



Dark Triad traits and their structure: An empirical approach

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Abstract

In the present research we investigated the structure of the Dark Triad of personality. On the basis of analyses performed on a broad spectrum of different items from different measures of traits usually included into the Dark Triad we provided support for the ideas that: (1) narcissism and the Dark Dyad are independent constructs; (2) it is possible to differentiate twelve meaningful dark facets in the pool of dark items from various measure of psychopathy, Machiavellianism and narcissism; (3) these facets could be organized within a hierarchical structure, which suggests that Machiavellianism as it is currently measured is an aspect of psychopathy in a similar manner as exhibitionism is an aspect of narcissism; (4) distinguished facets are organized in a theoretically predictable pattern of relations with basic personality traits and values, just as narcissism and the Dark Dyad are related to personality metatraits and higher order values.

Keywords Dark triad · Personality traits · Values

The Dark Triad of personality is a constellation of three socially aversive personality traits (narcissism, Machiavellianism and psychopathy; Paulhus and Williams 2002). Although research on the Dark Triad is flourishing (Furnham et al. 2013), little is known about the structure of the Dark Triad. As according to the Paulhus and Williams (2002), the Dark Triad traits were selected not on the basis of stringent criteria, but because they shared some commonalities such as social aversion, self-promotion, emotional coldness, and aggressiveness. Such a choice may be seen as intuitive but not exhaustive, which resulted in controversies on the number of dark traits within the constellation – are they the Dark Dyad, Triad, Tetrad or even a Tent?

The concept of the Dark Dyad assumes that Machiavellianism and psychopathy are closely related to each other and could be even treated as two facets of one construct. This hypothesis found support in different studies, where

narcissism was least correlated, excluded from the models, and with different criterion validity (Egan et al. 2014; Kowalski et al. 2016; Petrides et al. 2011; Rogoza and Cieciuch 2017). Exclusion of narcissism reflects the idea that psychopathy and Machiavellianism are closely related as psychopathy is theorized to be a broader construct that includes Machiavellianism with the addition of impulsivity and risk-taking (Glenn and Sellbom 2015).

On the other hand, some researchers argued that there are more than three dark traits, and the Dark Triad should be extended to include status-driven risk taking (Visser et al. 2014) or everyday sadism (Buckels et al. 2014). Paulhus (2014) pointed out the key features of the Dark Tetrad (including sadism), and the only common element between the Dark Triad and sadism was callousness, which suggests that each personality trait that could be described as callous is a potentially new dark trait. Marcus and Zeigler-Hill (2015) noticed the need to broaden the view of dark personality features and instead of investigating three or four traits as a one construct, they advocate that there is a Big Tent under which all dark traits (such as greed, spitefulness, perfectionism, dependency) could be classified.

These controversies regarding the number of dark traits raise the questions of whether Machiavellianism is a derivative of psychopathy, and is narcissism is conceptually separate from the Dark Triad. Are the Dark Triad or Tetrad a finished constellation of the dark traits? Do any other dark traits meet these inclusion criteria? The study reported in the present

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paper may not be exhaustive in answering these questions; however, it is intended to provide evidence pertinent to them by investigating the structure of a pool of items developed to measure psychopathy, Machiavellianism and narcissism.

Structure of Narcissism Narcissism, as a personality trait, was initially conceptualized as a unidimensional construct (Raskin and Hall 1979); however, more recent propositions posit that it is multidimensional. Two alternative models exist: a three-dimensional model proposed by Ackerman et al. (2011) and a two-dimensional model proposed by Back et al. (2013). Ackerman et al.'s (2011) model assumes the existence of adaptive (Leadership/Authority – self-perceived leadership abilities) and maladaptive (Grandiose Exhibitionism – self-absorption, vanity and exhibitionistic tendencies; and Entitlement/Exploitativeness – entitled beliefs and manipulative behaviors) aspects of narcissism. Within maladaptive narcissism, it is the Entitlement/Exploitativeness that is the socially toxic aspect, while Grandiose Exhibitionism has both negative and some positive aspects (Ackerman et al. 2011). The limitation of this model is the fact that it was developed on the basis of the Narcissistic Personality Inventory (NPI), a questionnaire designed by Raskin and Hall (1979), which was meant to reflect the DSM-III (APA 1980) narcissistic personality disorder diagnostic criteria. Moreover, the NPI is focused on the grandiose and assertive aspects of narcissism, while the aggressive and antagonistic aspects of narcissism are underrepresented.

The Narcissistic Admiration and Rivalry Concept (NARC; Back et al. 2013) overcomes this limitation by introducing a new theoretical model of narcissism. The NARC model assumes that the main aim of the narcissist is to maintain the grandiose self, which can be achieved through two strategies: self-enhancing admiration and self-defensive rivalry. The components of admiration may be divided into striving for uniqueness (affective-motivational), preoccupation with grandiose fantasies (cognitive) and charming behavior (behavioral aspect), whereas rivalry may be divided into striving for supremacy (affective-motivational), devaluation of others (cognitive) and aggressive behavior (behavioral aspect). Although admiration represents the socially positive strategy and rivalry represents the socially malevolent strategy, both remain positively correlated (Back et al. 2013; Rogoza et al. 2016a).

Structure of Machiavellianism Machiavellianism, unlike narcissism and psychopathy, does not have a clinical equivalent in either the DSM or ICD classifications. The trait Machiavellianism was named after Niccolò Machiavelli, who was a diplomatic senior official in Florentine Republic who wrote the book (*Il Principe*) in which he described how to be an effective ruler no matter at the cost. Machiavellianism is a personality trait that should characterize an efficient leader who is able to maintain his resources and privileges no matter

what the costs; thus, such a leader should be pragmatic, tactical, and strategic but also immoral, manipulative and cynical (Christie and Geis 1970; Jones and Paulhus 2009). The structure of Machiavellianism is somewhat unclear, and the following facets are usually differentiated: cynical worldview, manipulative tactics, amorality, lack of empathy, agentic motives, and self-enhancement (Christie and Geis 1970; Fehr et al. 1992; Jones and Paulhus 2009); however, the results from the study of Gu et al. (2017) suggest that only desire for control can be meaningfully differentiated from global Machiavellianism.

Rauthmann and Will (2011) consolidated existing knowledge and proposed a multifaced theoretical conceptualization of Machiavellianism, which is expressed in desires, cognition, affect, and behavior. Machiavellian desires represent self-interest (self-promoting and self-protecting), agentic orientations and impulse control; Machiavellian cognition can be divided into negative world view (e.g., cynicism, immorality) and view of people (e.g., suspiciousness, instrumentalism), specific strategies and egocentricity; and Machiavellian affect includes a low level of remorse and emotional detachment. The broadest aspect is Machiavellian behavior, which could be characterized as follows: anti-social tendencies, bistrategic tactics, self-beneficial and antagonistic behavior, detachment, exploitation and manipulation. Manipulation is one of the core elements of a Machiavellian personality, and can be further analyzed into more specific behavior patterns, such as tactical manipulation, presentation management, flexible adaptation, deceit and duplicity, concealment (agenda, imperfection, state or personality-related), and specific manipulative tactics such as emotional manipulation, ingratiation, persuasion, supplication, intimidation, dominance and power, or self-disclosure. The multifaceted conceptualization of Machiavellianism (Rauthmann and Will 2011; Rauthmann 2012) emphasizes that the structure of Machiavellianism is complex but it also emphasizes that its complexity is on a very specific hierarchical level that may be difficult to differentiate.

