

Dark Triad traits within the framework of the Circumplex Model of Personality

Metatraits

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This is an unedited manuscript that has been accepted for publication in *Journal of Individual Differences*. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form.

Acknowledgement

The authors have no conflict of interest to declare. This work was supported by grant 2015/19/N/HS6/00685 from the National Science Centre, Poland.

Abstract

The present study attempts to locate the Dark Triad traits within the space of the Circumplex Model of Personality Metatraits. The study was conducted on a sample of 339 adolescents (48.2% females) in Poland, which were administered the Circumplex of Personality Metatraits Questionnaire and two measures of the Dark Triad traits, the Short Dark Triad (Jones & Paulhus, 2014) and the Narcissistic Admiration and Rivalry Questionnaire (Back et al., 2013). We hypothesized that psychopathy and Machiavellianism will be located near Alpha-Minus (Disinhibition), while narcissism will be located near Delta-Minus (Sensation Seeking). Moreover, we expected that the two narcissistic strategies of narcissistic admiration and rivalry will be located near Beta-Plus (Plasticity) and Alpha-Minus respectively. The hypotheses were tested using the Structural Summary Method, of which the results mostly corroborated our expectations. The overlap of Machiavellianism and psychopathy, as well as narcissism's place in the Dark Triad are discussed.

Keywords: personality metatraits, narcissism, psychopathy

Introduction

The Circumplex of Personality Metatraits

Within the Five Factor Model, the common variance of the basic traits may be described as a personality metatrait (McCrae & Costa, 1997; DeYoung, Peterson, & Higgins, 2002). Most research on personality metatraits argues the existence of two metatraits – Plasticity and Stability, which are also referred to as the Two-Factor model of personality (Digman, 1997; DeYoung et al., 2002; Cieciuch & Strus, 2017). Plasticity is interpreted as novelty and excitement seeking, and Stability is interpreted as a general tendency to socialize (DeYoung 2015; Cieciuch & Strus, 2017). Some research has argued that the observed covariation between Plasticity and Stability can be further explained by the introduction of the General Factor of Personality (GFP), which can be described as a socially desirable mix of all basic personality traits associated with high self-esteem and well-being (Rushton & Irwing, 2008). Whilst the presence of the Plasticity and Stability is generally accepted (DeYoung, 2015), there is an ongoing debate about whether the GFP accurately describes personality structure or if it is a method artifact (Loehlin, 2013; Muncer, 2011).

Strus and colleagues (2014) posited that the findings concerning the meaning of the GFP are indeed accurate (Rushton & Irwing, 2008), but that discussions regarding the utility of the GFP are based on the erroneous assumption of the GFP's position within the structure of personality. Strus et al. (2014) argue that personality metatraits can be arranged not in a hierarchical structure, but rather within a circular structure in which each metatrait has a positive and a negative pole. The model is based on two main and orthogonal axes: Alpha (Stability) and Beta (Plasticity). The GFP has been reinterpreted (and renamed Gamma) as a metatrait on the same level as Alpha and Beta. More specifically, within the Circumplex of Personality Metatraits (CPM) model, the GFP dimension represents two possible combinations of Stability and Plasticity (high Stability and high Plasticity on the positive pole

and low Stability and low Plasticity on the negative pole of Gamma). Owing to the circular character of the model, the existence of other combinations of Alpha and Beta (i.e., high Stability and low Plasticity and low Stability and high Plasticity), which are orthogonal to Gamma, was hypothesized and labelled as the Delta metatrait (Strus et al., 2014). The graphical representation of the CPM model is presented in Figure 1.

