

## **Are Dark Triad Cues Really Visible in Faces?**

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Thanks to Monica Koehn for helpful feedback on this manuscript.

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Word count: 1,848

**This paper is now in press at *Personality and Individual Differences***

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### Abstract

The 'dark triad' refers to the personality traits narcissism, Machiavellianism and psychopathy. Previous research found that participants could distinguish dark triad faces when judging images with average facial characteristics of people who scored either high or low on these traits. These results suggest that faces contain valid cues to dark triad personality traits and that the dark triad is a set of physical-morphological characteristics, as well as a set of psycho-social characteristics. Because putative links between personality traits and facial appearance have often not replicated well across studies, we attempted to replicate these results with a new set of face images.

Participants correctly identified the high-narcissism male and female prototypes and the high-psychopathy male prototype significantly more often than would be expected by chance. By contrast, our analyses showed no evidence that participants could discriminate between the high- and low-Machiavellianism prototypes for either sex. Surprisingly, participants correctly identified the high-psychopathy female prototype significantly *less* often than would be expected by chance alone. Together our results suggest that male and female faces contain valid cues of narcissism, but do not necessarily contain valid cues of psychopathy or Machiavellianism.

*Keywords:* dark triad; narcissism; psychopathy; Machiavellianism; face; perception.

## Introduction

The 'dark triad' refers to three overlapping, but dissociable, personality traits that are expressed sub clinically; narcissism, Machiavellianism, and psychopathy. Specifically, people who score high on narcissism seek admiration, express superiority and have a grandiose self-concept. People who score high on Machiavellianism tend to use social charm to manipulate others. People scoring high on psychopathy show a combination of impulsivity paired with low empathy. People who score high on narcissism seek admiration, express superiority and have a grandiose self-concept (Paulhus & Williams, 2002).

Dark triad scores predict a mixture of negative and positive social outcomes. For example, dark triad scores predict greater use of antisocial tactics (Muris, Merckelbach, Otgaar, & Meijer, 2017), limited self-control (Jones and Paulhus, 2011), and less cognitive and affective empathy (Jonason & Kroll, 2015). Dark triad traits are considered proximate mechanisms related to faster Life History strategies, since their scores are correlated with specific behavioral tendencies, such as unrestricted sociosexuality (Csathó & Birkás, 2018; Jonason et al., 2009; Jonason & Lavertu, 2017).

Holtzman (2011) used computer graphic methods to create composite images with the average shape and color of emotionally-neutral face images of people who scored particularly high or particularly low on narcissism, Machiavellianism, and psychopathy. People judged the composite face of people who scored high on Machiavellianism as looking more Machiavellian than the composite face of people who scored low on Machiavellianism.

People judged the composite face of people who scored high on psychopathy as looking more psychopathic than the composite face of people who scored low on psychopathy. People judged the composite face of people who scored high on narcissism as looking more narcissistic than the composite face of people who scored low on narcissism (Holtzman, 2011). These results suggest that people may be able to judge dark triad personality traits somewhat accurately (i.e., at levels greater than chance) from facial characteristics. Consequently, Holtzman (2011) proposed that the dark triad might be a set of physical-morphological characteristics, as well as a set of psycho-social characteristics.

Stimuli from Holtzman (2011) have been used in subsequent studies investigating the role of facial cues of dark triad scores in mate preferences. For example, women showed low preferences for high prototypes in both short- and long-term relationships (Lyons et al., 2015). However, the preferences for high dark triad faces seem to be modulated by ecological conditions, since women are less frequent to show aversion to Machiavellian faces when exposed to explicit prime regarding high resources availability (Lyons & Simeonov, 2016).

Putative links between personality traits and facial appearance have often not replicated well across studies (see, e.g., Kosinski, 2017). Because of this, we attempted to replicate Holtzman's (2011) results for composite face images manufactured based on each of the dark triad personality traits using a new set of stimuli.

## **Methods**

### ***Manufacturing face stimuli***

Digital face photographs of 60 young adult white women (mean age=21.7 years, SD=2.73 years) and 58 young adult white men (mean age=22.3 years, SD=3.55 years) were taken under standardized lighting conditions and with a constant background. Camera-to-head distance was held constant and participants posed with a neutral expression and looking straight at the camera. Participants removed facial jewelry and makeup prior to being photographed.