Structure of Psychopathy Hare and Neumann (2008) distinguished four dimensions of psychopathy: interpersonal (superficial charm, grandiose self-worth, pathological deception, and manipulative), affective (lack of remorse and empathy, shallow affect), antisocial conduct (poor behavioral control, criminal versatility, and juvenile delinquency), and lifestyle (stimulation seeking, impulsivity, and irresponsibility). Although this conceptualization was initially developed for clinical purposes, this four-factor psychopathy model (including: interpersonal manipulation, callous affect, erratic lifestyle, and antisocial behavior) was successfully adapted into personality assessment of community samples (Neal and Sellbom 2012; Paulhus et al. *in press*) and validated in different cultural contexts (e.g., Chegeni and Atari 2016). Hare and his colleagues also hypothesize two broader dimensions that

incorporate these four, one grouping together interpersonal manipulation and callous affect, and the other grouping together erratic lifestyle and antisocial behavior (Dębowska et al. 2014; Hare and Neumann 2008). These could be compared to the conceptualization of primary and secondary psychopathy (Karpman, 1941; Levenson et al. 1995). Primary psychopathy is characterized as callous, manipulative, selfish, and untruthful; secondary psychopathy is characterized as antisocial behavior under the influence of an emotional disorder, manifested by impulsivity (Levenson et al. 1995).

Another proposition of the psychopathy structure is the triarchic conceptualization proposed by Patrick et al. (2009), which encompasses three distinct phenotypic constructs: boldness, meanness, and disinhibition. Boldness represents interpersonal dominance, fearlessness, high self-confidence, and risk taking; meanness represents callousness, lack of empathy, deliberate cruelty, shallow emotionality, and exploitativeness; disinhibition represents general problems with impulse control, poor self-regulation and failure in delaying gratification (Brislin et al. 2015; Patrick et al. 2009).

The structure of psychopathy is closely related to Machiavellianism due to their theoretical overlap (Glenn and Sellbom 2015; Miller et al. 2017; Vize et al. *in press*); in the terminology of the multidimensional Machiavellianism model, both traits have similar affective characteristics (emotionally detached and low remorse) and similar behavioral characteristics (manipulation, exploitation, antagonistic and antisocial tendencies), which could differentiate these traits only at specific hierarchical level (e.g., specific manipulation tactics), similar cognitive characteristics (negative world and person view and egocentricity) but with different strategies, and similar desires (self-interest and agentic orientations) but with different impulse control abilities (Hare and Neumann 2008; Levenson et al. 1995; Neal and Sellbom 2012; Patrick et al. 2009; Rauthmann and Will 2011; Rauthmann 2012). Thus, the theoretical overlap between these two traits is high, and only the impulse regulation ability sufficiently differentiates these two traits (Glenn and Sellbom 2015; Jones and Paulhus 2011; Rogoza and Ciecuch 2017).

Relationship between the Dark Triad and Personality Traits and Basic Values

The Dark Triad is located within the personality structure; thus investigating its relations with the Big Five traits (McCrae and Costa 1997) or value preferences (Schwartz 1992), which are complementary, basic characteristics of personality (Ciecuch 2012; McCrae 2009) is especially helpful. Some existing studies suggest that there are many similarities in relations between particular Dark Triad traits and personality or value constructs. For example, each of the Dark Triad traits on both the basic and facet level is related to low agreeableness and a

strong preference for valuing power, achievement and hedonism (Balakrishan et al. 2017; DeShong et al. 2015; DeShong et al. 2017; Jonason et al. 2015; Kajonius et al. 2015; Krizan and Herlache 2017; Paulhus and Williams 2002; Rogoza et al. 2016a; Vernon et al. 2008). On the other hand, there are also some relations specific for some of the Dark Triad traits. For example, only narcissism tends to be related to extraversion and openness to experience traits, and self-direction and stimulation values, whilst psychopathy and Machiavellianism do not (Muris et al. 2017; O'Boyle et al. 2015; Rogoza et al. 2016a; Vize et al. *in press*). Although the relationship with neuroticism is not obvious, as the meta-analysis of Muris et al. (2017) provides support that the Dark Triad traits are uncorrelated with neuroticism, the study of DeShong et al. (2017) provided evidence that each of the Dark Triad traits are related to the angry hostility facet of neuroticism. Because personality traits have hierarchical structure, the relations were analyzed at a different level of the structure, including the level below the basic traits or values (McCrae and Costa 1997) and above the basic traits, the so called higher-order traits (Ciecuch and Strus 2017) or higher-order values (Schwartz et al. 2012). Also, it is worth noting that the Dark Triad traits, similarly to the basic personality traits can also adapt hierarchical structure, which makes such comparisons more meaningful; however, so far the empirical verification of the hierarchical structure was limited to narcissism as measured by the NPI (Ackerman et al. 2015).

Dark Triad's Structure – Brief Summary and Rationale for the Study

The Dark Triad traits do not have a simple unidimensional structure, and yet they are frequently reduced to a general score and analyzed in the context of variables of interest (Buckels et al. 2014; Jakobwitz and Egan 2006; Jonason and Kavanagh 2010; Jones and Paulhus 2011; Lee et al. 2012; Maples et al. 2014), which may lead to superficial and blurred results, especially because the structure of Machiavellianism and psychopathy theoretically overlap (Vize et al. *in press*). The Dark Triad of personality seems to be composed of narcissism and psychopathy, from which Machiavellianism could be differentiated on a more specific level; therefore, the triadic structure of this construct is questionable.

The Dark Triad has already successfully demonstrated its utility for personality researchers (e.g., the Dark Triad is systematically related to personality traits as agreeableness and honesty-humility, but also e.g., humor styles; Lee and Ashton 2005; Veselka et al. 2010), clinicians (e.g., the Dark Triad traits predicts subjective well-being and personality disorders; Aghababaei and Błachnio 2015; Miller et al. 2011) and even employers (e.g., the Dark Triad traits predict job performance

and counterproductive work behavior; DeShong et al. 2015; O'Boyle et al. 2012).

Despite the overlap between Machiavellianism and psychopathy (Glenn and Sellbom 2015; Vize et al. [in press](#)), these traits tend to explain some external variables in a slightly different manner. For example, only narcissism followed by Machiavellianism (the relation with psychopathy albeit significant was more than three times weaker) are associated with counterproductive behavior (DeShong et al. 2015; Jonason et al. 2014; O'Boyle et al. 2012). Moreover, each of the dark personalities seems to have different vocational interests (e.g., it is more likely to meet a psychopath in sales or it is less likely to meet Machiavellian in personal service; Kowalski et al. 2017).

Notwithstanding, the Dark Triad is commonly used in everyday empirical work (e.g., in explaining sexual strategies or financial behaviors (Jonason et al. 2015; Jones 2014), while the understanding of its structure is only partial and mostly limited to single measures (e.g., Persson et al. 2017; Savard et al. 2017). Therefore, better understanding of how the Dark Triad traits are organized in multi-scale context will enhance the utility of this model. More specifically, we expect that the additional knowledge and understanding of the structure of the Dark Triad traits will allow for making more precise predictions for the researchers (owing to the knowledge of the dependencies between the dark traits), more valid diagnoses for the clinicians (owing to the understanding of the underlying hierarchical nature), and the more accurate judgments for the employers (owing to the differentiation of more specific facets). The significance of the present study is therefore broad and important, as the scrutinizing of the Dark Triad structure in an empirical approach can provide a datum point for the wide audience of researchers and practitioners.

