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# Facing a psychopath: Detecting the dark triad from emotionally-neutral faces, using prototypes from the Personality Faceaurus

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ABSTRACT

Is facial structure a valid cue of the dark triad of personality (Machiavellianism, narcissism, and psychopathy)? I obtained self-reports and peer reports of personality as well as expression-neutral photographs of targets, and then I created prototypes of people high and low on each of the three dimensions by digitally combining select photographs of Caucasian targets. The results indicated that unacquainted observers reliably detected the dark triad composite, especially in female prototypes. Thus, not only is the dark triad a set of psycho-social characteristics—it may also be a set of physical–morphological characteristics. In the Discussion, I introduce a website that stores these personality prototypes and many others (http://www.nickholtzman.com/faceaurus.htm).



## 1. Introduction

At times, even the darkest personalities can shine. For example, narcissists, who in the long-run are perceived unfavorably, are actually perceived favorably during the first hour of interaction with others (Paulhus, 1998). Such people are apt to succeed in a variety of brief interactions (Back, Schmukle, & Egloff, 2010; Campbell, 2005; Curry, Chesters, & Viding, 2011; Holtzman & Strube, 2011). In brief interactions, dark triad personalities—Machiavellians, narcissists, and psychopaths—can take advantage of people (McHoskey, 2001), successfully extract resources (Campbell, Bush, Brunell, & Shelton, 2005), and commit crimes (Neumann & Hare, 2008). Thus, a basic social challenge for onlookers is to identify dark personalities as early as possible, so as to avoid exploitation (Byrne, 1996; Funder, 1995).

Several "thin slice" studies have demonstrated successful early-detection of dark triad traits (Back et al., 2010; Fowler, Lilienfeld, & Patrick, 2009; Friedman, Oltmanns, Gleason, & Turkheimer, 2006; Holtzman & Strube, 2010; Vazire, Naumann, Rentfrow, & Gosling, 2008). Because most of these studies focused on self-expression (e.g., clothing style), the appearances of participants in those studies were uncontrolled (and in some cases, targets were encouraged to wear self-expressive clothing). Thus, it remains unclear whether basic physical cues are valid indications of the dark triad. Because there is variation in self-expression items, such as clothing, and because people can easily manipulate such aspects of their appearance, it would be helpful to identify valid cues to the dark triad that are less variable across situations and are less modifiable. Specifically, reliably identifiable physical signatures that remain more stable across situations could be very valuable to the onlookers whose self-interest depends on rapid identification of exploitative traits. Craniofacial structure in particular is potentially an excellent cue to utilize because—unlike clothing—a person cannot so easily change one's craniofacial structure.

Although the literature on craniofacial structure has not covered the dark triad, it has included studies of traits in the dominance spectrum (Berry & McArthur, 1986; Borkenau, Brecke, Mottig, & Paelecke, 2009; Perrett et al., 1998; Todorov, in press). Because dominance overlaps with the dark triad substantially (Bradlee & Emmons, 1992), the jangle fallacy (i.e., using different names for very similar constructs) may be relevant to the relationship between the two. Thus, traditional scientific language may be preventing research translation in this area. Many of the effects for facial dominance, such as its link to testosteronization (Carré, McCormick, & Mondloch, 2009; Perrett et al., 1998), could hold true for similar constructs in the trait literature, such as Machiavellianism, narcissism, and psychopathy.

En route to exploring the relationship between the dark triad and facial morphology, I obtain self-reports and peer reports of the dark triad. The three members of the triad, Machiavellianism, narcissism, and psychopathy do indeed overlap empirically (e.g.,

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Jonason, Li, Webster, & Schmitt, 2009), as is exemplified by a shared tendency to be disagreeable (Jonason & Webster, 2010). Moreover, the constructs are conceptually similar: They share a degree of manipulativeness and they each elicit social aversion in part due to their exploitative proclivities. Yet, they are distinguishable (Paulhus & Williams, 2002). Key distinctions include that Machiavellians are more introverted and scheming (Paulhus & Williams, 2002), narcissists are particularly egotistical and vain (Morf & Rhodewalt, 2001), and psychopaths are reckless and may exhibit criminal tendencies (Neumann & Hare, 2008). Despite the exponential growth of the dark triad literature in the past two decades, this is the first attempt that I know of to explore the craniofacial structures of the dark triad in a well-controlled study.

