



Personality underpinnings of dark personalities: An example of Dark Triad and deadly sins



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ABSTRACT

The Dark Triad of personality is most commonly studied model of dark personality traits. The current study attempts to empirically compare the Dark Triad to other catalog of dark personality traits, namely the seven deadly sins, and locate them within the broader model of personality – the Circumplex of Personality Metatraits model. We examined this problem from two perspectives: self- ($N = 280$) and other-report ($N = 412$) using the Short Dark Triad, Vices and Virtues Scales, and the Circumplex of Personality Metatraits Questionnaire. The Dark Triad and the seven deadly sins were substantially interrelated. Moreover, both analyzed models of dark personality traits were strongly associated with Alpha-Minus (both, in self- and other-report), providing evidence about their dark character. The expected locations within the Circumplex of Personality Metatraits were generally supported, nevertheless there were some discrepancies between self- and other report. Results of our study reveals that the Dark Triad of personality does not fully exhaust the possible catalog of the dark personality and future research is needed to fill this gap.

1. Introduction

The concept of good and evil is an inextricable component of human history. For example, the biblical book of Genesis, in which the first people disobeyed God, attempts to describe its very origins (Storoška, 2018). However, the dialogical and dramatic concepts of the dichotomous phenomenon of good and evil is not only a domain of the past, but is also prominent in more contemporary philosophical movements (Nietzsche, 1955; Safranski, 1999). In psychological research, one of the most widely utilized models of the dark side of personality is the Dark Triad, a constellation of three socially aversive traits of grandiose narcissism, Machiavellianism, and psychopathy (Paulhus & Williams, 2002). These traits are connected through callousness, lack of empathy, instrumental attitude to people, egoism, a tendency towards interpersonal manipulation and exploitation of partners (Paulhus, 2014). Despite this similarity, these traits are also possible to differentiate. For example, impulsiveness distinguishes psychopathy (Jones & Paulhus, 2011), Machiavellianism is assigned for the skill of strategic thinking and planning (Jones & Paulhus, 2009) while narcissism has the overwhelming tendency to strengthen one's grandiose self (Back, 2018). Moreover, narcissism seems to be somewhat different from psychopathy and Machiavellianism (Rogoza & Ciecuch, 2018), which is due to the fact that it comprises not only antagonistic (i.e., self-protection

through self-defense) but also agentic (i.e., assertive self-enhancement through self-promotion) facets (Back, 2018). Although the antagonistic facet has much more in common with psychopathy and Machiavellianism (Rogoza, Kowalski, & Schermer, 2019), only the agentic facet is typically studied in the context of the Dark Triad (Rogoza, Żemojtel-Piotrowska, & Campbel, 2018).

Another limitation of the Dark Triad is the fact that it does not exhaust the full catalog of darkness, that is, there are various other “dark” personality traits. Within the empirical literature, some of the most widely studied traits are sadism (Paulhus & Buckels, 2011) and spitefulness (Marcus, Zeigler-Hill, Mercer, & Norris, 2014). In this vein, one might assume that the dark side of human personality was not introduced alongside the construct of the Dark Triad but has been present for millennia throughout the history of human civilization (Storoška, 2018). One such exemplary catalog of dark personality, which might supplement the Dark Triad model, is the seven traits originating from Christian religion, representing the seven deadly sins of Anger, Envy, Gluttony, Greed, Lust, Pride, and Sloth (the characteristics of which can be seen in Table 1). Therefore, within the current work, we scrutinize how these deadly sins are related to the Dark Triad traits and how both of these models could be embedded within the broader model of human personality such as the Circumplex of Personality Metatraits (Strus, Ciecuch, & Rowiński, 2014).

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Table 1
Meaning of the seven deadly sins (Veselka et al., 2014).

Deadly sin	Meaning
Anger	Anger is characterized by uncontrollable feelings of frustration, expressed internally in the form of vengeful thoughts, or outwardly as physical assault or verbal aggression.
Envy	Envy is defined by an overwhelming sense of resentment, where individuals wish for others to be deprived of the things that they themselves lack.
Gluttony	Gluttony is characterized by overconsumption and overindulgence in the realms of food, alcohol, and drugs, as well as by extravagant spending.
Greed	Greed comprises a tendency to manipulate and betray others for personal gain.
Lust	Lust is characterized by overwhelming thoughts of a sexual nature and is often linked to promiscuity.
Pride	Pride entails excessive self-love, paired with a disregard for the efforts of others.
Sloth	Sloth is characterized by lack of motivation and unwillingness to utilize fully one's skills.

1.1. Seven deadly sins

The seven deadly sins are characterized, among others, by unrestrained aggression, sense of resentment, intemperance, a tendency to manipulate others, promiscuity in thoughts and deeds, self-love or a lack of readiness to perform one's duties (Capps, 1987). This psychological interpretation proves that sins are relatively constant, but also represent emotions, memory and motivation (Veselka, Giammarco, & Vernon, 2014; Zuckerman, 2003). Thus, they fulfill the criteria of personality traits (Buss & Plomin, 1984), and simultaneously fulfill the criteria of dark personality traits (i.e., they are all antisocial and malvolent; Paulhus, 2014).