Current Study

Decades of research on the dark traits (Christie and Geis 1970; Raskin and Hall 1979) resulted not only in development of new scales, but more importantly it resulted in the development of a broad spectrum of indicators of these traits, that is, items measuring them. However, so far research on the Dark Triad structure was limited to a single measure, and thus studied the structure of the given measurement model and not the structure of the construct. In the current study, we investigate the Dark Triad's structure by using as broad spectrum of dark personality items originating from different, most frequently used measures (i.e., the NPI, the MACH-IV and the LSRP) as possible, which overcomes the limitations of the existing single measurement models (e.g., SD3; Jones & Paulhus, 2014) and allows for complex analysis of the phenomenon.

The scale-level analyses show how different dark traits measured by different instruments are related to each other,

whereas item-level analyses allow for taking into account the overlap between scales and start a step before measurement established Dark Triad constructs. This can provide information about what the scales of interest really measure because the item is the most basic element of self-report assessment, a direct stimulus, whereas the scale represents an indirect applied interpretation of a previously selected set of items. For this purpose, we decided to use four questionnaires which represent the entirety of dark traits indicators: the SD3 questionnaire that captures all Dark Triad traits, and three standard measures that assess each of the traits independently.

Firstly, we hypothesized that the three-factor structure of the Dark Triad on the scale-level would not be confirmed due to high theoretical overlap of Machiavellianism and psychopathy. Secondly, we hypothesized that it is possible to differentiate a set of meaningful dark traits (factors) in the Dark Triad item pool. Thirdly, we assumed that these traits could be organized within a meaningful hierarchical structure. Finally, we examined the validity of the distinguished factors by investigating their relationships with personality traits and basic values. The validity analyses were carried out in correspondence to the theoretical level of variables, i.e., dark traits from the bottom of hierarchy were related with basic personality traits and values, whereas dark higher-order factors from the top of the hierarchy were related with personality metatraits and higher order values.

Material and Methods

Participants and Procedure

The study was conducted online and was accessible only via direct link, which was sent to individual respondents using a social networking site (Facebook). It was especially advertised on a range of local community and student groups. The study advertisement was accessed by 2503 individuals among which 1856 has started the survey. A total of $n = 844$ participants did not finished the started survey as the mean time of completion took approximately 40 min. The final sample therefore comprised 1012 Polish participants between 17 and 35 years of age. In the overall sample, there were 202 male ($M = 22.28$; $SD = 3.26$) and 810 female participants ($M = 22.38$; $SD = 3.49$). All of the participants were informed that the study was anonymous; however, every participant had an opportunity to provide his or her e-mail address in order to participate in a lottery to win a book as a reward for participating in the study.

Measures

Measurement of the Dark Triad Traits To measure the Dark Triad traits we used the 27-item SD3 (Jones & Paulhus,

2014; Polish adaptation: Rogoza and Ciecuch 2017), which measures narcissism, Machiavellianism and psychopathy simultaneously. Respondents rate their agreement using Likert type scale ranging from one (*strongly disagree*) to five (*strongly agree*). Additionally each trait was measured independently in more detail: primary and secondary psychopathy using the 26-item LSRP (Levenson et al. 1995; Polish translation made by the authors with the permission and in correspondence with the author of the scale) on which respondents rate their agreement using Likert type scale ranging from one (*disagree strongly*) to four (*agree strongly*), Machiavellian personality using the 20-item MACH-IV (Christie and Geis 1970; Polish translation: Pospiszyl 2000), on which respondents also use Likert type scale ranging from one (*disagree strongly*) to seven (*agree strongly*), and narcissistic leadership, vanity, admiration and self-efficacy using the 34-item NPI (Raskin and Hall 1979; Polish adaptation: Bazińska and Drat-Ruszczak 2000) on which respondents rate how much each statement describes them using Likert type scale from one (*it's not me*) to five (*it's me*). Summing up, we used a total pool of 107 different items measuring different aspects of the Dark Triad. The descriptive statistics and reliability estimates of the Dark Triad traits are presented in Table 1.

Measurement of other Variables Within the current study we also measured two major complementary characteristics of one's personality. Specifically, we measured the Big Five traits (extraversion, emotional stability, conscientiousness, intellect and agreeableness using the IPIP-50 (Goldberg 1999; Polish adaptation: Strus et al. 2014a) and

Table 1 Descriptive statistics and reliability estimates of the measures of the Dark Triad

	<i>M</i>	<i>SD</i>	α
Psychopathy			
Psychopathy (SD3)	2.14	0.54	.67
Primary psychopathy (LSRP)	1.92	0.50	.86
Secondary psychopathy (LSRP)	1.86	0.42	.61
Machiavellianism			
Machiavellianism (SD3)	3.08	0.61	.73
Machiavellianism (MACH-IV)	3.83	0.75	.84
Narcissism			
Narcissism (SD3)	2.85	0.57	.73
Leadership (NPI)	2.84	0.82	.89
Vanity (NPI)	2.86	0.92	.79
Admiration (NPI)	2.71	0.79	.87
Self-efficacy (NPI)	3.40	0.71	.77

SD3, Short Dark Triad; LSRP, Levenson Self-Report Psychopathy Scale; NPI, Narcissistic Personality Inventory

the nineteen basic values distinguished within the refined theory of values using the PVQ-57 (Schwartz et al. 2012; Polish adaptation: Ciecuch 2013): achievement, hedonism, stimulation, self-direction in action, self-direction in thought, universalism-tolerance, universalism-nature, universalism-concern, benevolence-caring, benevolence-dependability, humility, conformity-interpersonal, conformity-rules, tradition, security-societal, security-personal, face, power-resources, power-dominance (Table 2).

Statistical Procedure

The first hypothesis regarding the structure of the Dark Triad on the scale-level was tested using the confirmatory variant of Exploratory Structural Equation Modeling (ESEM; Asparouhov and Muthén 2009) in which we compared three models: (1) a model in which all Dark Triad scales were hypothesized to load onto a single latent factor; (2) a model in which scales capturing narcissism were expected to load onto one factor and scales capturing Machiavellianism and psychopathy loading onto another

Table 2 Descriptive statistics and reliability estimates of the measures of the personality traits and basic values

	<i>M</i>	<i>SD</i>	α
Personality traits			
Extraversion	3.11	0.87	.91
Emotional stability	2.64	0.81	.89
Conscientiousness	3.36	0.72	.84
Intellect	3.74	0.58	.80
Agreeableness	3.93	0.60	.84
Basic values			
Achievement	4.56	0.97	.71
Hedonism	4.71	0.87	.73
Stimulation	3.84	1.11	.75
Self-direction in action	5.01	0.85	.78
Self-direction in thought	4.87	0.91	.74
Universalism-tolerance	4.62	1.05	.79
Universalism-nature	3.87	1.22	.88
Universalism-concern	4.62	1.06	.79
Benevolence-caring	5.13	0.83	.78
Benevolence-dependability	5.22	0.78	.79
Humility	3.74	1.05	.58
Conformity-interpersonal	3.71	1.21	.86
Conformity-rules	3.92	1.18	.85
Tradition	3.98	1.33	.87
Security-societal	4.54	1.20	.90
Security-personal	4.51	0.92	.63
Face	4.52	1.00	.72
Power-resources	3.13	1.23	.84
Power-dominance	2.37	1.13	.84

factor; and (3) a model in which each respective scale was expected to load on corresponding factor (e.g., narcissistic scales were expected to load on narcissism factor, psychopathy scales on the psychopathy factor and Machiavellianism scales on the Machiavellianism factor). The confirmatory variant of ESEM with the target rotation allows for targeting which loadings should be as close to zero as possible and which loadings should be freely estimated (Marsh et al. 2014). To evaluate whether the model fit the data, we used the following model fit indicators: the Comparative Fit Index (CFI) and Standardized Root Mean Square Residuals (SRMR); and the χ^2/df ratio, since using χ^2 in large samples almost always results in a significant fit (Kline 2011). Hu and Bentler (1999) suggested a cutoff value for CFI above .90, while Browne and Cudeck (1993) suggested a cutoff value for SRMR less than .06, while the value of the χ^2/df ratio should be <2. However those “golden rules” should be interpreted with caution since they are nothing more than “rules of thumb” (Marsh et al. 2004).