The primary goal here is to explore whether human faces are valid cues of the dark triad of personality. A secondary goal is to encourage research about the relationship between facial morphology and personality. Thus, I have created an online thesaurus of digital prototype faces for numerous personality traits—a "Personality Faceaurus", [http://www.nickholtzman.com/faceaurus.htm]—described in the Section 4.2.

## 2. Method

### 2.1. Target participants

Targets (i.e., photographed participants) participated in exchange for partial course credit. Targets whose photographs were used in this study were a subgroup of participants from a larger study ($N = 209$). Members of the subgroup (a) consented to have their pictures used for the Faceaurus, (b) are Caucasian, (c) had at least one peer provide an informant report, and (d) successfully followed the instructions described below. This subsample included 48 women and 33 men ($M$ age = 19.47).

### 2.2. Targets' self-reports

Reported in Table 1 are the key descriptive statistics for the self-reports of personality. The dark triad traits were measured using the Mach-IV (Christie & Geis, 1970), the Narcissistic Personality Inventory-40 (Raskin & Terry, 1988), the Narcissistic Personality Disorder subscale of the Multi-Source Assessment of Personality Pathology (MAPP; Oltmanns & Turkheimer, 2006), and the Self-Report Psychopathy scale (Paulhus, Neumann, & Hare, in press). Except for the MAPP, all self-report measures have been validated and are commonly employed.

### 2.3. Peer-reports

Measuring personality in part by using peer reports has increasingly become the standard in psychology (Vazire, 2006), especially because peers have better insight into certain traits than the self does (Vazire, 2010). One advantageous method that distinguishes this study from prior studies of personality and facial morphology is that it incorporates peer reports. To acquire peer reports, I asked targets to provide the email addresses of up to 10 peers (same-sex and opposite-sex friends; acquaintances from one's home town and college; current and ex-intimate partner; total peer sample: $M$ age = 20.04, $SD$ = 1.83). Of the 588 peer reports in the larger project, 208 corresponded to the 81 Caucasian targets in this particular study. The peers were emailed a link to a webpage where they were informed of the purpose of the study and were asked to provide reports regarding the dark triad. Key descriptive statistics for the peer reports are listed in Table 1.

The peers responded to questions about acquaintance level and target personality traits. Most peers reported knowing the targets quite well ($M = 7.32$, $SD = 0.99$, on a scale of 1 [not very well] to 9 [very well]). Peers completed custom measures of the dark triad as well as the MAPP-narcissism scale (Oltmanns & Turkheimer, 2006). To create custom measures of the dark triad, I wrote one item corresponding to each facet of the major theories of Machiavellianism (six facets; McHoskey, Worzel, & Szyarto, 1998, Table 1), narcissism, (four and seven facets; Emmons, 1984; Raskin & Terry, 1988), and psychopathy (four facets; Neumann & Hare, 2008). An example Machiavellianism item is "is strategic, manipulative about people". An example narcissism item is "has high vanity; is

