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Original Article

Women's reproductive success and the preference for Dark Triad in men's faces☆,☆☆,★

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ABSTRACT

Women's preference for male partners that signal either genetic or parenting advantages for their progeny is predicted to be favoured by natural selection. However, currently there are few studies on how such mate preferences are associated with women's reproductive success. We examined whether preferences for the Dark Triad personality traits (i.e., Machiavellianism, narcissism, and psychopathy) in men's faces were related to reproductive success in contemporary women. Because out of three Dark Triad features narcissism is most clearly associated with social success and physical and psychological health benefits in men, we predicted that women's preference for narcissism could be most strongly related to their reproductive success. In line with this, we found that women with preference for high narcissistic men's faces gave birth to more offspring whilst controlling for their age, sexual openness (sociosexuality) and self-rated health. Moreover, women with strong preference for Machiavellian male faces reported fewer offspring than their same-aged peers with weak preference, whereas preference for psychopathic men's faces was unrelated to women's current number of offspring. These findings suggest that in modern society, women's preference for some of the Dark Triad traits in men may be related to their reproductive success.

1. Introduction

Numerous cognitive processes facilitate searching for and then choosing a partner. Mate choice in modern humans is heavily influenced by preferences for certain facial characteristics of the potential partner (Lyons, Marcinkowska, Helle, & McGrath, 2015; Rhodes, Simmons, & Peters, 2005). In addition to cultural or social influences, such preferences may be shaped by natural selection, as faces provide information on the individual's ability to produce high quality offspring (Pisanski & Feinberg, 2013), and can reveal qualities (such as cooperativeness) that could be desirable in a long-term partnership (Tognetti, Berticat, Raymond, & Faurie, 2013). Facial characteristics have been associated with individual differences in personality (Little & Perrett, 2007), and it is possible that mate choice is guided also by personality-related information (Jonason, Lyons, & Blanchard, 2015; Moore, Smith, & Perrett, 2014; Valentine, Li, Penke, & Perrett, 2014). Both a person's facial attractiveness (Jokela, 2009) and personality characteristics like neuroticism, openness, and extraversion (Jokela, Alvergne, Pollet, & Lummaa, 2011) have been found to affect the number of offspring people have. However, it is not clear if a preference for personality characteristics in a potential mate have impact on an individual's reproductive success.

Female mate choice serves to gain both genetic and non-genetic benefits, such as parental care that maximises offspring's survival (Kokko, Brooks, Jennions, & Morley, 2003), and much research is based on the assumption that individuals prefer certain characteristics in prospective partners owing evolutionary reasons. Despite the theoretical importance of female mate choice only few studies have directly looked at how mate choices are associated with the fecundity: Bereczkei & Csanaky (1996) found that women who were married to high status men had higher number of children and Nettle and Pollet (2008) found a positive selection on male income driven by increased childlessness amongst low-income men.

It is thus possible that preference for personality traits in men that relates to dominance, resource acquisition and striving for status enables women to increase their reproductive success. Following, as narcissism, Machiavellianism, and psychopathy (the Dark Triad of personality) relate to dominance (Rauthmann & Kolar, 2013) and desire for power (Lee et al., 2013), there could be differences in reproductive success amongst women who prefer men being high or low in these traits.

The Dark Triad is a combination of traits characterised by superiority and dominance (narcissism), social charm and manipulativeness (Machiavellianism), and callousness and impulsivity (psychopathy)

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(Jonason, Li, Webster, & Schmitt, 2009; Paulhus & Williams, 2002). High Dark Triad individuals take advantage of people (McHoskey, 2001) and successfully extract and control resources (Campbell, Bush, Brunell, & Shelton, 2005; Zeigler-Hill, Southard, & Besser, 2014), which can lead to personal gain in brief social interactions and better abilities in resource acquisition. However, high Dark Triad men show lowered self-control (Jonason & Tost, 2010), risk-taking tendencies and high impulsivity (Campbell, Goodie, & Foster, 2004), all of which can constitute to lowered value on a mating market and parenting propensities.

Although socially aversive, there are several reasons for suggesting that women's preference for Dark Triad features can have evolutionary roots. First, female preference for the Dark Triad traits in men could be driven by female choice for putative genetic benefits for their offspring. For example, men high in the Dark Triad traits have good self-reported short-term mating success (Jonason et al., 2009) and women were found to prefer high Dark Triad personalities of men especially in short-term relationships (Aitken, Lyons, & Jonason, 2013; Jonason, Lyons et al., 2015). A recent study also found that narcissism is associated with increased, and Machiavellianism and psychopathy with decreased, self-reported physical and psychological health (Jonason, Baughman, Carter, & Parker, 2015). Further, narcissism has a small but significant relationship with physical attractiveness (Holtzman & Strube, 2010). These findings indicate that by preferring highly narcissist men women could secure good genes for their male offspring. Second, women who prefer high Dark Triad characters may increase their reproductive success by non-genetic means. Some aspects of the Dark Triad are related to high status in men, and partnership with high status men may be associated with increased reproductive success in women (Bereczkei & Csanaky, 1996). Again, narcissism has been branded as the most socially successful of the Dark Triad traits (Jonason, Koenig, & Tost, 2010), and may thus provide the most likely candidate for a trait that would be preferred by women owing to natural selection. Third, mating with high Dark Triad men may also have detrimental effects on fitness. Dark Triad traits are related to a fast life history strategy, implying decreased parenting effort (Jonason et al., 2009), and increased propensity towards short-term mating strategy (Lee et al., 2013). Pairing with high Dark Triad man can thus also decrease woman's reproductive success by reduced parental provisioning from her partner.