The second hypothesis regarding differentiation of meaningful dark traits in the Dark Triad item pool was tested using the exploratory variant of ESEM with oblique geomin rotation. We decided to explore the Dark Triad structure as we did not have any theoretical predictions regarding lower-order structure. We explored the structure by comparing which of the competing models is best fitted to the data and explains the most information. In addition to the approximate model fit indicators described above, we used the Bayesian Information Criterion (BIC); the model with the lowest value of BIC is preferred (Nylund et al. 2007).

The third hypothesis regarding the hierarchical organization of the distinguished dark traits was tested using Goldberg’s (2006) top down proposition: we extracted the factor scores from several ESEM analyses with an increasing number of factors, and correlated them level by level; that is, the factor score from the single factor model was correlated with factor scores from the two factor model; the factor scores from the two factor model were correlated with factor scores from the three factor model, and so on.

Finally, we examined the relationships between distinguished dark traits with personality traits and values. We (1) correlated the constructs (dark traits, personality traits and values) by using two-tailed Pearson’s r coefficient and (2) exploratory factor analysis with varimax rotation to see if they group into meaningful factors. Additionally, we also correlated the traits from the top of the Dark Triad hierarchy with constructs on their corresponding level of theoretical complexity (i.e., metatraits of personality and higher order values, which was also tested using two-tailed correlations).

Results

Structure of the Dark Triad Traits

Scale Level To test the structure of the Dark Triad as measured by different Dark Triad instruments, we conducted three ESEM models (ranging from one to three factors) with target rotation and robust maximum likelihood estimation. Each loading that was not expected to load on a given factor was targeted to be close to 0.

Although all scales were significantly loading in the single factor model, it was poorly fitted to the data ($\chi^2_{(9)} = 974.85$; $p < .001$; CFI = .672; SRMR = .127). The three-factor Dark Triad model did not converge, whereas the two-factor narcissism and Machiavellianism-psychopathy model presented in Table 3 was excellently fitted to the data ($\chi^2_{(4)} = 33.66$; $p < .001$; CFI = .990; SRMR = .014).

All scales measuring narcissism grouped within one factor, and all scales measuring Machiavellianism and psychopathy grouped within another factor and the cross-loadings did not exceed a value of .07, confirming our hypothesis. Within the Dark Triad of personality, it is impossible to sufficiently differentiate Machiavellianism and psychopathy on a general level.

Item Level To differentiate dark facets within the pool of “dark items,” we ran competing ESEM models (varying in the number of factors) with oblique geomin rotation on items from all measures used. To decide which model best reproduced the structure, we relied on approximate model fit indices (CFI and SRMR) and BIC. Model fit indices of competing ESEM models are presented in Table 4.

Regarding SRMR, all models, starting from the two-factor model was well fitted to the data. The CFI value reached an acceptable level in the thirteen factor model, whereas the BIC was lowest for the twelve factor model. Because the twelfth model explained the most information, and the value of CFI was at the boundary of acceptable model fit, we decided to choose this model over all other competing models for further analyses. Thus, it could be concluded that the “dark items” were best represented by twelve distinct facets.

The standardized factor loadings, item content and the intercorrelations of the twelve-factor Dark Triad model are presented within the Appendix. Summarizing, we distinguished factors as follows: (1) impulsive revengefulness, (2) law of jungle rivalry, (3) ingratiate manipulation, (4) leadership/authority, (5) grit, (6) grandiosity, (7) admiration, (8) foolhardiness, (9) grandiose fantasies, (10) compliance with rules, (11) exhibitionism, (12) suspiciousness. The 5th and 10th facets consist of reversed items, and therefore form positive rather than dark traits as will be discussed below.

Table 3 Standardized factor loadings of targeted Exploratory Structural Equation model of the Narcissism and Dark Dyad

Scale	Narcissism	Machiavellianism-psychopathy (Dark Dyad)
Narcissism (SD3)	.91	-.06
Narcissism (NPI)	.88	.07
Machiavellianism (SD3)	.02	.76
Machiavellianism (MACH-IV)	-.06	.77
Psychopathy (SD3)	.07	.70
Psychopathy (LSRP)	-.02	.89

SD3, Short Dark Triad; NPI, Narcissistic Personality Inventory; LSRP, Levenson Self-Report Psychopathy Scale

Hierarchical Structure of the Dark Triad

To test whether distinguished facets of the Dark Triad compose a hierarchical structure, we followed the procedure proposed by Goldberg (2006). This analysis allows us to see on which level each facet is differentiated from the other facets. For example, the exhibitionism facets emerge on the 8th level of the hierarchical structure from grandiosity, which means that grandiosity is a broader construct and contains exhibitionism. The hierarchical structure of the Dark Triad is presented in Fig. 1.

From a more general perspective, narcissism is differentiated from the Dark Triad on the second level, whereas Machiavellianism and psychopathy could not be sufficiently differentiated until the 9th level. Thus, it could be concluded that narcissism disentangles from other constructs of the Dark Triad at the highest possible level in the hierarchy, whereas the differentiation between Machiavellianism and psychopathy is troublesome, since they share many characteristics; therefore, it seems to be justified to interpret narcissism and the Dark Dyad as independent constructs.

From a more specific perspective, narcissism at the beginning disentangled into leadership/authority and grandiosity. Whereas leadership/authority did not differentiate on lower levels, grandiosity divided into several additional aspects: admiration, grandiose fantasies, and exhibitionism. The Dark Dyad began its differentiation on the 5th level, where primary and secondary psychopathy emerged; however, clear differentiation is possible on the 9th level, where impulsive revengefulness as a distinct indicator of psychopathy and ingrativative manipulation as a distinct indicator of Machiavellianism emerged. In the end, two additional distinct facets emerged: suspiciousness for Machiavellianism on the 10th level and foolhardiness for psychopathy on the 11th level. It is difficult to differentiate between these traits because they share some common characteristics, and even on the 12th level of the Dark Triad’s hierarchy, the differentiation in the law of jungle rivalry was troublesome. During the analyses, two positive facets emerged: grit (which is interpreted as long-term goal perseverance; Duckworth et al. 2007) and compliance with rules. The presence of positive facets is due to the reversed items included in analyses, thus, they should be interpreted reversely. Grit emerged on

Table 4 Model fit indices of competing exploratory structural equation models of the Dark Triad