**Table 1**
Descriptive statistics for self-reports and peer reports.

| | Self-reports | | | | Peer reports | | | |
|---|---|---|---|---|---|---|---|---|
| | Mach | Narcissism | | Psycho | Mach | Narcissism | | Psycho |
| Scale name | MachIV | NPI | MAPP | SRP-III | Custom | Custom | MAPP | Custom |
| Num. of items | 20 | 40 | 11 | 64 | 6 | 11 | 11 | 4 |
| Likert scale | 1–6 | 1–2 | 1–5 | 1–5 | 1–9 | 1–9 | 1–5 | 1–9 |
| Scale anchors | SDA-SA | Forced Ch. | 0–100% | SDA-SA | SDA-SA | SDA-SA | 0–100% | SDA-SA |
| Female targets | | | | | | | | |
| *Mean* (*SD*), full sample | 3.08 (0.57) | 1.34 (0.17) | 2.11 (0.49) | 2.05 (0.39) | 4.29 (0.76) | 3.81 (1.02) | 1.89 (0.49) | 2.55 (0.82) |
| *Mean* (*SD*), sub-sample | 3.02 (0.46) | 1.32 (0.17) | 2.02 (0.45) | 2.00 (0.40) | 4.23 (0.75) | 3.84 (0.88) | 1.91 (0.45) | 2.58 (0.81) |
| *Mean*, Highest 10 | 3.53 | 1.58 | 2.38 | 2.52 | 5.07 | 4.96 | 2.36 | 3.44 |
| *Mean*, lowest 10 | 2.61 | 1.19 | 1.54 | 1.53 | 3.48 | 2.78 | 1.39 | 1.87 |
| $\alpha$, full sample | 0.84 | 0.86 | 0.76 | 0.90 | 0.22 | 0.85 | 0.85 | 0.59 |
| $\alpha$, sub-sample | 0.78 | 0.88 | 0.73 | 0.93 | 0.00 | 0.75 | 0.83 | 0.15 |
| ICC [1,1], sub-sample | na | na | na | na | 0.55 | 0.18 | 0.70 | 0.35 |
| ICC [1,k], sub-sample | na | na | na | na | 0.81 | 0.42 | 0.88 | 0.64 |
| Male targets | | | | | | | | |
| *Mean* (*SD*), full sample | 3.22 (0.50) | 1.38 (0.16) | 2.27 (0.52) | 2.41 (0.37) | 4.59 (0.79) | 3.97 (1.06) | 1.93 (0.55) | 2.85 (1.11) |
| *Mean* (*SD*), sub-sample | 3.23 (0.39) | 1.36 (0.17) | 2.13 (0.52) | 2.38 (0.37) | 4.38 (0.81) | 4.10 (1.01) | 1.91 (0.51) | 2.77 (1.04) |
| *Mean*, Highest 10 | 3.48 | 1.63 | 2.64 | 2.63 | 5.25 | 4.90 | 2.30 | 3.84 |
| *Mean*, lowest 10 | 2.89 | 1.25 | 1.74 | 1.92 | 3.81 | 3.29 | 1.52 | 2.08 |
| $\alpha$, full sample | 0.76 | 0.83 | 0.76 | 0.89 | 0.13 | 0.84 | 0.85 | 0.65 |
| $\alpha$, sub-sample | 0.65 | 0.86 | 0.76 | 0.89 | 0.19 | 0.84 | 0.89 | 0.41 |
| ICC [1,1], sub-sample | na | na | na | na | 0.12 | 0.38 | 0.94 | 0.64 |
| ICC [1,k], sub-sample | na | na | na | na | 0.36 | 0.71 | 0.98 | 0.88 |

Abbreviations: Forced Ch. = Forced Choice; ICC = Intraclass Correlation; SDA-SA = Strongly Disagree to Strongly Agree.
For targets, the full sample and sub-sample sizes were as follows: Females ($N = 117,48$); Males ($N = 92,33$).
The $\alpha$ values were based on the peer type from whom I obtained the most responses (opposite sex friends from college).

conceited". An example psychopathy item is "hurts people, appears reckless".

### 2.4. Self–peer agreement on traits

To obtain the inter-rater agreement correlations, I first averaged the peer report scores (for each target) and correlated the means of these peer report scores with the self-report scores. I ran this analysis for both the full sample ($N = 209$ targets; $N \geqslant 515$ peers) and the subsample. Controlling for participant sex, the self–peer correlations in the full sample ($N \geqslant 162$ targets who had at least one corresponding peer report) were significant beyond chance ($p < .001$) for each trait: Machiavellianism (.26), narcissism (.47), Narcissistic Personality Disorder (.25), and psychopathy (.32). The magnitude of these correlations falls in the lower range for self–peer correlations on other major traits (Cheek, 1982; Connolly, Kavanagh, & Viswesvaran, 2007; Vazire & Carlson, 2010). Correlations for the subsample can be seen in Table 2.

