



Dark traits: Sometimes hot, and sometimes not? Female preferences for Dark Triad faces depend on sociosexuality and contraceptive use



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ABSTRACT

Although the Dark Triad personality (i.e., Machiavellianism, narcissism, and psychopathy) has been researched widely, only few studies have investigated women's preferences for men who present high and low Dark Triad features. With an on-line two-alternative forced choice questionnaire we investigated the interaction between preferences of 1962 Finnish women for facial stimuli that differed in the intensity of the Dark Triad traits, accounting for mating context, contraceptive use, and sexual openness (sociosexuality). Among non-contraceptive-using women, unrestricted sociosexuality was positively correlated with preference for high narcissistic male faces, whereas in contraceptive-using women, sociosexuality correlated negatively with preference for high Machiavellian male faces. We suggest that i) facial cues to Dark Triad traits are detectable by women, but ii) their effect on the judgments of attractiveness may vary depending on sociosexuality and contraceptive use, and that iii) preference for narcissism follows similar variation trends as masculinity preference, depending on sociosexuality and the use of hormonal contraception.

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1. Introduction

The Dark Triad personality (i.e. Machiavellianism, narcissism and psychopathy) is a set of three conceptually distinct but empirically overlapping traits (Paulhus & Williams, 2002), sharing features such as callousness and inter-personal manipulation (Furnham, Richards, & Paulhus, 2013). The Dark Triad has been suggested to be a male-typical adaptation for pursuing a short-term mating strategy (Jonason, Li, Webster, & Schmitt, 2009). Three traits of Dark Triad are to certain extent similar to masculinity, as both are related to self-reported short-term mating success and status-seeking behaviours (Jonason et al., 2009; Peters, Simmons, & Rhodes, 2008; Semenyna & Honey, 2015). The relationship between the Dark Triad and masculinity is not entirely clear, but it appears that at least Machiavellianism and psychopathy are not directly related to masculinity. In a recent study, Lyons, Marcinkowska, Helle, and McGrath (2015) found that preference for high masculine features in male faces was not associated with a preference for psychopathy or Machiavellian faces. It appears that although men who are high on the Dark Triad or masculinity scale pursue similar

mating strategies, masculinity and the Dark Triad may be quite different to each other in terms of female choice (Lyons et al., 2015).

It has been suggested that women are attracted to the “bad boy” characteristics embodied by the Dark Triad constellation (Jonason, Webster, Schmitt, Li, & Crysel, 2012), which could be associated with both direct (e.g., resources) and indirect (e.g., offspring genetic fitness) benefits. Women may pursue flexible mating strategies; where in the short-term relationships, good genes indicators play a more important role than parental care and resource provision, which, in turn, may be more important in long-term relationships (Pillsworth & Haselton, 2006). We would expect women to prefer high Dark Triad males especially in short-term relationships for genetic benefits, as men high in these traits may be less reliable as long-term partners (Jonason et al., 2009).

Currently there is very little research on the Dark Triad and indicators of good genes. Jonason, Baughman, Carter, and Parker (2015) found in a large sample of American, Australian, and British participants that narcissism was associated with positive, and Machiavellianism and psychopathy with negative health outcomes. Mating with a healthy partner confers a number of fitness benefits, and individuals may be seeking for phenotypic indicators of health when choosing a partner (Nedelec & Beaver, 2014). Thus, we expect that narcissism, rather than psychopathy and Machiavellianism, is more desirable for women oriented towards short-term mating.

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Interestingly, although men who are high on the Dark Triad scale self-report having a large number of mating partners (e.g., Jonason et al., 2009), the evidence regarding women's choice for high Dark Triad traits is conflicting. Studies utilising dating adverts have found that women rate high Dark Triad adverts as desirable partners (Carter, Campbell, & Muncer, 2014), especially during the fertile phase of the cycle (Aitken, Lyons, & Jonason, 2013). This suggests that these traits may have evolved through female choice for manipulative short-term partners (although see also Haslam & Montrose, 2015). However, research using facial morphs rather than verbal descriptions has found that women dislike computer-manipulated high Dark Triad faces in both short and long-term relationships (Lyons et al., 2015). Women's preference for male facial characteristics is affected by individual differences, such as hormonal status (Burriss, Marcinkowska, & Lyons, 2014) and sociosexuality (SOI; Provost, Kormos, Kosakoski, & Vernon, 2006), which could play a role in the preference for Dark Triad faces as well. In the present study, we investigated how contraceptive use and sociosexuality (i.e., sexual openness) relate to female choice for high and low Dark Triad computer-manipulated facial morphs.