Number of factors	χ^2 (df)	<i>p</i>	χ^2/df	CFI	SRMR	BIC
1	28,325.60 ₍₅₅₆₄₎	.001	5.09	.403	.091	320,551.99
2	21,271.33 ₍₅₄₅₈₎	.001	3.90	.585	.058	313,750.97
3	18,967.75 ₍₅₃₅₃₎	.001	3.54	.643	.050	311,726.53
4	16,564.66 ₍₅₂₄₉₎	.001	3.16	.703	.045	309,972.49
5	14,756.34 ₍₅₁₄₆₎	.001	2.87	.748	.039	308,756.28
6	13,331.96 ₍₅₀₄₄₎	.001	2.64	.783	.036	307,919.22
7	12,361.47 ₍₄₉₄₃₎	.001	2.50	.805	.034	307,493.31
8	11,320.97 ₍₄₈₄₃₎	.001	2.34	.830	.032	307,101.54
9	10,885.88 ₍₄₇₄₄₎	.001	2.30	.839	.030	306,920.85
10	9765.91 ₍₄₆₄₆₎	.001	2.10	.866	.027	306,736.99
11	9126.11 ₍₄₅₄₉₎	.001	2.01	.880	.026	306,687.34
12	8411.46 ₍₄₄₅₃₎	.001	1.89	.896	.024	306,666.24
13	8035.21 ₍₄₃₅₈₎	.001	1.84	.904	.023	306,849.80

First acceptable values were bolded

CFI, comparative fit index; SRMR, standardized root mean square residual; BIC, Bayesian Information Criterion

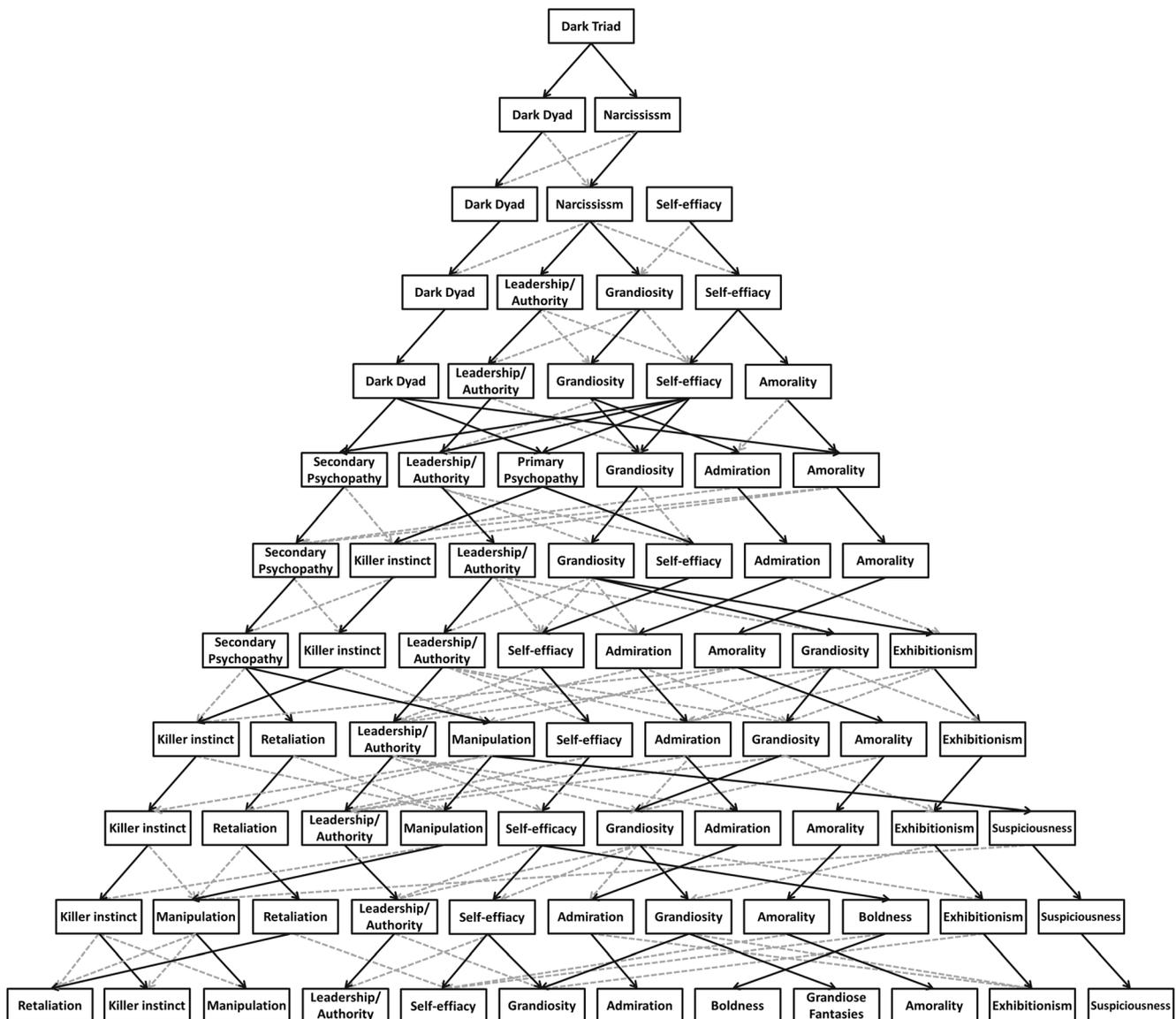


Fig. 1 Hierarchical structure of the Dark Triad. Arrows represents significant correlations between facets larger than .40. Strongest correlations were bolded. Narcissism and its facets were greyed

the third level and compliance with rules followed on the fifth level. Grit is somewhat present in all Dark Triad traits on some level, and is a primary trait for psychopathy’s foolhardiness facet. Compliance with rules mostly is associated with Machiavellianism and psychopathy, with limited interaction with narcissism. Summarizing, the Dark Triad’s twelve facets could be arranged within a hierarchical structure, where narcissism-related facets are quite independent from Machiavellianism and psychopathy and disentangled on the higher levels, whereas Machiavellianism and psychopathy shares many characteristics; thus, their differentiation is only possible closer to the bottom of the structure. Such a hierarchical structure puts into doubt current conceptualizations of the Dark Triad of personality, where narcissism, Machiavellianism, and psychopathy are assumed to be structurally equivalent traits.

Relationships of the Dark Triad Facets with Personality Traits and Basic Values

Bottom Level of the Hierarchy The Pearson correlation coefficients between the twelve distinguished facets of the Dark Triad with personality traits and basic values are presented in Table 5.

In regard to personality traits, only facets of narcissism (leadership/authority, grandiosity, and admiration) correlated with extraversion and among these, leadership/authority and grandiosity additionally correlated with intellect. Among the Dark Dyad facets, they were only related to low agreeableness; however, grit was positively related to both conscientiousness and emotional stability, which could be interpreted reversely due to item wording.