Exploring the correlations between self-reports and single peer reports is more complicated than the analyses above because there is no obvious way to choose from the multiple peers per target. Thus, first I randomly selected one peer report per participant, second I correlated the randomly-selected scores with the self-reports, and third I repeated the process for 10 iterations total. Controlling for participant sex, the correlations between self-reports and single peer reports were as follows: Machiavellianism ($M = .09$, $SD = .12$), narcissism ($M = .35$, $SD = .09$), Narcissistic Personality Disorder ($M = .11$, $SD = .12$), and psychopathy ($M = .10$, $SD = .08$).

### 2.5. Target photographs

In preparation for the photographs, each participant changed into a gray t-shirt and was instructed to remove all make-up (using remover), jewelry, and any head apparel (e.g., cap, hair bands, and eye glasses). Participants were also asked to pull their hair back behind their head and off their ears and forehead as much as possible (using bobby pins, hair spray, and rubber-bands). Men shaved their beards during the study if they had not shaved in the last 24 h. I used a 12 megapixel Fuji digital camera in the Portrait Shooting Mode with flash and held the camera 4 feet, 4 inches. from the wall against which participants stood. The camera was held at nose-level. Participants were asked to provide a neutral facial expression and look straight at the camera (no tilting). Pictures were taken as many times as necessary to ensure that the participants had followed these instructions. This stage of the study was counterbalanced with self-reports.

### 2.6. Prototype creation

Fig. 1 contains the prototypes for the dark triad. Consistent with previous research, prototypes were created based on the 10 male and 10 female targets highest and lowest on each dimension (Penton-Voak, Pound, Little, & Perrett, 2006). To arrive at the final 10 faces per prototype, personality assessments were standardized, averaged across self- and peer-average reports, and then ranked. The faces were carefully marked with 112 nodes in FantaMorph™, 4th version: 28 nodes (face outline), 16 (nose), 5 (each ear), 20 (lips), 11 (each eye), and 8 (each eyebrow). To create the prototypes, I used FantaMorph Face Mixer, which averages node locations across faces. Prototypes are available online, in the Personality Faceaurus [http://www.nickholtzman.com/faceaurus.htm].

### 2.7. Cross-classified faces

Given the positive correlations among the dark triad traits (Jonason et al., 2009; Paulhus & Williams, 2002), it is unsurprising that some of the participants were cross-classified. In the most extreme case, five men were used in the creation of the "low" prototypes for the Machiavellian, narcissistic, and psychopathic prototypes; cross classification was less frequent in all other instances. (Full cross-classification Venn diagrams may be requested from the author.) The cross-classification rates may suggest that my results could reflect an overarching detectability of the dark triad, rather than detectability of each of the separate three traits per se. Because of this plausible explanation, I present the overarching detection