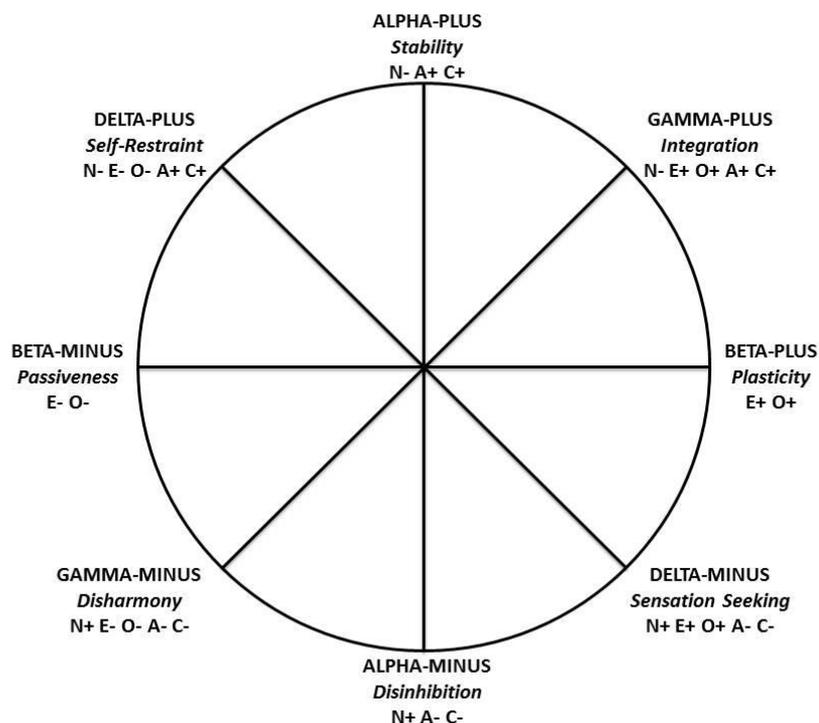


Figure 1. Graphical representation of the Circumplex of Personality Metatraits Model.

Note. N = Neuroticism; E = Extraversion; O = Openness to experience; A = Agreeableness; C = Conscientiousness. Figure adapted from Strus et al. (2014).

Within the CPM model, the psychological meaning of Alpha and Beta is similar to the descriptions of Stability and Plasticity (DeYoung et al., 2002), whereas Gamma is the reinterpretation of the GFP and is characterized as a marker of mental health (i.e., its positive pole is the optimum configuration of the personality traits, whereas its negative pole represents the most maladaptive configuration). The Delta metatrait is interpreted as a dimension of behavioral control. The positive pole of the Delta metatrait is described as self-

restraint, which is a combination of high agreeableness and conscientiousness and low neuroticism, extraversion, and openness to experience. Delta is linked to low emotionality, behavioral control, and conformism. The negative pole, which represents the opposite combination of basic traits, was labelled sensation-seeking and characterized by impulsiveness, emotional liability, stimulation seeking, provocativeness, and expansiveness (Strus et al., 2014). For a detailed description of the metatraits, see Strus and Cieciuch (2017).

The Dark Triad within the CPM

The CPM model does not only visually organize the relationship between personality metatraits, but also can be treated as a matrix which integrates many different psychological constructs (e.g., temperamental traits, interpersonal traits, values, affects, personality disorders and mental health constructs; Strus & Cieciuch, 2017; Zawadzki, 2018). Owing to this fact, it is worthwhile to test how the Dark Triad of personality (i.e., psychopathy, Machiavellianism and narcissism; Paulhus & Williams, 2002) are located within the CPM.

The Dark Triad is a cluster of socially malevolent personality traits and is comprised of subclinical psychopathy, Machiavellianism, and subclinical narcissism (Paulhus & Williams, 2002). Psychopathy is characterized by emotional coldness, lack of anxiety, and impulsivity (Hare, 1985). Machiavellianism is characterized by emotional coldness, tendencies toward strategic manipulation, and a lack of conventional morality (Christie & Geis, 1970). Narcissism is typified by a grandiose sense of self, entitlement, a sense of superiority, and dominance (Raskin & Hall, 1979).

Narcissism is comprised of both adaptive and maladaptive features (Ackerman et al., 2016). Back et al. (2013) were the first to partial these two faces of narcissism through differentiation of the bright side of narcissism – admiration, (i.e., social status seeking through the means of self-promotion) and the dark side of narcissism – rivalry, (i.e., avoiding social

failure through the means of self-defense). The distinction of admiration and rivalry has been demonstrated in previous research, for example, by showing differential relationship with envy, pride or self-esteem (Back et al., 2013; Lange, Crusius & Hagemeyer, 2016; Rogoza, Kwiatkowska, Kowalski, & Ślaski, 2018) and thus, further exploration of this scale is encouraged (Krizan & Herlache, 2018).