Table 5 Relationships between Dark Triad facets and personality traits and basic values

	E	A	C	S	I	AC	HE	ST	SDA	SDT	UNT	UNN	UNC	BEC	BED	HU	COI	COR	TR	SES	SEP	FAC	POR	POD
Impulsive revengefulness	.09	-.33	-.15	-.28	.08	.15	.20	.25	.14	.13	-.28	-.01	-.24	.02	-.10	-.16	-.43	-.24	-.11	-.01	-.10	.15	.24	.36
Law of jungle rivalry	.07	-.49	.00	.05	.01	.30	.24	.29	.12	.04	-.36	-.12	-.51	-.24	-.32	-.35	-.24	-.18	-.15	-.12	.02	.17	.57	.52
Ingratiation manipulation	.03	-.28	-.14	-.05	.11	.18	.25	.23	.09	.08	-.19	-.09	-.32	-.11	-.17	-.23	-.24	-.30	-.18	-.07	-.06	.24	.33	.42
Foolhardiness	.20	-.10	-.22	.21	.23	.07	.18	.42	.28	.29	.04	.14	-.07	-.02	-.04	-.10	-.24	-.31	-.20	-.07	-.44	-.19	.06	.21
Compliance with rules	-.08	.40	.21	-.16	.06	-.25	-.23	-.16	-.19	-.09	.15	.06	.36	.13	.14	.24	.24	.35	.29	.13	.08	-.17	-.44	-.49
Suspiciousness	-.19	-.33	-.10	-.15	.04	.11	.11	.04	.21	.24	-.17	-.07	-.22	-.01	-.05	-.12	-.21	-.19	-.25	.03	.03	.22	.20	.19
Grit	.26	.26	.53	.40	.28	.18	-.08	.02	.19	.15	.06	.02	.03	.08	.10	-.11	-.10	.15	.16	.06	-.04	-.22	-.20	-.23
Leadership/authority	.61	.01	.16	.23	.38	.32	.11	.31	.26	.22	-.18	.01	-.25	-.04	-.07	-.35	-.40	-.16	-.08	-.02	.23	-.05	.19	.37
Grandiosity	.40	.00	.18	.28	.48	.37	.14	.28	.32	.29	-.15	.03	-.25	-.07	-.12	-.40	-.36	-.17	-.12	.00	-.16	.03	.15	.24
Admiration	.62	.09	-.07	.06	.18	.35	.23	.30	-.01	-.06	-.10	-.06	-.20	-.04	-.10	-.33	-.18	-.23	-.05	-.08	-.15	.12	.25	.25
Grandiose fantasies	.16	-.02	.02	-.11	.24	.44	-.02	.08	-.02	-.05	-.22	-.08	-.20	-.16	-.16	-.34	-.08	-.12	-.04	.03	-.08	.17	.34	.29
Exhibitionism	.27	-.06	-.03	.17	.13	.23	.20	.17	.05	.00	-.09	.00	-.14	-.07	-.17	-.28	-.16	-.18	-.09	-.01	-.11	.07	.26	.19

The means of basic values scales were centered

Correlations larger than .30 were bolded

E, Extraversion; A, Agreeableness; C, Conscientiousness; S, Emotional Stability; I, Intellect; AC, Achievement; HE, Hedonism; ST, Stimulation; SDA, Self-direction-action; SDT, Self-direction-thought; UNT, Universalism-tolerance; UNN, Universalism-nature; UNC, Universalism-concern; BEC, Benevolence-caring; BED, Benevolence-dependability; HU, Humility; COI, Conformity-interpersonal; COR, Conformity-rules; TR, Tradition; SES, Security-societal; SEP, Security-personal; FAC, Face; POR, Power-resources; POD, Power-dominance

Among all of the measured Dark Triad facets, three of them were not related to any personality trait: foolhardiness, grandiose fantasies, and exhibitionism.

In regard to basic values, preference for Achievement was related to law of jungle rivalry and with most of the narcissism facets, including grandiose fantasies, which was not related to any personality trait. The Stimulation value was related to the two narcissism facets: leadership/authority and grandiose fantasies, but also with a facet of psychopathy, foolhardiness. The values which were related to only one of the distinguished facets are Self-direction in action, related to grandiosity; Universalism – Tolerance and Benevolence – dependability, related to the law of jungle rivalry; and Security – personal, related to foolhardiness. Universalism – concern and Conformity – rules were related only to the Dark Dyad's facets – ingratiation manipulation, and compliance with rules related to both values, and law of jungle rivalry related Universalism – concern, and foolhardiness related to Conformity - rules. The value of Humility was related mostly to narcissism facets, including leadership/authority, grandiosity, admiration, and grandiose fantasies, but also to law of jungle rivalry. The Conformity-interpersonal value was related to impulsive revengefulness, leadership/authority, and grandiose fantasies. Both Power values were rather related to the Dark Dyad's facets: law of jungle rivalry, ingratiation manipulation, and compliance with rules; Power-resources was additionally related to grandiose fantasies, whereas Power-dominance was additionally related to leadership/authority. Among all of the facets, only three of them were not related to any of the measured value preferences, i.e., grit, exhibitionism, and suspiciousness.

To test the mutual relationship between dark facets, personality traits and basic values, we additionally ran an exploratory factor analysis with varimax rotation. The investigation of the scree plot's break suggested extraction of the three factors explaining 43.20% of the variance. The results are presented in Table 6.

We found that that amongst the three distinguished factors, the first one represented what is bright in the measured characteristics, whereas the remaining two factors demonstrated two distinct tones of darkness. The first one represents agentic narcissism, a dark characteristic involving craving for attention and glory (as expressed by achievement preference), self-focus (as expressed by power-dominance), and constantly exploring the social environment to lure new prey (as expressed by extraversion, intellect, stimulation and self-direction); the second factor represents the malevolent psychopathic type, a dark personality, which cares the most about power and does not care what others think about them, whether good or bad (as suggested by its negative relations with universalist values and agreeableness).

Additionally, we repeated this procedure, replacing dark facets with the original scales. Similarly, three factors were extracted

Table 6 Rotated factor loadings of the dark triad facets, personality traits and the basic values

	F1	F2	F3
Dark facets			
Impulsive revengefulness	-.16	.10	.46
Law of jungle rivalry	-.21	.11	.68
Ingratiation manipulation	-.16	.09	.55
Leadership/Authority	-.08	.68	.21
Grit	.30	.43	-.20
Grandiosity	-.02	.67	.24
Admiration	-.09	.43	.24
Foolhardiness	-.35	.41	-.07
Grandiose fantasies	.09	.24	.47
Compliance with rules	.67	-.05	-.20
Exhibitionism	-.10	.33	.25
Suspiciousness	-.15	-.07	.34
Personality traits			
Neuroticism	.14	-.39	.21
Extraversion	.01	.65	.06
Intellect	.12	.59	.04
Agreeableness	.51	.23	-.46
Conscientiousness	.33	.33	-.06
Basic values			
Achievement	.36	.51	.44
Hedonism	.29	.39	.27
Stimulation	.18	.54	.22
Self-direction in action	.30	.57	.12
Self-direction in thought	.29	.51	.05
Universalism-tolerance	.52	.16	-.34
Universalism-nature	.39	.19	-.06
Universalism-concern	.68	.03	-.35
Benevolence-caring	.61	.23	-.11
Benevolence-dependability	.68	.24	-.13
Humility	.50	-.21	-.33
Conformity-interpersonal	.57	-.23	-.16
Conformity-rules	.66	-.08	-.10
Tradition	.58	.03	-.06
Security-societal	.54	.11	.06
Security-personal	.65	-.12	.19
Face	.44	.02	.48
Power-resources	-.03	.18	.71
Power-dominance	-.18	.30	.64

Factor loadings > .30 were bolded

according to the scree plot, which explained 48.12% of the variance. The rotated factor loadings are presented in Table 7.

The obtained results on the original scales replicated the facet level findings, specifically that there are two, distinct dark types: one self-enhancing and opened for change, and the second also self-enhancing but also antagonistic.