Each individual photographed completed Jonason and Webster's (2010) "Dirty Dozen" concise dark triad questionnaire. This 12-item questionnaire has three 4-item subscales measuring Machiavellianism (e.g. "I tend to manipulate others to get my way"), psychopathy (e.g., "I tend to lack remorse"), and narcissism (e.g., "I tend to want others to admire me"). Participants respond to these 12 items using a 1 (strongly disagree) to 9 (strongly agree) scale. The scores for each subscale are summed to give a single score for Machiavellianism (M=15.42, SD=6.92), psychopathy (M=14.81, SD=6.53), and narcissism (M=19.56, SD=6.66). Reliability of each subscale, as indicated by Cronbach's alpha, was high (all alphas>.85).

We then created a male high-Machiavellianism prototype face by averaging the shape, color, and texture information from the face images of the 10 men who scored highest on Machiavellianism. We also created a corresponding male low-Machiavellianism prototype face by averaging the shape, color, and texture information from the face images of the 10 men who scored lowest on Machiavellianism. These prototypes were created using specialist software widely used in face perception research to manufacture

prototype faces (DeBruine, 2018; Tiddeman et al., 2001). We then repeated this process to create male high- and low-psychopathy, male high- and low-narcissism, female high- and low-Machiavellianism, female high- and low-psychopathy, and female high- and low-narcissism prototypes. Each prototype was made from the faces of 10 individuals who scored highest or lowest on each trait following Holtzman (2011). Finally, we created masked versions of these six prototype face-pairs in which hairstyle and clothing were not visible. These images were used for testing, are shown in Figure 1.

<Figure 1>

### ***Procedure***

Participants in the online face-judgment task (55 men, 97 women, and 7 participants who did not report their sex or did not identify as male or female; mean age=23.43 years, SD=5.20 years) were randomly presented either the two pairs of Machiavellianism prototypes (each pair consisting of high- and low-Machiavellianism prototypes of the same sex), the two pairs of psychopathy prototypes (each pair consisting of high- and low-psychopathy prototypes of the same sex), or the two pairs of narcissism prototypes (each pair consisting of high- and low-narcissism prototypes of the same sex). This was the only task in the online study, which was run via faceresearch.org.

Participants shown the Machiavellianism prototypes were instructed to click on the person who looked most Machiavellian (“manipulative for personal gain; scheming; conspiring”). Participants shown the psychopathy prototypes were instructed to click on the person who looked most

psychopathic (“reckless; antagonistic; assertive with others; angry at others”). Participants shown the narcissism prototypes were instructed to click on the person who looked most narcissistic (“arrogant; vain; pompous; self-absorbed; assertive”). These trait definitions were taken from Holtzman (2011). The order in which participants completed the male-face and female-face trials was fully counterbalanced, as was the side of the screen on which any given image was presented.

## Results

We used binomial tests to compare the proportion of participants who correctly selected the high-Machiavellianism, high-psychopathy, or high-narcissism prototype with what would be expected by chance alone (i.e., 0.5). Table 1 summarizes the results of these tests. Participants correctly identified the high-narcissism male and female prototypes and the high-psychopathy male prototype significantly more often than would be expected by chance alone (both  $p < .002$ ). Participants correctly identified the high-psychopathy female prototype significantly less often than would be expected by chance alone ( $p = .003$ ). Our tests showed no evidence that participants could discriminate between the high- and low-Machiavellianism prototypes for either sex (both  $p = .89$ ). Further analyses showed no significant differences between men’s and women’s choices for any combination of sex of face and trait (all absolute  $Z$ s  $< 0.96$ , all  $p$ s  $> .54$ ).

### Table 1

*Results of Binomial Tests for Accuracy in Judgments of Dark Triad Traits.*

Trait	Face sex	Total N	Proportion correct	2-tailed p
Machiavellianism	male	50	.52	.89
Machiavellianism	female	50	.48	.89
Psychopathy	male	52	.85	<.001
Psychopathy	female	52	.29	.003
Narcissism	male	57	.72	.001
Narcissism	female	57	.77	<.001

*Note.* Total N is the total number of participants who judged that trait. Proportion correct is the proportion of those participants who correctly identified the prototype made from face images of those individuals who scored highest on that trait.