**Table 2**
Inter-correlations for the main personality variables, based on the subsample used for the prototypes.

| | Self-reports | | | | Average peer reports | | | |
|---|---|---|---|---|---|---|---|---|
| | Mach | Narc | NPD | Psycho | Mach | Narc | NPD | Psycho |
| Females ($N = 48$) | | | | | | | | |
| *Self-reports* | | | | | | | | |
| Machiavellianism | 1.00 | | | | | | | |
| Narcissism | 0.34 | 1.00 | | | | | | |
| Narcissistic Personality Disorder | 0.06 | 0.56 | 1.00 | | | | | |
| Psychopathy | 0.57 | 0.40 | 0.50 | 1.00 | | | | |
| *Avg. peer-reports* | | | | | | | | |
| Machiavellianism | 0.16 | 0.14 | 0.41 | 0.32 | 1.00 | | | |
| Narcissism | 0.17 | 0.33 | 0.56 | 0.50 | 0.47 | 1.00 | | |
| Narcissistic Personality Disorder | 0.09 | 0.33 | 0.61 | 0.52 | 0.48 | 0.77 | 1.00 | |
| Psychopathy | −0.03 | 0.11 | 0.26 | 0.41 | 0.38 | 0.43 | 0.60 | 1.00 |
| Males ($N = 33$) | | | | | | | | |
| *Self-reports* | | | | | | | | |
| Machiavellianism | 1.00 | | | | | | | |
| Narcissism | 0.05 | 1.00 | | | | | | |
| Narcissistic Personality Disorder | 0.32 | 0.64 | 1.00 | | | | | |
| Psychopathy | 0.62 | 0.38 | 0.53 | 1.00 | | | | |
| *Avg. peer-reports* | | | | | | | | |
| Machiavellianism | 0.22 | −0.05 | −0.01 | 0.03 | 1.00 | | | |
| Narcissism | −0.06 | 0.19 | 0.17 | 0.12 | 0.37 | 1.00 | | |
| Narcissistic Personality Disorder | −0.06 | 0.22 | 0.08 | 0.22 | −0.12 | 0.75 | 1.00 | |
| Psychopathy | 0.12 | −0.19 | −0.10 | 0.13 | 0.43 | 0.49 | 0.36 | 1.00 |

Mach = Machiavellianism; Narc = Narcissism; NPD = Narcissistic Personality Disorder; Psycho = Psychopathy.

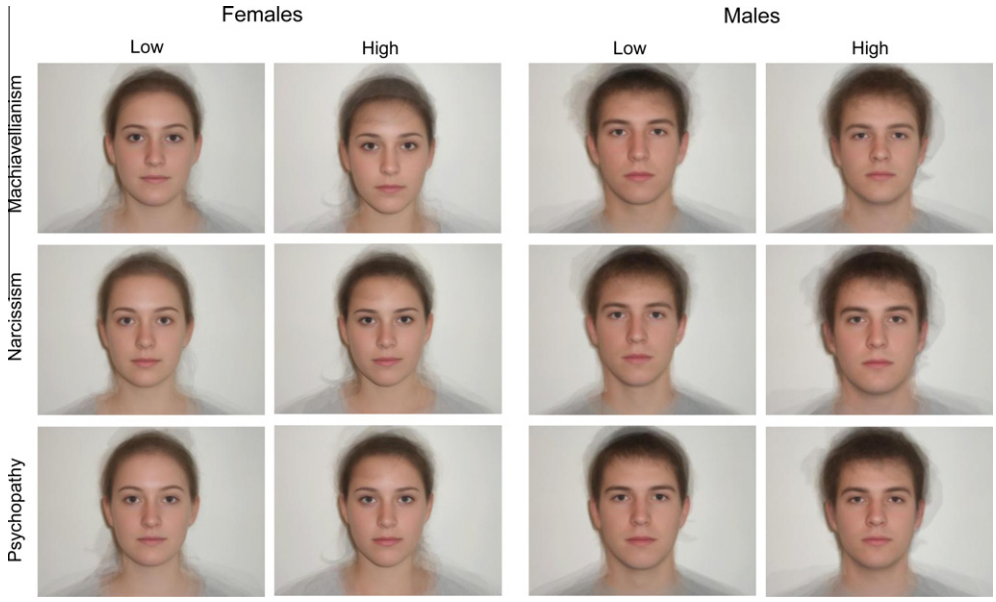


**Fig. 1.** Dark triad prototypes.

scores in addition to presenting the detection scores for the dark triad traits separately.

### 2.8. Observers

I use the term "observers" to refer to participants in the prototype-discrimination task; these 105 undergraduates (64% women) participated in exchange for partial course credit. Observers were on average 18.97 years old ($SD$ = 1.00). The racial composition of the observer sample was 68% Caucasian, 17% Asian, and 15% of another race.