Table 7 Rotated factor loadings of the dark triad scales, personality traits and the basic values

	F1	F2	F3
Dark scales			
SD3 Narcissism	.81	-.10	.14
NPI Admiration	.68	-.09	.38
NPI Leadership	.82	-.10	.23
NPI Vanity	.56	-.08	.15
NPI Self-efficacy	.76	.07	.05
SD3 Psychopathy	.19	-.28	.61
LSRP Primary psychopathy	.28	-.36	.71
LSRP Secondary psychopathy	-.24	-.16	.53
SD3 Machiavellianism	.17	-.13	.71
MACH-IV	.13	-.06	.56
Personality traits			
Neuroticism	-.38	.15	.30
Extraversion	.64	.01	-.05
Intellect	.55	.14	-.01
Agreeableness	.13	.52	-.46
Conscientiousness	.28	.26	-.23
Basic values			
Achievement	.58	.34	.27
Hedonism	.37	.34	.28
Stimulation	.50	.23	.24
Self-direction in action	.53	.34	.10
Self-direction in thought	.46	.34	.06
Universalism-tolerance	.06	.56	-.29
Universalism-nature	.15	.41	-.05
Universalism-concern	-.07	.70	-.29
Benevolence-caring	.17	.63	-.08
Benevolence-dependability	.17	.72	-.11
Humility	-.29	.51	-.22
Conformity-interpersonal	-.23	.54	-.17
Conformity-rules	-.04	.59	-.19
Tradition	.05	.54	-.12
Security-societal	.12	.54	.04
Security-personal	-.04	.59	.10
Face	.11	.43	.40
Power-resources	.32	-.05	.56
Power-dominance	.41	-.18	.54

Factor loadings > .30 were bolded

SD3, Short Dark Triad; NPI, Narcissistic Personality Inventory; LSRP, Levenson Self-Report Psychopathy Scale

Top Level of the Hierarchy In order to summarise the relations between more narrowly defined dark facets, values and traits we also tested relations between dark traits differentiated at the top level of the hierarchy and variables on a similar level (i.e., personality metatraits and higher order values). The Pearson correlation coefficients between narcissism and the Dark Dyad with personality metatraits and higher-order values are presented in Table 8.

Whereas the pattern of relationship between the Dark Dyad, narcissism, and higher-order values were similar; that is both traits are positively related to openness to change and negatively with conservation, but the Dark Dyad is more related to self-enhancement and less to self-transcendence than narcissism. The differences emerged in the relationships of the Dark Dyad and narcissism with personality metatraits: the

Table 8 Relationships between narcissism, Dark Dyad and personality metatraits and higher-order values

	Narcissism	Dark Dyad
Plasticity	.70	.05
Stability	.19	-.31
Conservation	-.49	-.52
Openness to change	.40	.36
Self-transcendence	-.29	-.50
Self-enhancement	.49	.66

The means of higher-order values scales were centered

Dark Dyad was unrelated whereas narcissism was strongly related with Plasticity; and the Dark Dyad was negatively related and narcissism positively related with Stability. These results confirm that on a scale level, differentiation between the Dark Dyad and narcissism is possible. Whereas their motivation may be common to some extent, their personality significantly differs.

Discussion

The main aim of the current paper was to scrutinize the structure of the Dark Triad, which was done on several different theoretical and empirical levels using a broad spectrum of the Dark Triad traits indicators. What is novel about our paper is the applied procedure of treating the problem as most of the existing research is done on items of a specific scale (e.g., the NPI; Ackerman et al. 2011, or SD3; Atari and Chegeni 2016), which limits the conclusions just to the used scale. We generalized the very same procedure to all of the multiple independent forms of Dark Triad trait measurements. Of course, we are still locked in the initial pool of items, which was not finite, but the construct coverage seems to be far deeper than in research using single scales.

We provided evidence that the structure of the Dark Triad as currently measured by existing instruments is not necessarily triarchic but rather dyadic, both on the scale- and item-level. It turned out that within the Dark Triad a total of twelve facets, which are organized in a hierarchical structure, could be distinguished. Differentiated facets presented distinct relations with personality traits and basic values, and likewise dark metatraits did with personality metatraits and higher order values.

Our results are consistent with the most recent arguments indicating that Machiavellianism as it is currently measured is indistinct from psychopathy (Glenn and Sellbom 2015; Miller et al. 2017; Vize et al. in press). On the scale level, we were able to distinguish two factors, narcissism and the Dark Dyad (a combination of items measuring both psychopathy and

Machiavellianism which were not distinguishable on the basis of statistical criteria). These results suggested that narcissism is quite independent from the construct of the Dark Dyad, whereas the latter share some more specific elements which we investigated in more detail on the item-level.

On the basis of comparison of competing structural models of the Dark Triad, we identified a total of twelve distinct facets. Five facets related to narcissism were as follows: (1) leadership/authority, which reflects self-perceived leadership abilities and is reflected as one of the narcissism factors within Ackerman et al.'s (2011) model; (2) grandiosity, which reflects the core features of narcissism (e.g., self-absorption and superiority), and is reflected as a component of the grandiose exhibitionism factor in Ackerman et al.'s (2011) model; (3) admiration, which reflects the need to show off and be the center of attention, which is perceived as a distinct and socially potential narcissistic strategy within the NARC model (Back et al. 2013); (4) grandiose fantasies, which reflects exaggerated thoughts about being special and unique; within the NARC model, grandiose fantasies are assumed to be the cognitive component of the narcissistic admiration strategy; (5) exhibitionism, which reflects confidence with one's body and the tendency to exhibit it in order to be admired, which is a specific facet that was extracted from Ackerman et al.'s (2011) grandiose exhibitionism factor. Similarly to narcissism, five facets of the Dark Dyad were distinguished: (1) impulsive revengefulness, which represents the tendency to retaliate, and impulsive behaviors, which could be interpreted in terms of antisocial tendencies and disinhibition (Patrick et al. 2009); (2) law of jungle rivalry, which represents selfishness and callousness, is similar in conceptualization to primary psychopathy (Levenson et al. 1995); (3) ingratiation manipulation, which represents a specific strategy of manipulation, is listed as one of the Machiavellian tactics (Rauthmann 2012); (4) foolhardiness, which represents diminished fear capacity and stimulation seeking, could be compared to one of Patrick et al.'s (2009) components of psychopathy (boldness); and (5) suspiciousness, which represents distrust towards other people and negative views of people, and is present in both Machiavellianism and psychopathy (Hare and Neumann 2008; Rauthmann and Will 2011). Finally, two positively worded facets were also differentiated: (1) grit, which represents (lack of) perseverance towards long-term goals (Duckworth et al. 2007) in both narcissism and psychopathy; and (2) compliance with rules, which represents the (lack of) morality, conformism and obedience to authorities and rules, which was a facet composed of items measuring psychopathy and Machiavellianism.

As a next step, we assessed how these facets are organized within a hierarchical structure, namely, which of these are more general constructs from which more specific facets emerge. Our results indicated that from the top of the hierarchy, narcissism and the Dark Dyad differentiate from one another. The most basic differentiation of narcissism is on leadership/authority

and grandiosity. Grandiosity further divides into admiration, exhibitionism, and grandiose fantasies. The Dark Dyad starts to divide into primary and secondary psychopathy on the very same level as admiration could be differentiated from grandiosity. Furthermore, when the facet typical for Machiavellianism emerges, (ingratiation manipulation) simultaneously, on the same level within narcissism, exhibitionism divided from grandiosity. Because Machiavellianism and psychopathy could not be differentiated until later than exhibitionism is differentiated from grandiosity in narcissism, it is thus not theoretically justified to put Machiavellianism in alignment with narcissism and psychopathy as three traits constituting the Dark Triad.