Vernon et al. (2008) conducted a behavioural genetic study relating the Dark Triad to the five factor model of personality (openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism) and found that psychopathy had significant negative correlations with only agreeableness (-.59) and conscientiousness (-.37). Recent meta-analyses supported these results, reporting strong negative relationships with conscientiousness and agreeableness, and negligible or no relationships with other traits (O'Boyle et al., 2015; Muris et al., 2017; Vize et al., 2018). In relation to metatraits, psychopathy has been shown to be inversely correlated with traits related to Gamma-Plus (Kowalski et al., 2016). Based on this evidence, the consistency of psychopathy with Strus and colleague's (2014) description of the Alpha-Minus (disinhibition; antisocial tendencies, low frustration tolerance, lack of restraint, antagonism, and aggression) and Delta-Minus metatraits (sensation seeking; provocativeness, stimulation-seeking, impulsiveness, grandiosity, and emotionality), we predict that psychopathy will lie near Alpha-Minus and Delta-Minus within the CPM model.

With regards to Machiavellianism, Vernon and colleagues (2008) found significant positive correlations with neuroticism (.23) and significant negative correlations with agreeableness (-.49), and conscientiousness (-.32). Similar to psychopathy, meta-analyses mostly support the relationship with low agreeableness and conscientiousness (Muris et al., 2017; O'Boyle et al., 2015; Vize et al., 2018). With respect to metatraits, Kowalski and colleagues (2016) found that Machiavellianism was also negatively correlated with traits

associated with Gamma-Plus. Based on this evidence, we also expect to find Machiavellianism to lie between Alpha-Minus and Delta-Minus within the CPM model.

Narcissism is often described as the combination of two basic personality traits: disagreeableness and extraversion (Paulhus, 2001). The disentanglement of admiration and rivalry sheds new light on the research on narcissism and personality because only the admiration component of narcissism is related to extraversion and only the rivalry component of narcissism is related to disagreeableness (Back et al., 2013; Rogoza, Wyszynska, Maćkiewicz, & Ciecuch, 2016). In its relation to personality metatraits, narcissism has been found to be unrelated to traits related to Gamma-Plus (Kowalski et al., 2016), whereas when two dimensions of narcissism were taken into account, admiration was found to be related mostly with Beta-Plus, while rivalry is related to Alpha-Minus (Rogoza, Żemojtel-Piotrowska et al., 2016). With regards to the CPM model (Strus et al., 2014), it can be deduced that: a) narcissism is orthogonal to Gamma-Plus; b) admiration is more strongly related to Beta-Plus; and c) rivalry is more strongly related to Alpha-Minus. Thus, based on the logic behind the circumplex model, narcissism could be located near the metatrait of Delta-Minus (orthogonal to Gamma-Plus), with the two faces of narcissism located near Alpha-Minus (rivalry) and Beta-Plus (admiration).

Current study

In the current study, we investigate where the Dark Triad traits are located within the circumplex model of personality metatraits. We hypothesize that Machiavellianism and psychopathy will be mostly concentrated around Alpha-Minus and Delta-Minus metatraits. We also expect that narcissism will be most closely related to the Delta-Minus metatrait, and more specifically, we hypothesize that rivalry will be more strongly related to Alpha-Minus, whilst admiration will be more strongly related to Beta-Plus. We test these hypotheses by investigating the correlational pattern of relations between personality metatraits and the Dark

Triad and through the examination of how the Dark Triad traits inscribe in the circular structure of the personality metatraits space using the Structural Summary Method (Zimmerman & Wright, 2017).

Method

Participants and procedure

The sample consisted of 339 adolescents attending their first year of high school ($M_{\text{age}} = 16.04$ years; $SD_{\text{age}} = 0.35$; range = 15 to 18). Among these, 40 students did not fully complete the administered questionnaires. The study was conducted at the beginning of the school year in four different high schools in Poland. Before the study was conducted, written consent was obtained from their parents. The gender distribution within the sample was nearly equal with 48.2% female and 51.8% male.

Measures

The Circumplex of Personality Metatraits Questionnaire (Strus & Ciecuch, 2017) is a questionnaire developed to measure eight personality metatraits. It comprises 72 items (9 items for each metatrait), on which respondents rate their agreement using a five-point Likert-type scale.

Short Dark Triad (Jones & Paulhus, 2014, Polish adaptation: Rogoza & Ciecuch, 2017) comprises 27 items measuring Dark Triad traits. Respondents rate their agreement to the items using a five-point Likert type scale.