Mating strategy and preferences are strongly entangled with individual's propensity or willingness to enter sexual relations without emotional engagement – sociosexuality (Schmitt, 2005, see also review in Simpson, Wilson, & Winterheld, 2004). Sexually unrestricted women prefer more masculine male faces (Provost et al., 2006; Waynforth, Delwadia, & Camm, 2005). As facial masculinity is an honest signal of health (Thornhill & Gangestad, 2006, however see Scott, Clark, Boothroyd, & Penton-Voak, 2013), higher preference for masculinity of women with more pronounced short-term mating interest could be linked to enhanced sensitivity to indicators of good genes. Thus, if the Dark Triad traits (especially narcissism) are signalling genetic benefits, we would expect preference for these features to correlate positively with sexual openness, particularly when evaluating faces as short-term partners.

Aside from sociosexuality, we expected that usage of oral contraceptives would alter the preferences for different face types. Hormonal contraceptives suppress pre-ovulatory shifts towards traits that signal genetic quality (Jones et al., 2005; Penton-Voak et al., 1999). Contraceptive users show a higher preference for characteristics such as intelligence and wealth (Gangestad, Garver-Apgar, Simpson, & Cousins, 2007), and lowered preference for masculinity (Feinberg, DeBruine, Jones, & Little, 2008; Little, Burriss, Petrie, Jones, & Roberts, 2013). Usage of oral contraceptives may enhance preferences for features beneficial in long-term relationships, such as visual cues to cooperation rather than genetic quality (Alvergne & Lummaa, 2010; Moore et al., 2013). Therefore, we expected that for women who are not using hormonal contraceptives preferences for high Dark Triad traits are higher than for contraceptive-users.

In summary, in the present study we aimed to add to the existing literature by investigating the role of sociosexuality and contraceptive use in women's preference for male Dark Triad facial features. Following previous findings from masculinity preference research, we expected to find that less restricted sexuality would be related to stronger preference for high Dark Triad males, but only in short-term relationships, and only among women, who do not use hormonal contraception.

2. Materials and methods

2.1. Participants

An on-line study was advertised in a Finnish newspaper, through e-mail adverts in several universities, and on research participation websites. After excluding participants who completed less than 50% of the two alternative forced-choice (2-AFC) preference trials ($n = 9$), non-heterosexual women ($n = 72$), women who stated that provided definition of long and short-term relationships was

not clear ($n = 132$), women who were post-menopausal ($n = 217$), pregnant ($n = 217$), lactating ($n = 217$), and women who were not from Finland ($n = 438$), we were left with a sample of 1962 participants (mean age = 35.25, $SD = 10.58$, 1268 (64.6%) non-contraceptive users). Due to cross-cultural variation in female preference for masculinity (e.g., Moore et al., 2013), we only included participants residing in Finland.

2.2. Stimuli

We used six random male base pictures from a previous study (Rantala et al., 2012) to create facial morphs high and low in the Dark Triad features (Lyons et al., 2015). High and low versions of each base face were created by adding the similarity to a composite face high or low in each Dark Triad feature in Psychomorph Programme (Tiddeman, Burt, & Perrett, 2001). Composite faces (averages of many faces) were taken from “faceaurus”, created in a previous study of Holtzman (2011), <http://www.nickholtzman.com/faceaurus.htm>. Such high and low Dark Triad averages were created based on individuals who scored high or low on self-assessment Dark Triad questionnaires, and who were judged accordingly on these scales by their peers (Holtzman, 2011). We created six versions (high and low narcissistic, psychopathic and Machiavellian) of each of the six male base pictures (Fig. 1).

2.3. Procedure

Upon entering the survey, participants were asked for demographic information, including whether or not they are using hormonal contraceptives, and filled in the 9-item Sociosexual Orientation Inventory (SOI-R) (Penke & Asendorpf, 2008). Following this, participants were asked to choose between the high and low morphs in 2-AFC trials, presented in two blocks for long-term and short-term relationships in randomized order. Before each block participants read the description of short- or long-term mating context (See Little, Cohen, Jones, & Belsky, 2007), and answered a question whether the definition was clear for them. Each block consisted of 18 slides. On each slide high and low feature prototype faces were depicted side by side (six pairs for each of the Dark Triad trait) in a randomized order. Participants, via forced choice, picked a face that they found more attractive. Scores of preferences were computed by taking an average from 6 choices per feature, ranging from 0 – only low feature choices to 1 – only high feature choices.