### 2.9. Design for assessing the detectability of traits

I used a 2 (prototype location: left, right) × 2 (target sex: male, female) × 3 (dark triad trait: Machiavellianism, narcissism, psychopathy) within-subjects design, which included 12 trials. Prototype location was counterbalanced (left, right side of the screen). Blocking was based on target sex, and the blocks were randomly ordered. Within the blocks, each trial consisted of two images: a prototype (e.g., a psychopath) presented next to its opposite (e.g., the non-psychopath), along with a rating scale and a brief non-technical definition of the trait. For "Machiavellian", the definition was: "a person is manipulative for personal gain; scheming; conspiring"; for "narcissistic", the definition was: "arrogant, vain, pompous, self-absorbed, and assertive"; and for "psychopathic", the definition was: "reckless, antagonistic, assertive with others, angry at others". Participants used an 11-button scale to indicate confidence in their ratings, which ranged from −5 (confident it is the person on the left who matches the defined trait) to +5 (confident it is the person on the right). Reaction times faster than 500 ms (4% of responses) were deleted because I assumed that participants were randomly responding if they responded that quickly. This task took about 10 min.

## 3. Results

### 3.1. Reliability

To estimate the internal consistency of the ratings, I first reverse-scored the items for which the correct response was the left-most key. For instance, −5 was re-coded as +5; +3 was re-coded as −3. If the correct response corresponded to the right-side prototype option, then no re-coding was necessary. I computed the correlations between the scores on the two trials that were identical in every way except for the prototype location (left, right). The average correlation was $r$ (104) = .19, $p$ = .06, suggesting a small degree of consistency in the detection scores, in the expected direction.

### 3.2. Correlations among personality variables

Table 2 contains the correlations among the personality variables for self-reports and peer reports. Values are reported separately by target sex.

### 3.3. Trait detection

To explore whether the dark triad overall was detected as a general factor (Jonason et al., 2009), I collapsed the scores for the 12 trials into a composite, and then I conducted a one-sample $t$-test, $t$(104), = 8.13, $p$ < .001, $M$ = 0.67, $SD$ = .85, 95% $CI$ = 0.51–0.84, Cohen's $d$ = .79, revealing that the dark triad factor elicited significant detection. The mean of 0.67 can be directly interpreted on the 11-button scale as .67 buttons above the center of the scale, with the positivity indicating that the typical response tended toward the correct prototype. Moreover, fully 75% of the observers had mean detection scores nominally above 0.00 (i.e., chance), suggesting that the results could not be explained away by a few perceptive raters.

Upon conducting a repeated measures ANOVA, exploration of the marginal means revealed that participants detected all three dark triad traits: Machiavellianism ($M$ = 0.72, $SD$ = 1.48, $SE$ = .16, 95% $CI$ = 0.40–1.05, Cohen's $d$ = .49), narcissism ($M$ = 0.56, $SD$ = 1.56, $SE$ = .17, 95% $CI$ = 0.26–0.95, Cohen's $d$ = .36), and psychopathy ($M$ = 0.77, $SD$ = 1.38, $SE$ = .15, 95% $CI$ = 0.48–1.06, Cohen's $d$ = .56).

### 3.4. Sex-differences in being detected

The repeated measures analysis of the dark triad composite also revealed a main effect for target sex, $F$(1,70) = 12.49, $MSE$ = 150.11, $p$ = .001. Compared to male targets, traits among female targets were more easily detected. This analysis should be considered in the context of how the faces were created. I

used as many faces as possible to create the prototypes, because I wanted to create prototypes that were as extreme as possible. Consequently, I sacrificed cross-sex sample size equality in order to create the most extreme faces for women (for whom I had a larger sub-sample). Specifically, I retained all 48 female faces, even though I could have used just 33 and thus equated the sexes on the number of faces (as there were 33 male faces). The unequal sample sizes clouds the interpretation of the effect sizes. Thus, the effect sizes in this study could be due to real differences in detectability across target sexes, or due to using more extreme faces for women, a byproduct of different sample sizes for men and women. Detection of traits in males was nevertheless significant for the dark triad composite, as the 95% *CI* was 0.01–0.42. Thus, detectability of the dark triad overall was not specific to female targets, although it is true that the effect for males just barely achieved statistical significance, and should be interpreted with caution until replicated.