Narcissistic Admiration and Rivalry Questionnaire (Back et al., 2013, Polish adaptation: Rogoza, Rogoza, & Wszyńska, 2016) comprise 18 items measuring two dimensions of narcissism: self-enhancing admiration and antagonistic rivalry. Participants rate their agreement using a six-point Likert type scale.

Results

Relations between the metatraits of personality and the Dark Triad traits

As an a priori check of the circumplex character of the CPM, CircE (Grassi, Luccio, & Di Blas, 2010), a specialized R package dedicated to evaluate circumplex models using structural equation modeling, was used. In the evaluation of the model, we used standard criteria, i.e., CFI > .900 and SRMR < .08 (Byrne, 1994). Moreover, we tested whether the data are organized within a meaningful circumplex structure (i.e., do the correlation coefficients between dark personality traits and the metatraits of personality drop and rise in magnitude as they are moving from a diagonal; Tracey, 2000). To detect sinusoidal patterns of relations we used the sinusoidal fit index (SFI; Hanel, Zacharopoulos, Mégardon, & Maio, 2017), for which values below .10 suggest very good fit, below .20 good and below .30 an acceptable fit. The analyzed model was confirmed to have the circumplex structure (CFI = .936; SRMR = .037) and the estimated angular locations, with 95% confidence intervals, are presented alongside the correlations between the CPM dimensions and the Dark Triad traits in Table 1, the correlations between the Dark Triad traits are presented in Table 2 and the correlations between the personality metatraits are in Table 3.

Table 1

Angular location of personality metatraits, with 95% confidence intervals, and the correlations between personality metatraits and the Dark Triad traits

	Angular location	Psychopathy	Machiavellianism	Narcissism	Admiration	Rivalry
Beta-Plus	0[0, 0]	.05	.21**	.28**	.46**	.18**
Gamma-Plus	21[13, 30]	-.14*	.04	.14*	.38**	-.02
Alpha-Plus	53[43, 64]	-.26**	-.07	.04	.18**	-.11*
Delta-Plus	85[73, 97]	-.30**	-.02	-.07	.11	-.07
Beta-Minus	143[130, 156]	-.11	-.05	-.31**	-.21**	-.03
Gamma-Minus	210[196, 223]	.23**	.18**	-.17**	-.09	.26**
Alpha-Minus	249[238, 261]	.61**	.48**	.24**	.29**	.55**
Delta-Minus	293[283, 303]	.50**	.43**	.35**	.47**	.41**
SFI		.04	.07	.12	.09	.05

* $p < .05$, ** $p < .01$; two-tailed

Note. SFI = sinusoidal fit index.

Table 2

Correlations between Dark Triad traits

	Narcissism	Psychopathy	Machiavellianism	Admiration	Rivalry
Narcissism	.66				
Psychopathy	.34**	.69			
Machiavellianism	.35**	.56**	.70		
Admiration	.72**	.30**	.37**	.83	
Rivalry	.35**	.52**	.57**	.45**	.83

** $p < .01$; two-tailed. Reliability estimates (α) are presented at diagonal.

Table 3

Correlations between metatraits of personality

	Delta+	Alpha+	Gamma+	Beta+	Delta-	Alpha-	Gamma-	Beta-
Delta+	.66							
Alpha+	.55**	.69						
Gamma+	.37**	.59**	.70					
Beta+	.29**	.44**	.66**	.78				
Delta-	-.17**	-.01	.23**	.39**	.77			
Alpha-	-.23**	-.33**	-.17**	.00	.58**	.77		
Gamma-	-.01	-.11	-.25**	-.09	.24**	.49**	.80	
Beta-	.34**	.10	-.02	-.24**	-.15*	.01	.29**	.66

* $p < .05$, ** $p < .01$; two-tailed. Reliability estimates (α) are presented at diagonal.