The aim of this study was to examine whether female preference for the Dark Triad facial characteristics in males is related to their reproductive success in contemporary populations. In particular, we predicted that female preference for narcissistic faces should be most closely related to their reproductive success, because of the three Dark Triad traits, this trait in men signals the highest mate value for women. Women with strong preference for narcissistic faces should thus have higher reproductive success. To our knowledge, this is the first study to examine such associations. By taking advantage of structural equation modelling (SEM), we examined how female preferences for Machiavellianism, narcissism and psychopathy in computer manipulated male faces were associated with the number of offspring women had, controlling for their age, general health (measured by self-reported health and regularity of menstrual cycles) and sexual openness.

2. Materials and methods

2.1. Experimental procedure

The study was advertised in on-line magazines, on university Web pages and via social media platforms. Participants were not compensated for the completion of the on-line survey. All responses were SSL coded. Participants provided consent for participation in this Web-based study and were asked for demographic information, including age, sexual orientation (Kinsey Scale; (Kinsey, Pomeroy, & Martin, 1948), self-rated health, regularity of the menstrual cycle (regular/not regular) and the 9-item Sociosexual Orientation Inventory (SOI-R) measuring sexual openness (Penke & Asendorpf, 2008); see Tables 1 and 2 for a correlation matrix between the variables studied and Table S1 from Electronic Supplementary Material 1 for country-specific data, available on the journal's Web site at www.ehbonline.org). Regularity of the cycle and self-reported health were used as a general estimator of health of an individual. Irregular cycles are related to possible anomalous fluctuations of hormonal levels and hence lower conception probability and worsen health (Hahn et al., 2013), which in turn is likely negatively associated with women's number of offspring.

Next, the participants were asked to pick more attractive of two faces; "high" and "low" Dark Triad morphs (see electronic supplementary materials for more details, available on the journal's Web site at www.ehbonline.org), in 15 (5 face pairs × 3 Dark Triad trait) 2-Alternative-Forced choice trials. Average "high" and "low" feature faces were taken from a previous study, where men were classified as high and low on three Dark Triad scales and then photographed (Holtzman, 2011). Average examples for three features were made as a composite of 10 men from each end of the scale (Tiddeman, Burt, & Perrett, 2001). Participants were shown all pictures twice, separately for short- and long-term mating context (block order was randomised), after being presented with a short description of the context (Little, Cohen, Jones, & Belsky, 2006) and question whether they have understood the definition of short- or long-term mating. Preference for each trait was computed as the proportion of high choices per trait (0 – only low feature choices, to 1 – only high feature choices). Participants were excluded from the study if they completed less than 50% of the preference trials (n = 9), if they were non-heterosexual (scoring 3 or higher on the Kinsey Scale, n = 72) or if they stated that the definition of long- or short-term relationships was not clear (n = 132), resulting in a final sample of 2370 participants.

2.2. Statistical methods

Structural equation modelling (SEM) with latent variables (Kaplan, 2009) was used to examine the influence of preference for Dark Triad traits on the number of offspring born to women. Preference for Dark Triad traits was modelled as latent factors by using preferences for each Dark Triad trait (Machiavellianism, narcissism and psychopathy) from both short- and long-term mating contexts as continuous indicators for these three factors. The factor loading (i.e. a correlation between the indicator and the factor) for the preference for Dark Triad traits in long-term mating context was fixed to unity to set the scale for the factor. The main advantage of latent variable approach here is the ability to include measurement error in the estimated preferences and thus to obtain less-biased coefficients on their influence on women's reproductive success (Kaplan, 2009). As there is large amount of overlap between the Dark Triad traits (Jonason et al., 2009), covariances between these factors were also freely estimated. Furthermore, participant age, self-rated health, the regularity of menstrual cycle and sociosexuality index were included in the model as predictors of the number of offspring born. Participant age was also assumed to influence self-rated

Table 1
Descriptive statistics for the variables included in this study.

	n	Median/mean	SD	min	max
Number of offspring born	1504	1	1.220	0	7
Long-term Machiavellianism	2370	0.456	0.226	0	1
Long-term narcissism	2370	0.457	0.237	0	1
Long-term psychopathy	2370	0.443	0.218	0	1
Short-term Machiavellianism	2368	0.464	0.228	0	1
Short-term narcissism	2368	0.449	0.237	0	1
Short-term psychopathy	2368	0.427	0.217	0	1
Age	2370	34.370	10.867	17	70
Health	2354	5.248	1.232	1	7
Regular cycles (yes = 0, no = 1)	2125	0.234	0.423	0	1
Sociosexuality index	2351	3.530	1.897	1	9

The location of the distribution of variables is given as a mean, but in the case of number of offspring it is given as a median.