To explore sex-differences in detectability for each specific trait, I examined the estimated marginal means for each trait. Consistent with the analysis for the dark triad composite, observers perceived female prototypes more accurately than male prototypes in each case. For Machiavellianism, the estimated marginal means were 1.36 (*SE* = .24) for women and 0.09 (*SE* = .23) for men; for narcissism, they were 1.05 (*SE* = .24) and 0.16 (*SE* = .22), respectively; and for psychopathy, they were 1.11 (*SE* = .19) and 0.43 (*SE* = .22). While the 95% confidence intervals for females did not include zero (Machiavellianism: 0.89–1.83; narcissism: 0.57–1.52; psychopathy: 0.73–1.48), the corresponding intervals for males did include zero (−0.36 to 0.54; −0.29 to 0.60; −0.02 to 0.87, respectively). These results indicate that the detection effects are apparent for female targets but not male targets, at least at the level of individual dark triad traits.

## 4. Discussion

This study demonstrated that the dark triad—a composite of Machiavellianism, narcissism, and psychopathy—is detectable when observers are presented only emotionally-neutral faces, effects that were particularly apparent for women in this sample. Previous research on the early detection of dark triad traits had successfully identified some (less stable) aspects of appearance that serve as valid cues (e.g., clothing); however this is the first study to demonstrate the utility of a physical stimulus as stable at the human face for detecting the dark triad. These results suggest that onlookers can successfully use emotionally-neutral human faces when striving to make valid initial impressions regarding the dark triad in general. Moreover, the results demonstrate that the psychological profiles of dark personalities tend to co-vary with facial structures. Thus, beyond being a collection of psychological phenotypes (Emmons, 1984; Neumann & Hare, 2008; Raskin & Terry, 1988), or culturally crafted traits (Twenge, 2006; Twenge & Campbell, 2009), the dark triad may also involve physical phenotypes. Psycho-social traits are embedded in evolved biological organisms that have to confront the challenge of developing interpersonal strategies that are viable within the constraints of their physical selves.

This focus on physical phenotypes raises an important question: How do morphological aspects of a person come to be associated with psychological aspects of a person? To make this more vivid, consider entertaining the possibility that female narcissists have "sharp" facial features (clear cut angles in the face) whereas female non-narcissists have "soft" features (lines that bend gently about the face; Fig. 1). There are several potential ways to explain how the associations between the craniofacial structure (e.g., sharp angles) and the dark triad might come to be correlated.

The first hypothesis (Holtzman & Strube, 2011; Lalumière, Harris, & Rice, 2001), is that psychological and physical traits may be dually inherited as a package. That is, the sharp-faced woman in my running example may be influenced by heritable psychological traits (Livesley, Jang, Jackson, & Vernon, 1993; Vernon, Villani, Vickers, & Harris, 2008), but she also separately inherits genes that help build a sharp craniofacial structure. Perhaps some common evolutionary selection pressure is influencing facial structure and dark triad traits. It will be interesting to see whether future research can isolate such selection pressures. If this explanation is correct, then it is also quite possible that heritable biases in hormone levels are simultaneously contributing to craniofacial structure and contributing to the dark triad. Indeed, the literature on facial features and dominance generally favors this type of hormonal explanation (e.g., Carré et al., 2009; Stirrat & Perrett, 2010).