All of the dark traits assumed a sinusoidal pattern of relations with the metatraits of personality. All of the variables had fit estimates at the “very good” level except for the SD3 narcissism, which had a “good” fit. These results provide further evidence supporting the circular structure of the CPM model. Psychopathy and Machiavellianism were most strongly related with the Alpha-Minus and Delta-Minus metatraits, which confirmed our expectations regarding their relations with personality metatraits. Although their profiles of relations with the remaining metatraits was similar, there were also some differences (i.e., psychopathy negatively correlated with Delta-Plus, Alpha-Plus and Gamma-Plus, whilst Machiavellianism positively correlated with Beta-Plus). The SD3 narcissism was most strongly related to the Delta-Minus metatrait, which corroborated our general expectations. For the narcissistic

strategies, in addition to being related to Delta-Minus, admiration was also most strongly related to Beta-Plus, while rivalry was most strongly related to Alpha-Minus, supporting our hypotheses. Whereas the profile of narcissistic rivalry was similar to those of psychopathy and Machiavellianism, the profiles of admiration and SD3 narcissism were different, as they were both positively linked to Gamma-Plus, but only admiration was positively linked to Alpha-Plus, and only SD3 narcissism was negatively to Gamma-Minus. To test the differences in strength of correlations between Dark Triad traits and personality metatraits we conducted a series of Fisher Z tests, which results are presented in Table 4.

Table 4

Differences in the strength of correlations between analyzed variables (Fisher Z-values)

	Psy-Mach	Psy-Nar	Psy-Adm	Psy-Riv	Mach-Nar	Mach-Adm	Mach-Riv	Nar-Adm	Nar-Riv	Adm-Riv
B+	2.97**	3.53**	6.37**	2.31*	1.11	-	0.57	4.53**	1.57	4.98**
G+	3.32**	4.22**	7.83**	2.12*	1.52	4.19**	5.44	1.11	5.78**	2.43**
A+	3.56**	2.91**	6.51**	2.70**	1.66*	3.86**	0.75	3.25**	2.27*	4.80**
D+	5.26**	4.30**	6.09**	4.15**	0.76	2.00*	0.93	4.15**	0.00	2.96**
B-	1.11	0.90	1.48	1.41	4.04**	2.49**	0.37	2.40**	4.34**	2.99**
G-	0.94	0.77	4.71**	0.55	5.34**	4.17**	1.53	1.86*	6.60**	5.83**
A-	3.00**	6.53**	5.58**	1.38	4.02**	3.27**	1.58	1.20	5.34**	4.91**
D-	1.50	2.59**	0.53	1.84*	1.35	0.72	0.42	3.08**	1.01	1.14

* $p < .05$, ** $p < .01$

Note. B+ = Beta-Plus; G+ = Gamma-Plus; A+ = Alpha-Plus; D+ = Delta-Plus; B- = Beta-Minus; G- = Gamma-Minus; A- = Alpha-Minus; D- = Delta-Minus; Psy = Psychopathy; Mach = Machiavellianism; Nar = Narcissism; Adm = Admiration; Riv = Rivalry.

Narcissism and narcissistic admiration turned out to differ in most of the comparisons to other dark traits, while Machiavellianism and narcissistic rivalry did not differ across the pairs of correlations.

The Dark Triad traits within the circular space of the metatraits of personality

To test how the Dark Triad traits can be located within the circular space of the CPM model, we used the Structural Summary Method from the circumplex R package (Zimmermann & Wright, 2017). In this approach, the correlations of a given measure with each CPM octant are examined and should follow the theoretically predicted pattern of relations. The analyses provide a set of estimates: (1) elevation, which is the average correlation across all octants, of which values of $|\geq .15|$ or more are notable and reflect differentiation or specificity of content; (2) amplitude, representing the distance between the average correlation and the peak correlation; (3) angular displacement, or the displacement of the peak of the curve from 0° ; and (4) model fit (R^2), for which values of $> .70$ represent adequate fit and $> .80$ good fit (Wright, Pincus, Conroy, & Hilsenroth, 2009; Wright, Pincus, Hopwood, Markon, & Krueger, 2012; Zimmerman & Wright, 2017). The obtained results are presented in Table 5 and the projection of the Dark Triad traits within the circular space of the CPM is depicted on Figure 2.