2.4. Statistical method

Structural equation modelling (SEM) with multiple indicator variables (Green & Thompson, 2012) was used to estimate the influence of sociosexual orientation (SOI) and contraceptive use on Dark Triad traits preference simultaneously in short- and long-term mating contexts (see a priori model in Fig. 2). In order to examine whether SOI had differential influence on preference for Dark Triad traits depending on contraceptive-use, after grand-mean centering SOI, we also included their interaction into the model. Dark Triad traits were modelled as continuous outcomes. Because we included several response variables measured from the same participants and preferences from both short- and long-term mating contexts, we allowed for residual covariances among response variables (Fig. 2).

The fit of the a priori model to the observed data was examined using the chi-square test (χ^2) and the following fit-indices: the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), the comparative fit index (CFI) and the Tucker–Lewis index (TLI) (West, Taylor, & Wu, 2012). The major shortcoming of the χ^2 test is that it is an approximation and too powerful to detect trivial differences in cases of large sample size and high number of variables in the model, whereas all the fit-indices used here



Fig. 1. Example of manipulated stimuli faces high and low in three Dark triad features.

are insensitive to sample size (West et al., 2012). Because of our high sample size, we thus place more weight on the fit-indices than on the χ^2 test. After setting all the non-significant residual covariances to zero (Green & Thompson, 2012), the model ($n = 1962$; $\chi^2_{MLR} = 7.0000$, $df = 6$, $p = 0.32$; RMSEA (90% CIs) = 0.009 (0.000, 0.032), $p = 1.00$; SRMR = 0.009; CFI = 0.998; TLI = 0.991) fitted the data well.

We then continued with examining the hypothesis that none of the independent variables were related to any of the response variables by comparing the fit of the model assuming freely estimated associations to the model where these associations were fixed to zero. If statistical support for significant overall associations are found, we proceed by testing whether the regression coefficients of independent variables on Dark Triad traits can be considered equal in short- and long-term mating contexts. If found unequal we further examine for which Dark Triad traits this result holds. In addition, if statistical evidence for interactions between SOI scores and contraceptive use are found, we estimated the specific parameters separately for women using contraceptives and for those not using contraceptives. The models were estimated by robust maximum likelihood estimator (MLR) that is insensitive to non-normal data (Muthén & Muthén, 1998–2012). Comparisons of nested models (see above) were conducted using χ^2 difference tests with scaling correction factors owing to MLR estimation (Satorra & Bentler, 2001). Analyses were conducted with MPlus version 7.11 (Muthén & Muthén, 1998–2012).

3. Results

In Table 1 we report the specific associations between SOI and contraceptive use and their interaction with Dark Triad traits. The model allowing non-zero influences of SOI, contraceptive use and their interaction with Dark Triad preference in both short- and long-term mating contexts fit significantly better to the data than a model fixing all these influences to zero ($\chi^2_{MLR} = 32.90$, $df = 18$, $p < .02$).

We found no overall difference in the influence of SOI, contraceptive use and their interaction on preference for Dark Triad traits between short- and long-term contexts. A model assuming equal regression coefficients of those independent variables on Dark Triad preference in both short- and long-term contexts did not show statistically worse fit to the data than a model allowing those coefficients to vary between mating contexts ($\chi^2_{MLR} = 10.60$, $df = 9$, $p > .05$). This more constrained model also fitted well to the data ($n = 1962$; $\chi^2_{MLR} = 17.54$, $df = 15$, $p > .05$; RMSEA (90% CIs) = 0.01 (0.00, 0.02), $p = 1.00$; SRMR = 0.013; CFI = 0.10; TLI = 0.99).

For the Machiavellian male faces, there was a significant interaction between SOI and contraceptive use (Table 1). Among contraceptive users, SOI was negatively associated with preference for Machiavellianism (β [95% CI] = -0.011 [-0.018 , -0.004], $z = -2.93$, $p = 0.003$), whereas among women not using contraception SOI was not associated with preference for Machiavellianism (β [95% CI] = -0.001 [-0.006 , 0.004], $z = -0.38$, $p = 0.70$).