## Discussion

Using a new set of stimuli, our analyses indicated that high narcissism was the only dark triad trait that could be detected in both female and male prototypes. These results replicate Holtzman's (2011) results for narcissism and are also consistent with other recent work suggesting the existence of facial correlates of narcissism (Giacomin & Rule, 2018). Participants did not identify high-Machiavellianism female or male prototypes and detected high-psychopathy female prototypes correctly less often than would be expected by chance alone. Our results for Machiavellianism and psychopathy do not replicate Holtzman's (2011) results, suggesting putative associations between these traits and facial appearance may not be robust (see Kosinski, 2017 for another recent study finding that many previously reported links between personality and facial appearance are not robust). Holtzman (2011) reported that dark triad traits could be detected more reliably in female faces than male



faces. We do not see this pattern of results, suggesting that this sex difference is also not robust.

Several recent studies have suggested that facial correlates of narcissism may play a role in women's mate preferences. For example, women who preferred male faces with masculine shape characteristics tended to show stronger preferences for high-narcissism faces (Lyons, Marcinkowska, Helle, & McGrath, 2015). Women who reported greater openness to uncommitted sexual relationships also showed stronger preferences for high-narcissism faces (Marcinkowska, Helle, & Lyons, 2015). Brewer et al. (2018) also found that women expressed general aversions to all dark triad traits for both short- and long term relationships. All of these studies used the same dark triad face-image set. Here we have generated a new stimulus set that could be used in replications of these findings. Future studies should also investigate if participants who score higher on the dark triad can more easily detect dark triad traits in faces, since women who scored higher on Machiavellianism have been found to be better at detecting lies (Lyons et al., 2017). Additionally, it may be important to explore which facial features are related to high dark triad traits, since a recent study found people can detect grandiose narcissism based on thickness and density of targets' eyebrows (Giacomin & Rule, 2018).

Unlike Holtzman (2011), assessment of dark triad traits was made based on self-report only, rather than an aggregate measure derived from both self- and peer-reports. This difference in methodology could potentially explain the differences between our and Holtzman's results. Alternatively, differences in the results of these two studies could be due to individual

differences in ability to detect personality traits in faces that were not considered in either study. These possibilities may be fruitful topics for future research.

In conclusion, we partially replicated Holtzman's (2011) findings that people are able to detect individual dark triad traits in face prototypes. High-narcissism female and male prototypes were detected more often than would be expected by chance alone. By contrast, we found little evidence that Machiavellianism and psychopathy were reliably associated with facial appearance. Thus, our study suggests that individual dark triad traits are less reliably associated with facial appearance than previous research suggested.

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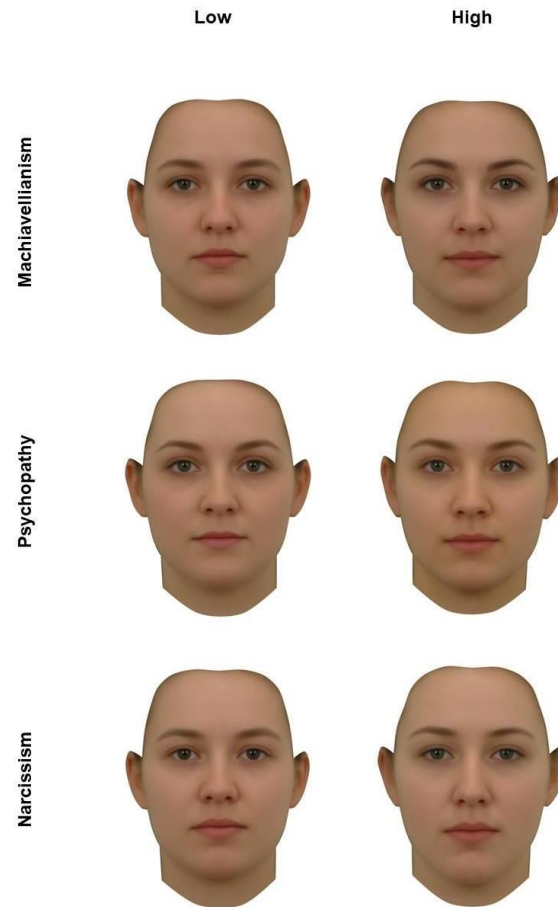
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**Figure 1.** Dark triad prototypes with the average, shape, color and texture information for the face images of the 10 individuals who scored lowest (leftmost face in each pair) and highest (rightmost face in each pair).