Table 5

Structural summary statistics with 95% confidence intervals for the dark personality traits

	Elevation	Beta	Alpha	Amplitude	Displacement	R^2
Adm	0.20 [.014, .026]	.31[.24, .38]	-.01[-.10, .08]	.31[.25, .38]	358.7[342.7, 13.9]	.896
Riv	0.15[.08, .022]	.09[.02, .15]	-.30[-.40, -.20]	.31[.22, .42]	285.9[273.6, 299.8]	.933
Psych	0.07[.01, .014]	.12[.04, .19]	-.43[-.51, -.33]	.44[.35, .53]	285.2[275.7, 295.7]	.936
Mach	0.15[.09, .022]	.12[.05, .19]	-.24[-.34, -.14]	.27[.18, .36]	296.5[280.6, 316.7]	.909
Narc	0.06[.01, .012]	.28[.20, .35]	-.07[-.16, .03]	.29[.22, .36]	346.2[327.7, 6.0]	.859

Note. Adm = Admiration; Riv = Rivalry; Psych = Psychopathy; Mach = Machiavellianism; Narc = Narcissism.

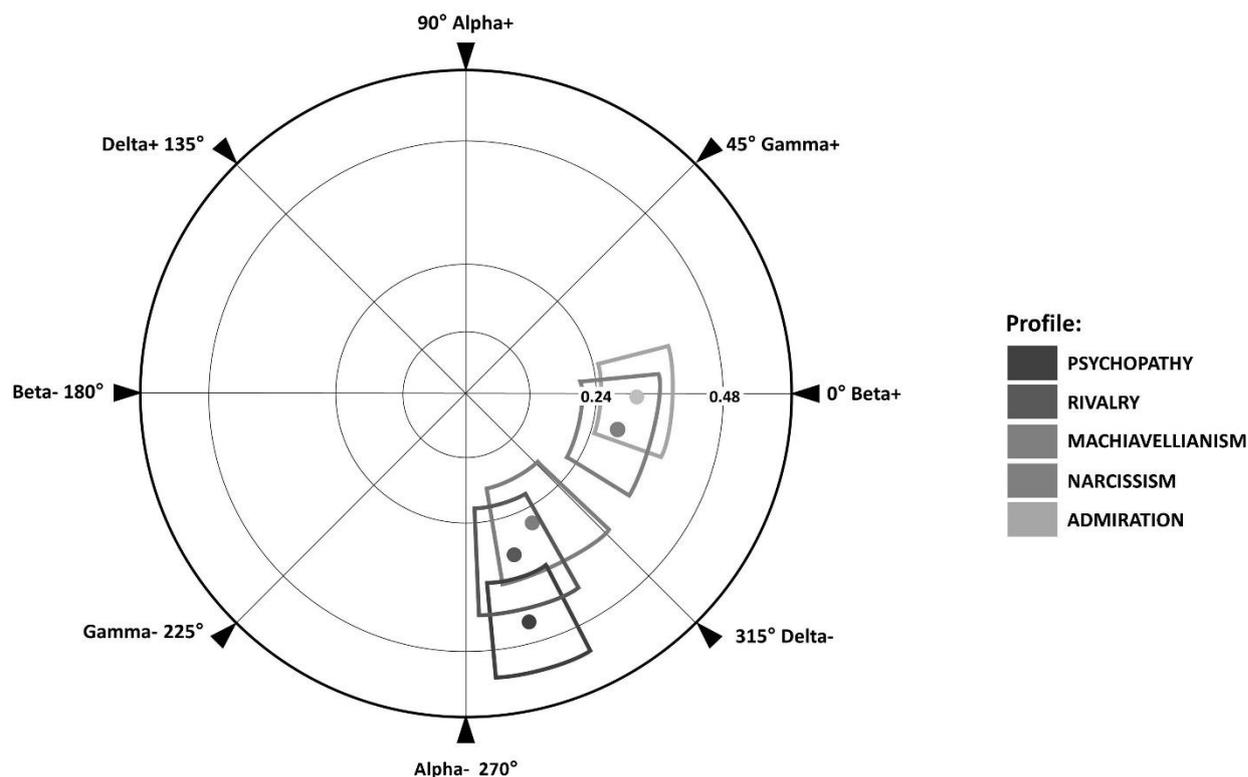


Figure 2. Amplitude and angular displacement confidence intervals for the Dark Triad traits on the Circumplex of Personality Metatraits Space.

All of the analyzed measures were well-fitted within the CPM circumplex pattern. The elevation values were notable for admiration, rivalry and Machiavellianism suggesting more general relations with the personality metatraits than for psychopathy and narcissism. The amplitudes were moderate for all variables, and highest for psychopathy, suggesting that psychopathy contains most of the Alpha-Minus specificity within the construct. The angular displacement of the Dark Triad traits grouped mostly in accordance with their hypothesized locations, i.e., psychopathy and Machiavellianism were located between Alpha-Minus and Delta-Minus, admiration was located near Beta-Plus, rivalry was located near Alpha-Minus, while SD3 narcissism was located between Delta-Minus and Beta-Plus.