With respect to narcissistic male faces, we also found a significant interaction between SOI and contraceptive use (Table 1). Among contraceptive users, SOI was not associated with preference for narcissism (β [95% CI] = -0.004 [-0.011 , 0.004], $z = -0.94$, $p = 0.35$), whereas among women not using contraception SOI was positively associated with preference for narcissism (β [95% CI] = 0.008 [0.003 , 0.014], $z = 2.93$, $p = 0.003$). This indicates that among women not using contraception, sexual unrestrictiveness related to higher overall preference for high narcissistic male faces. For high psychopathic male faces, we found no association with sociosexuality, contraceptive use or their interaction (Table 1).

4. Discussion

The results of our study show that out of the three Dark Triad traits, the ratings for narcissism followed most closely our predictions. When evaluating narcissistic faces, women responded in a similar manner as has been found in masculinity research (e.g., Quist et al., 2012). Not using contraception, more sexually unrestricted women showed preference for narcissistic (but not Machiavellian or psychopathic) faces, although this did not depend on the mating context. It is possible that narcissism is the most socially successful Dark Triad trait (Jonason, Koenig, & Tost, 2010; Rauthmann & Kolar, 2013), preferred by women in the short-term (Jonason, Lyons, & Blanchard, 2015) and long-term (Haslam & Montrose, 2015) mating context. Narcissism could be the most beneficial mate choice out of three Dark Triad features in terms of obtaining both genetic benefits and resources.

We suggest that there are characteristics of the craniofacial appearance of the high narcissist morphs that the non-contraceptive women with enhanced sexual interests were sensitive to. Following Lyons et al. (2015) we have found that out of three Dark Triad features only preference for narcissism shows a similar patterns with masculinity preference. It is possible that facial cues relating to sex- and stress hormones (e.g., Moore et al., 2011) differ between the three Dark Triad traits. Perhaps high narcissistic faces show signs of morphometric characteristics associated with high testosterone (i.e., high dominance) and low cortisol (i.e., low stress). Future studies should provide morphometric analyses of these faces in order to find out how the narcissists' faces differ from psychopaths' and Machiavellian, and masculine ones.

The patterns of preference for Machiavellianism and psychopathy diverged from narcissism. Contraception-users, who were more

