



## How does chronotype mediate gender effect on Dark Triad?



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### ABSTRACT

Research has shown an association between both eveningness and Dark Triad (DT) traits and some personality characteristics. In this study, we assessed the relationship between morningness-eveningness and DT personality traits. The sample consisted of 1393 students (mean age 22.95; 616 men and 777 women). We aimed for a gender balanced sample. Correlation, comparison, and mediation analyses were carried out. Findings showed negative correlations between Composite Scale of Morningness (CSM) scores and the DT composite, Machiavellianism and psychopathy. Age was neither correlated with DT traits, nor with CSM scores. Men scored higher than women on all three DT traits and women were more morning-oriented than men. Besides, findings indicated eveningness mediating gender's effect on all DT components slightly - except for narcissism. This study shed light on a previously unassessed aspect of chronotype as mediator in the relationship between gender and DT.

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## 1. Introduction

### 1.1. Dark Triad (DT)

The Dark Triad is an emerging personality concept that focuses on the socially aversive (“dark”) side of personality without being a clinical concept (Furnham, Richards, & Paulhus, 2013). Although these personality aspects are aversive, they are considered within the range of normal functioning. The “DT” is a composition of three conceptually distinct but empirically overlapping personality traits (Furnham et al., 2013). There are three dimensions: Machiavellianism, narcissism and psychopathy. Machiavellianism is characterized with deceiving and manipulation of others in order to exploit them, narcissism refers to feelings of pride, egoism and lack of empathy, and psychopathy is used to address mostly antisocial and impulsive behaviors. Previous studies suggested a relationship between negative traits/behaviors and DT; DT was correlated with sexual harassment tendencies (Zeigler-Hill, Besser, Morag, & Keith Campbell, 2016), cyber bullying (Goodboy & Martin, 2015), more acts of animal cruelty (Kavanagh, Signal, & Taylor, 2013), and impulsivity and sensation-seeking (Crysel, Crosier, & Webster, 2013). Findings supported a relationship between scoring high on DT traits and parallel on being present-oriented in terms of time perspectives (Birkás & Csathó, 2015), that is, individuals with

greater DT traits tended to make fast decisions with increased motivation to benefit from immediate rewards. In addition, individuals with a morning chronotype are characterized with future-oriented time perspective, while evening ones prefer a present-oriented time perspective (Nowack & van der Meer, 2013). This finding might relate DT to eveningness in some extents. For example, some assume night-time activities might facilitate “cheater strategies” in mating used by people with higher levels of DT (Jonason, Jones, & Lyons, 2013). Therefore, a need to have a closer look on chronotypes and their correlates to find any possible link to DT traits is emerged.

### 1.2. Morningness-eveningness

Morningness-eveningness (M/E) is defined as circadian preference for sleep/wake habits and mental and physical performances (Adan et al., 2012). Morning types are those who go to bed early and wake up early in the morning and reach their optimum performance early during the day, while evening ones tend to have later bed and rise times and reach their highest performance during the later times of the day. Morning types reach their nadir of the body temperature earlier (Baehr, Revelle, & Eastman, 2000), their melatonin peak is earlier at night (Burgess & Fogg, 2008), and they have a higher cortisol level in the morning (Randler & Schaal, 2010). In addition, in males eveningness is related to a higher number of sexual partners (Piffer, 2010) and higher testosterone levels (Randler et al., 2012b), which is associated with higher mating success (Ellison, 2003). Many studies focused on the correlates of M/E with personality (Adan et al., 2012; Tsaousis, 2010) but the relationship with DT has rarely been assessed (Jonason et al.,

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2013; Kornienko & Derish, 2015). The present study is an extension of Jonason et al.'s work (2013). In that study, results suggested a positive relationship between eveningness and psychopathy, Machiavellianism, and the entitlement/exploitativeness facet of narcissism. Apart from this finding and to check if such a relationship in a large gender-balanced sample also occurs, the first hypothesis was that DT and eveningness should be related because both are related to a similar set of personality traits. Specifically, DT traits and mating strategies have been related with each other (Jonason & Kavanagh, 2010), and similarly, eveningness has been related to higher mating success (Randler et al., 2012a). Also, those high on DT are more likely to pursue their own benefit (Paulhus & Williams, 2002), which was also found in evening people who prefer individual values over social values (Vollmer & Randler, 2012).