Discussion

In the current study, we investigated the Dark Triad (i.e., psychopathy, Machiavellianism, and narcissism; Paulhus & Williams, 2002), supplemented by the differentiation of the bright and dark faces of narcissism (Back et al., 2013) in the context of the broader model of personality structure using the circumplex model of personality metatraits (Strus et al., 2014). In regard to the expected pattern of relations, we confirmed our expectations that psychopathy and Machiavellianism were most strongly related with Alpha-Minus, and that narcissism was most strongly related to Delta-Minus, whilst the bright side, admiration, was related to Beta-Plus, and its dark side, rivalry, was related to Alpha-Minus. Although our results appear theoretically plausible, the results also raise the questions of why there is an observed overlap between Machiavellianism and psychopathy, and should all of narcissism be treated as a part of the Dark Triad or only its dark side?

Are Machiavellianism and psychopathy, as currently measured, redundant?

Although Machiavellianism and psychopathy are conceptually similar, Machiavellianism includes features such as self-control and the ability to delay gratification which are theoretically inconsistent with psychopathy (Jones & Paulhus, 2009). Behavioral studies have corroborated these theoretical distinctions. For instance, Bereczkei, Deak, Papp, Perlaki, and Orsi (2013) demonstrated that individuals scoring high on Machiavellianism showed elevated brain activity in the areas of the brain that are associated with inference-making and risk anticipation when participating in an economic game. Moreover, only Machiavellianism was found to be positively associated with fluid intelligence (Kowalski, Kwiatkowska, Kwiatkowska, Ponikiewska, Rogoza, & Schermer, 2018). Also, Jones and Paulhus (2017) found that those scoring high on psychopathy tended to cheat in a coinflip task when there was a high-risk of punishment, while those who scored high on Machiavellianism only did so when they were ego-depleted. In the same vein, Jones and

Weiser (2014) found that although both Machiavellianism and psychopathy was associated with higher rates of retrospective infidelity, only psychopathic infidelity was related to relationship dissolution, suggesting that Machiavellianism is more strategic in offensive behaviour. Moreover, previous research has shown that those who score high on Machiavellianism are more flexible in their behavior depending on their situational constraints, while those who score high on psychopathy are not. For instance, both Machiavellianism and psychopathy is associated with using negative mate retention tactics, however, while those scoring high on psychopathy do so for both long and short-term relationships, those who score high on Machiavellianism use negative retention strategies only for short-term relationships (Jones, & De Roos, 2017). Although these points are valid, self-report evidence has consistently shown that both psychopathy and Machiavellianism are associated with diminished self-control and low conscientiousness (Muris, Meckelbach, Otgaar, & Meijer, 2017; Petrides, Vernon, Schermer, & Veselka, 2011), suggesting that psychopathy and Machiavellianism are almost identical as they are currently measured (Miller, Hyatt, Maples-Keller, Carter, & Lynam, 2017; O'Boyle et al., 2015). Our results do not explicitly take either side of this argument because although the results of the Structural Summary Method did indeed reveal an overlap between psychopathy and Machiavellianism and there were non-significant differences in the strength of the correlations between the personality metatraits, psychopathy and Machiavellianism were located in different spaces within the circumplex model and each had distinct correlations with other traits.

Does narcissism belong in the Dark Triad?

Narcissism has a dualistic nature in that narcissism has both adaptive and maladaptive features (Ackerman et al., 2016). Because the Dark Triad model assumes that all three traits are socially malevolent (Paulhus & Williams, 2002), it is plausible to claim that the Dark Triad refers to the more maladaptive aspects of narcissism. The disentanglement of the

agentic and antagonistic aspects of narcissism (Back, 2018) sheds some light on the integration of narcissism under the umbrella of the Dark Triad. Our results revealed that it was only antagonistic rivalry which shared most of the common features and was located between psychopathy and Machiavellianism, whereas agentic admiration differed in its profile from the other Dark Triad traits. Paulhus (2014) stated that the term, “dark personality”, refers to a group of socially aversive traits. Psychopathy, narcissistic rivalry and Machiavellianism fit perfectly within this dark category, as they were located near Alpha-Minus. In contrast narcissism, as measured by SD3, only comprised some elements of antagonism (as it was located closer to Delta-Minus), suggesting that this measure is not entirely “dark”. On the other hand, narcissistic admiration, which does not comprise elements of antagonism (as it was located closely to the Beta-Plus), does not fit the definition of a “dark personality” trait.