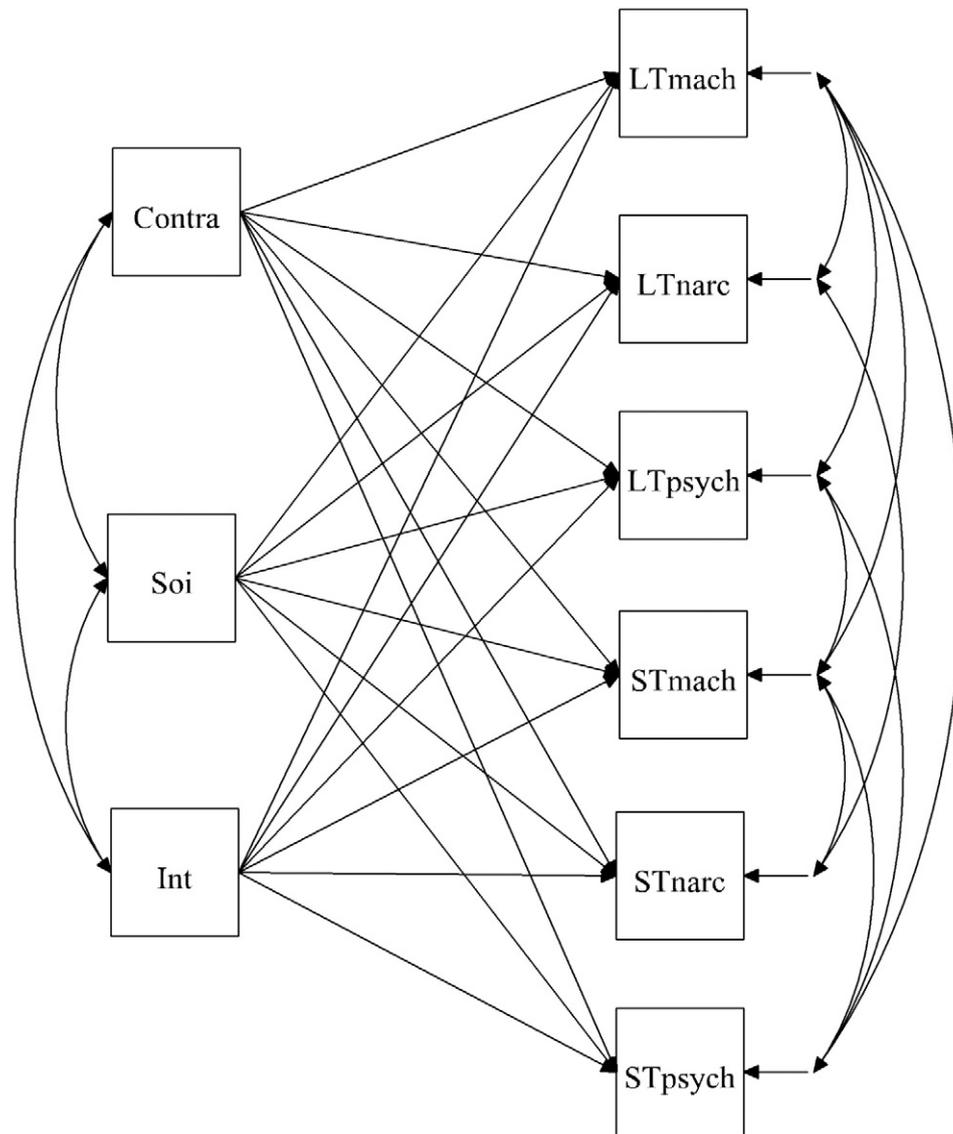


Fig. 2. The a priori model used to examine the influence of sociosexual orientation (Soi), contraceptive use (Contra) and their interaction (Int) on Machiavellianism (mach), narcissism (narc) and psychopathy (psych) in both short- and long-term mating contexts (prefix ST and LT stands for short-term and long-term context, respectively). One-headed arrows represent estimated (causal) regression (path) coefficients, whilst two-headed arrows represent the (non-causal) covariances of the residual errors of response variables.

sexually open, showed a small but significant lower overall preference for high Machiavellian faces than more sexually restricted peers. These women could be characterized by conscious desire for

Table 1

The results of a structural equation model. 95% CI = 95% confidence intervals. Please note that the parameter estimates correspond to both short- and long-term mating contexts as we found no difference between the two (see the Section 3).

	β	95% CI	z	p
<i>Machiavellianism</i>				
Contraception	0.003	−0.015, 0.020	0.29	.77
Sociosexuality	−0.011	−0.018, −0.004	−2.90	.01
Interaction	0.010	0.001, 0.019	2.11	.04
<i>Narcissism</i>				
Contraception	−0.004	−0.021, 0.014	−0.41	.69
Sociosexuality	−0.004	−0.011, 0.001	−0.97	.34
Interaction	0.012	0.003, 0.021	2.54	.01
<i>Psychopathy</i>				
Contraception	−0.007	−0.022, 0.008	−0.87	.38
Sociosexuality	−0.005	−0.011, 0.001	−1.62	.11
Interaction	0.002	−0.006, 0.009	0.39	.70

not conceiving, whilst still having a high mating drive. There may be something aversive in the high Machiavellian male faces, which could relate to high dysfunctional impulsivity (Jones & Paulhus, 2011) and lack of self-control (Jonason & Tost, 2010). These could be potentially harmful for the sexually permissive women in terms of aggression and sexual coercion (see also Townsend, Wasserman, & Rosenthal, 2015). It is possible that women who have richer sexual history have learnt through experience that high Machiavellian men make untrustworthy/aggressive partners.

Previous research has found that when viewing faces, participants showed increased amygdala activation for highly psychopathic and Machiavellian ones (Gordon & Platek, 2009), suggesting that they might be more untrustworthy than narcissistic ones. Judgement of trustworthiness might interfere differentially with preferences in long and short-term mating conditions, trustworthiness being a more desirable trait in former (Regan, Levin, Sprecher, Christopher, & Gate, 2008). As high sexual permissiveness can underlie women's general orientation towards short-term mating, unrestricted sociosexuality would then correlate with preference for less trustworthy (high Machiavellian) faces. Future studies could use the facial morphs to evaluate the perception of trustworthiness of the Dark Triad faces as long-term and short-term partners.

In summary, we found further support for the idea that narcissism is the most adaptive of the three Dark Triad traits (Jonason, Li, & Buss, 2010), and may relate to increased mating success via female choice. More studies using the Dark Triad facial morphs are needed to answer similar questions that studies on sexual dimorphism preference have investigated. Although three Dark Triad traits manifest in the facial appearance of men, it is still unclear how they differ among each other, and what their relationship to facial masculinity is. Our study could be considered as a pilot study for future research utilising the facial morphing technology.

Statement of ethical treatment of participants

This research was approved by the Liverpool Hope University, Department of Psychology IRB. Participation followed the ethical code of conduct set by the British Psychological Society.

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