. See Table 1.

2.1.2. Materials

2.1.2.1. Stimuli creation. Stimuli were a pair of male facial composites that differed in perceived intelligence but were matched for attractiveness, age and sexual dimorphism described in Moore et al. (2011). Briefly, 166 male faces were rated by 19 participants (male: n = 8) for intelligence, health, attractiveness and sexual dimorphism (i.e. "How intelligent/healthy/attractive/masculine is this face?", with intelligence defined as "knowledgeable, analytic and rational, adaptable, independent in opinion and solves problems"). Residuals extracted from a multiple linear regression model (dependent variable: intelligence ratings; predictor variables: age, and ratings of attractiveness and sexual dimorphism) were used to identify the 5 faces that received higher ratings of intelligence than predicted by the model, and the 5 faces that received intelligence ratings lower than predicted by the model. These faces were blended together and symmetrized using Psychomorph software (Tiddeman, Burt, & Perrett, 2001) to provide a pair of faces that were matched for components of attractiveness (i.e. sexual dimorphism, health and age) but that differed in perceived intelligence (although it is important to note that the high perceived intelligence composite was rated as more attractive than the low perceived intelligence composite, despite these controls). See Fig. 1. Perceived intelligence of the face has been shown to be associated with various measures of actual intelligence (see Zebrowitz et al., 2002 for a review of meta-analyses).

2.1.2.2. Menstrual cycle phase & relationship status. Menstrual cycle phase was estimated from self-report data (number of days in a typical cycle and number of days since onset of last period of menses) using the countback method in which ovulation was estimated to occur 14 days after the onset of the most recent period of menses. All women reported regular menstrual cycles. The follicular phase (i.e. the period during which women's hormonal profile is consistent with high fertility) was estimated to occur during the week prior to ovulation, with the luteal (i.e. non-fertile) phase between ovulation (e.g. starting on day 15) and the onset of the next period of menses.

To assess effects of relationship context, we asked participants to report whether they were currently in a committed relationship (e.g. Penton-Voak et al., 1999).

2.1.2.3. Face preference tests. Participants rated the composite faces, presented individually, for attractiveness on 1 – 7 scales ("How attractive is this face?"; 1 = not at all attractive, 7 =