Jonason et al. (2013) also found gender differences in all components of DT but were unable to show this difference in chronotype. Earlier, Randler (2007) in a meta-analysis with reviewing fifty-two studies indicated that girls and women were more morning-oriented than boys and men. Results from different studies also corroborate men's having higher levels of all DT components than women (Furnham et al., 2013; Jonason, Koenig, & Tost, 2010; Paulhus & Williams, 2002; Roeser et al., 2016). In Jonason et al.'s study (2013), they assumed chronotype might mediate the relationship of gender and DT, as evening ones are more likely to be men and high on DT but failed to test this assumption since gender displayed no differences in chronotype, but in DT. In the other words, they assumed that differences in DT traits with men being higher than women might be mediated by their chronotype, implying having an evening chronotype could decrease the unique effect of gender and therefore, having night-time activities might mediate the link between having a male gender and possessing higher DT traits. To test the mediation effect one should note that the independent variable (IV) must be related to both mediator (M) and dependent variable (DV), and the mediator per se also must be related to the dependent variable. In Jonason et al.'s study (2013), although they found a relationship between DT (DV) and chronotype (M), gender (IV) displayed differences only in DT but not in chronotype. So, statistically they were unable to check for mediation effect of chronotype since it showed no shared variance with gender. As a meta-analysis (Randler, 2007) suggested, in general, women have a higher morningness proclivity compared to men and therefore, based on this evidence and the preliminary results of our study we tested a) if we could replicate the results turned out in Jonason et al.'s study (2013) and b) whether chronotype might mediate the effect of gender on DT in a large gender-balanced sample.

## 2. Materials and methods

### 2.1. Participants and data collection

Online surveys were established and distributed among the students from different German universities in Baden-Wuerttemberg state but also we aimed to have a gender-balanced sample and distributed the link around in technical universities (predominantly chosen by men). We carried out an online survey asking for DT traits, morningness-eveningness and some demographic factors (age, gender). Mean age was  $22.95 \pm 3.77$  years, and ranged from 17 to 57 years. There were 616 men and 777 women in this study.

### 2.2. Measures

#### 2.2.1. Composite scale of morningness

We used the 13-item Composite Scale of Morningness (Smith, Reilly, & Midkiff, 1989). The items are Likert type coded with 10 items coded 1–4 and 3 items coded 1–5 leading to a maximum score of 55. High scores represent high morningness. The alpha for the CSM was 0.88 in the present study.

#### 2.2.2. DT

The DT traits were assessed by the 12-item version of the Dirty Dozen (Jonason & Webster, 2010). Participants were asked to rate the degree to which they agree with statements on a 9-point Likert scale (1 = Disagree Strongly; 9 = Agree Strongly) reflective of Narcissism (e.g., "I like to be the center of attention"), Machiavellianism (e.g., "It's not wise to tell your secrets"), and Psychopathy (e.g., "I like to get revenge on authorities"). Every dimension is based on a four item scale. Cronbach's alpha were: Machiavellianism (0.79), psychopathy (0.65), and narcissism (0.77).

### 2.3. Statistical analysis

Using SPSS 22 we performed correlational analyses to assess the relationship between CSM scores and DT traits. In addition, we applied *t*-test for exploring gender differences in DT components and CSM total score and chronotype differences in DT traits. For mediation analysis we used PROCESS procedure developed for SPSS (Hayes, 2012) to run bootstrapping technique (Preacher & Hayes, 2008) to reveal any possible mediational effect.

## 3. Results

Descriptive statistics revealed following means and SDs; age ( $22.95 \pm 3.77$ ), Machiavellianism ( $3.37 \pm 1.70$ ), psychopathy ( $3.13 \pm 1.57$ ), narcissism ( $4.41 \pm 1.69$ ), DT ( $3.63 \pm 1.31$ ), and CSM ( $32.54 \pm 7$ ). Bivariate correlations between DT traits and CSM scores became significant for the DT composite, Machiavellianism and psychopathy in negative direction which reveals that evening-oriented individuals score higher on DT traits.

When splitting by gender, we found similar correlations in women (Table 1). In men, however, the correlations among CSM scores and Machiavellianism were low albeit significant. Thus, the correlations were stronger in women. Age was neither correlated with DT traits, nor with CSM scores. Therefore, it was not considered in further analyses.

Comparison analyses showed gender differences in all DT components where men scored higher than women. Women showed a higher tendency toward morningness compared to men. The results are depicted in Table 2.

In addition, we searched for possible differences between morning and evening ones as two extreme chronotypes in DT components. Results supported that evening ones scored higher on DT composite and all DT components, except for narcissism. The results are presented in Table 3.

Mediation analyses were carried out to test any possible mediation by chronotype in the relationship of gender and DT. In these tests, mediation occurs significantly if the 95% bias-corrected confidence intervals for the indirect effect do not include zero (Hayes & Scharkow, 2013). All results were obtained based on 2000 bias-corrected bootstrapped samples and the standardized coefficients were reported. Regarding DT total score, results showed a significant mediation of chronotype

**Table 1**

Bivariate correlations between DT traits and CSM scores in men, women and the total sample.

		Overall CSM	Women CSM	Men CSM
Machiavellianism	<i>r</i>	−0.119**	−0.119**	−0.078
	<i>p</i>	<0.001	0.001	0.052
Psychopathy	<i>r</i>	−0.141**	−0.134**	−0.082*
	<i>p</i>	<0.001	<0.001	0.042
Narcissism	<i>r</i>	−0.039	−0.051	0.003
	<i>p</i>	0.15	0.158	0.937
DT	<i>r</i>	−0.124**	−0.122**	−0.068
	<i>p</i>	<0.001	<0.001	0.093

\* *p* < 0.05.

\*\* *p* < 0.01.

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