Another possibility is that a sharp-faced young girl—who in this example does not yet have a dark personality—reflects on her own physical self as she develops and thus forms a personality in accordance with her physical self (for a similar argument regarding mating strategies, see: Gangestad & Simpson, 2000). Whereas a soft-faced girl might shrink away from leadership roles, a sharp-faced girl may feel compelled or even entitled to pursue leadership roles. In this view, dark triad psychological traits are not heritable; instead, physical attributes are presumably quite heritable, and the crucial point is that personality formation is merely a reaction to these physical features (Lukaszewski & Roney, 2011; Tooby & Cosmides, 1990). The physical self tends to influence self-perceptions, and morphology ultimately contributes part of the variance to dark personality traits, as a person reacts to their physical inheritance. In sum, self-perceptions of physical appearance can modulate personality development.

The flip side of this interpretation is that social perceptions of physical appearance—perceptions conceived in the minds of other people—can modulate personality development of the targets. For example, people may expect a sharp-faced female to act in socially aversive ways, and therefore they evoke dark triad qualities from her. This argument is comparable to the self-perception explanation, in that the psychological traits are not necessarily inherited and in that the physical qualities are presumably somewhat inherited. Unlike the self-perception explanation, however, the source of variance in personality is social interaction, rather than self-reflection: It is the social forces that are responsible for eliciting the dark triad characteristics from the target. Some evidence is consistent with this view (Snyder, Tanke, & Berscheid, 1977; Zebrowitz, Hall, Murphy, & Rhodes, 2002). For example, some honest-looking people actually became higher in trait honesty across development (Zebrowitz, Voinescu, & Collins, 1996). Offering a social-evocation account, the work by Zebrowitz and colleagues suggests that social perceivers may expect, reward, and possibly even elicit trait honesty from the honest-looking targets. In sum, physical morphology could elicit consistent social feedback, which in turn may influence psychological individual differences.

### 4.1. Limitations and future directions

One limitation in this study was that the internal consistency of the Machiavellianism scale was absent, and this raises questions about the veracity of the results for Machiavellianism. The near-zero reliability may have been partially due to the non-overlapping Machiavellianism facets described in the literature on which my custom measure was based. The facets cover disparate topics such as ideological commitment and interpersonal warmth. Hopefully better peer report measures of the dark triad will be available in the future, so that it will be possible to determine whether the effects for Machiavellianism replicate.

Another future direction is to explore the strength of the effects for individual faces. Given that I was unsure that I would find the effect, even with the advantage of using digitally combined face photos, my strategy in this study was to maximize the possibility of finding the effect. Thus, I used the prototypes, which are relatively more likely to reveal the effects than individual faces because facial-averaging reduces the small perturbations on the surface of individual human faces that presumably introduce error in person-perception. To be sure, the magnitudes of my reported effect sizes are not generalizable to single faces, as my results are based on multiple faces. Future research could strive to determine the effect sizes for individual faces.

Often times, research into these types of phenomena aims to isolate the specific cues that allow for detection. This study did not do that (aside from exploring the face as a general cue), so it will be important to try to isolate the valid facial cues to the dark triad in future research (cue validity). It will also be important to try to determine which cues people are using (cue utilization), and whether the cues that people actually use are the cues that are most valid. In sum, a full Brunswikian lens analysis would help to determine cue validity, cue utilization, and the links between validity and utilization.

### 4.2. Personality Faceaurus

This is the first study to use face prototypes from the Personality Faceaurus (facial thesaurus) database (http://www.nickholtzman.com/faceaurus.htm), a digital collection of faces that are prototypic of major individual differences, many of which are assessed not only by self-report but also by peer reports. In addition to containing digital images for the faces shown in Fig. 1, it also includes prototypes of the Big 5 personality traits (see also: Little & Perrett, 2007; Penton-Voak et al., 2006), several personality disorders, and major sexual strategies. I plan to include prototypes for other traits (e.g., AMBI personality facets; Yarkoni, 2010) in the future. This database could be useful for a number of purposes, such as for teaching students about the links between personality and morphology or for use in zero-acquaintance or impression-formation experiments. More generally, my hope is that people find it useful to visit the Faceaurus when they begin to ponder, "What does a typical _____ looks like?".

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