Thus, it might be seen that only half of the construct of narcissism may successfully be incorporated within the construct of the Dark Triad. This issue is important as there are individuals who do not score high on rivalry, but score high on admiration (Wetzel, Leckelt, Gerlach, & Back, 2016), thus in regard to narcissism, there are some individuals that do not have much in common with those scoring high on psychopathy and Machiavellianism.

Limitations

There are several limitations to the current study. First, the sample size, although equally distributed by gender, may be too small as even though the participant per item ratio was adequate for NARQ and SD3 (larger than 10:1), it was only approximately 5:1 for the CPM questionnaire. Second, in the current sample we studied adolescents and thus our results may be age restricted as both the NARQ and SD3 were originally developed and validated in adult samples (Back et al., 2013; Jones & Paulhus, 2014). Moreover, this age restriction might result in an alternative interpretation of our results associated with the development of the

prefrontal cortex (PFC), a brain region responsible for cognitive control (e.g., inhibition, delay gratification, working memory maintenance, task switching; Crone & Steinbeis, 2017). The PFC undergoes many changes throughout the development and requires over 20 years to fully mature, therefore during adolescence, many anatomical and neurochemical changes occur in the PFC (Caballero, Granberg, & Tseng, 2016; Diamond, 2002). As the ability of impulse regulation is a key feature of Machiavellianism (Jones & Paulhus, 2009) and the PFC is not fully mature yet (Diamond, 2002); is it plausible to study the differences in the Dark Triad traits at all in adolescent samples? As adolescents do not possess cognitive ability to inhibit their impulses, how does Machiavellianism differ from psychopathy? The current study is unable to determine whether it is the developmental stage of the participants, that influenced the overlap between Machiavellianism and psychopathy, or if this pattern remains stable in adulthood. In light of these limitations, we suggest that the results should be interpreted with caution.

A further limitation is that we only used self-report measures, without any behavioral indicators, and brief measures of Machiavellianism and psychopathy. Although short measures are useful in that they are able to present mutual relations between analyzed constructs, the standalone measures of each trait should be used in future studies in order to capture the full depth of the analyzed constructs, especially as the reliability estimates of the short scales used in this study were low. In the current study we used a full measure of narcissism; however, both narcissism scales from the NARQ comprise exactly the same number of items as the SD3 scale. Finally, some of the personality metatraits turned out to be positively related (e.g., Alpha-Plus and Beta-Plus) or weakly negatively related (e.g., Delta-Plus and Delta-Minus) while the theoretical model posited no linear relationships or higher negative associations. Furthermore, self-report measures are vulnerable to social desirability and acquiescence biases, and some people may use more extreme responses more frequently

(Schwartz, 2006), which might have impacted our results. However, as demonstrated in the analysis of the circumplex structure, despite these limitations, the CPM reproduced in accordance to the theoretical expectations.

Conclusions and future directions

The results of the present study lead us to a number of main conclusions. First, we support existing claims (Miller et al., 2017) that it is difficult to differentiate between Machiavellianism and psychopathy using only self-report measures. Therefore, there is a need to develop new measures, to clarify the difference between psychopathy and Machiavellianism. Second, measurement invariance studies, comparing adolescent and adult samples, are needed to address the question of whether these two age groups understand and respond to the the dark construct items in a similar manner. Third, we suggest that researchers studying the Dark Triad of personality should differentiate between the bright and the dark face of narcissism. We posit that the rivalry can be described as a purely dark trait, as it is characterized by antagonism, callousness, and low frustration tolerance; thus, it might be more theoretically justified to investigate it instead or in addition to general narcissism. However, despite claiming that admiration is the bright face of narcissism, we do not claim that it cannot become dark under certain social situations, as narcissistic individuals may become “dark” if they do not receive the praise and attention that they expect from others. Summarizing, this perspective does not only apply to future research on the Dark Triad, but also, creates an opportunity to reinterpret past results investigating narcissism.

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