The pattern of relationships of differentiated facets with basic personality traits and values revealed another set of differences between narcissism and the Dark Dyad. Narcissistic facets were most strongly related to extraversion and slightly with intellect, whereas the Dark Dyad was most strongly related to low agreeableness, which is a typical result (e.g., Hare and Neumann 2008). Narcissists are often described as disagreeable extraverts (Paulhus, 2001); however, in the current study we did not find support for the relation with disagreeableness. This is most likely related to the imperfect measurement of narcissism, as in the current study we missed many antagonistic aspects of narcissism, which are essentially related to disagreeableness (Rogoza et al. 2016a). The main motivation of the narcissist, who characterize themselves with high social desirability (Kowalski et al. 2018), was the need to pursue achievements and the lack of humility, whereas the main motivation of psychopaths was the lack of respect toward rules and power. These are also consistent with other findings throughout the literature (Kajonius et al. 2015; Rogoza et al. 2016a). In terms of the relation of narcissism and the Dark Dyad to the personality metatraits and higher order values, it turned out that their motivation is similar; however, its realization proceeds via different means: plastic in narcissism and unstable in the Dark Dyad. Similarly to the relation with basic traits, narcissists were described as presenting not only plastic behaviors but unstable ones as well (Rogoza et al. 2016b), which we believe also resulted from too few items measuring the antagonistic aspects of narcissism.

We found out that the dark personalities could be divided into two distinct tones; the first being focused on constant exploiting and demanding admiration from the social environment for as long as possible, followed by exploration to find other people who do not know them yet whenever the pool of social resources is drying up. Such a description is closely related to Paulhus's (1998) description of the narcissistic individual within a group as someone who is initially perceived as agreeable, competent, and well-adjusted, but within only a few weeks is judged in the opposite manner. Such results are also found in more recent studies suggesting that narcissists make good first impressions, especially at the moment of zero acquaintance, but after time passes and their flaws become more salient and their true dark nature repels other people

(Back et al. 2010; Leckelt et al. 2015; Rogoza et al. 2016b). The second tone of darkness represents pure antagonism; in other words, a complete lack of respect towards social norms, morality, tradition, and other people in general. As this type subsumes facets of both psychopathy and Machiavellianism (and also some elements of narcissism), it should be interpreted as a general cue suggesting that these two are hard to differentiate as currently measured (Miller et al. 2017). Despite the fact that behavioral studies demonstrate some difference between Machiavellians and psychopaths (Jones and Paulhus 2017), in the end, they are all just some malevolent characteristics, which can sometimes be differentiated from one another; however, the fact that such differentiation is possible only far down in the hierarchy makes psychopathy a preferable (or at least more general and inclusive of Machiavellian features) construct.

Limitations

The results of the current study do not deliver the final solution to the problem of the Dark Triad structure, but rather demonstrate that there are many different facets under the umbrella of a common construct. Twelve distinguished facets do not definitively exhaust the existing item pool; due to the actual length of the study, we tried to include two measures for each construct; however we missed many important measures containing many valuable items. Some example is the Dark Triad Dirty Dozen (DTDD; Jonason and Webster 2010), which is a concise measure of the Dark Triad traits. We decided to use SD3 (Jones & Paulhus, 2014) in favor of the DTDD (Jonason and Webster 2010) because both of these were inspired on the basis of standard measures, but the SD3 provided a slightly broader pool of items.

Also, some of the measures lacked important elements; for example. Within the Polish adaptation of the NPI (Bazińska and Drat-Ruszczak 2000) some items measuring Entitlement/Exploitativeness were excluded, and thus they were not included in the analyses. Although these are often found to be unreliable in their measurement (Ackerman et al. 2011), they capture the most antagonistic content of narcissism, and their omission could significantly impact the obtained hierarchical structure. Also, the Polish adaptation of the NPI (Bazińska and Drat-Ruszczak 2000) is rated on a five-point Likert type scale, instead of classical forced-choice format proposed by Raskin and Hall (1979). Although this could be seen as a limitation, more recent analyses on the NPI structure suggests that the Likert-type scale may be successfully implemented and it resolves some of existing limitations of the original NPI (e.g., weak reliability estimates; Ackerman et al. 2015).

The data was collected using the internet and participants were recruited via social networking sites, which recently has become common practice (e.g., Jonason et al. 2015; Jones and Paulhus 2011; Miller et al. 2017). However, the

gender distribution in our sample was unequal, with an underrepresentation of men – a typical problem of using social networking sites and the internet for data gathering (Vize et al. *in press*). Such a distribution could substantially limit the generalizability of our results as men score higher on Dark Triad traits than women (Jonason et al. 2009). The overrepresentation of females however is quite typical also for the research on the Dark Triad traits in which samples from many studies exceed 70% of females within the sample (see Grijalva et al. (2015) for meta-analysis regarding gender differences in narcissism, which also includes studies investigating other Dark Triad traits).

Another limitation of the present study, is the fact that it was conducted using self-report measures only. When investigating the differences between Machiavellianism and psychopathy using experimental methods, they become more salient (see Jones and Paulhus 2017), which is why we do not question the construct of the Machiavellianism itself, but rather we question its measurement in its current form (see also Miller et al. 2017). Our results simply support the idea that we need more tools, which would assess Machiavellianism in a more sophisticated manner.

Finally, our results regarding the relationships with the Big Five were limited to the basic personality traits only. There is clear evidence that personality has a hierarchical structure, beginning from the metatraits of personality (see Strus et al. 2014b for review) they expand into basic traits of personality (which were the subject of the current study), which further divides onto aspects (DeYoung et al. 2007) and facets (McCrae and Costa 1997). Although within the current study, we investigated the two top levels of the personality hierarchy, investigation of its lower-order structure is also an important issue which might provide more information on the differentiation between constructs. The results provided by DeShong et al. (2017) which investigated the relationship between the Dark Triad and the facets of personality however provided results which are consistent with our conclusions; that is, they claim that Machiavellianism is currently not adequately assessed.

Owing to these limitations, it is important to recognize that the presented structure of the Dark Triad is neither exhaustive nor final. Instead of that, we suggest that the structure of the Dark Triad is far more complex than currently conceptualized (Furnham et al. 2013) and substantial further research on its structure is needed. This paper therefore does not present a breakthrough new model of the Dark Triad, but it should be interpreted as a beacon which guides the direction of future research.

Conclusion

Our results provide evidence that Machiavellianism is a construct which is not on the same level of trait complexity as

psychopathy and narcissism and it seems to be a distinct component of psychopathy. We do not argue that the presented structure is definite, but we question the idea of the Dark Triad as a construct of three equally important socially aversive traits. We advocate on one hand, that researchers could use our work and scrutinize the issue of the Dark Triad structure further and overcome our limitations, while on the other, we support the position of Marcus and Zeigler-Hill (2015) that researchers should focus beyond narcissism and psychopathy and investigate other dark traits of personality.

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Compliance with Ethical Standards

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from all individual participants included in the study.

Conflict of Interest Radosław Rogoza declares that he has no conflict of interest. Jan Ciecuch declares that he has no conflict of interest.

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