Veselka et al. (2014) operationalized the seven deadly sins in the Vices and Virtues Scales (VAVS), suggesting that they differ slightly from the classic definitions (given e.g., by Gregory the Great and Saint Thomas Aquinas). For example, Gluttony includes "extravagant spending" while the classical definition is limited to excessive eating and drinking (Biel, 2014; Pyda, 2010). Also, Sloth, which deals with issues related to commitment to performing personal, specific tasks and interest in global problems and current events (Brud & Ciecuch, 2019), seems to differ slightly from the original definition. In its classical form, it refers to bad tendencies and actions aimed at avoiding a higher level of spiritual and thus moral life, as well as related challenges, difficulties and effort (Plich, 2010). Therefore, VAVS, although inspired by the Christian religion, does not fully reflect the classic definitions. The consequence is, however, that it is more adapted to modern functioning in everyday life.

1.2. Relations between deadly sins to dark personality traits

The seven deadly sins were found to be positively related to the Dark Triad traits (Veselka et al., 2014). More precisely, narcissism and Machiavellianism were related to Pride, while psychopathy and Machiavellianism were related to Greed. Furthermore, Vrabel, Zeigler-Hill, McCabe, and Baker (2019) analyzed deadly sins in regard to pathological variants of the Big Five traits (i.e., Antagonism, Disinhibition, Detachment, Negative Affect and Psychoticism; American Psychiatric Association, 2013; Krueger, Derringer, Markon, Watson, & Skodol, 2012). All of them had positive associations with Antagonism and Disinhibition. Additionally, Anger, Envy, and Sloth were all positively related to Negative Affect (Vrabel et al., 2019).

Wright et al. (2012) provided evidence that there are two factors of personality pathology, designated as Internalization and Externalization. The internalization factor is composed of Negative Affect and Detachment (i.e., depression, anxiety, perseverance, anhedonia and withdrawal), while the externalization factor is composed of Antagonism and Disinhibition (i.e., attention seeking, manipulative nature, deceitfulness, risk taking, grandeur, irresponsibility and impulsiveness; Widiger et al., 2019). From this perspective, all of the deadly sins are likely to be associated to immoral acts, but while some of them are directed intra-personally (i.e., Anger, Envy, and Sloth), some are more interpersonal in nature (i.e., Gluttony, Greed, Lust, and Pride).

1.3. The Circumplex of Personality Metatraits – an integrative personality model

The recently proposed Circumplex of Personality Metatraits (CPM; Strus et al., 2014) is a comprehensive model of personality entailing its dark as well as bright aspects. It is based on the assumption that personality metatraits are the broadest dimension of human personality (DeYoung, Peterson, & Higgins, 2002; Digman, 1997; Hirsh, DeYoung, & Peterson, 2009). The main axes of the CPM are Alpha/Stability (i.e., emotional, social and motivational stability) and Beta/Plasticity (i.e., behavioral and cognitive plasticity) metatraits initially found by Digman (1997) and DeYoung et al. (2002). Some researchers (Hull & Beaujean, 2011; Musek, 2007) have proven that Alpha and Beta are correlated, suggesting the existence of a General Personality Factor (i.e., integrating non-cognitive personality dimensions; GFP) at the top of a hierarchically organized personality structure. On the other hand, empirical evidence of the orthogonality of Alpha and Beta (Anusic, Schimmack, Pinkus, & Lockwood, 2009; Chang, Connelly, & Geeza, 2012), has called the existence of GFP into question. As a result, the GFP and the substantial significance of the two metatraits have been criticized (Ashton, Lee, Goldberg, & de Vries, 2009; Holden & Marjanovic, 2012; Revelle & Wilt, 2013). On the other side of this argument, many studies have shown the usefulness of the problematic GFP (Anusic et al., 2009; Rogoza, Żemojtel-Piotrowska, Rogoza, Piotrowski, & Wyszynska, 2016). CPM seems to solve this problem by changing the hierarchical personality structure to a circumplex structure, on the one hand, while keeping the theoretical meaning of the GFP on the other. More precisely, in the circumplex structure, GFP is not at the top of the personality structure, but rather at the same level as Alpha and Beta (Ciecuch & Strus, 2017). The GFP has been re-interpreted in the CPM model as Gamma, the positive pole of which is associated with positive well-being and high self-esteem, while the negative pole consists of a set of properties potentially associated with a tendency towards personality disorders. Additionally, following the logic of the circumplex model, a fourth metatrait labeled Delta was differentiated, which is a combination of high Stability and low Plasticity. Its positive pole is associated with behavioral control, a tendency to adapt and low emotionality. Its negative pole is associated with the search for stimulation, impulsiveness and dominance in interpersonal relationships. The CPM introduces another added value, not present in any previous personality model. That is, considering the transformation of the Alpha and Beta coordinate system into a circumplex structure with precisely defined angular positions of the metatraits, it enables empirical testing of hypotheses regarding precisely formulated angles and coordinates of other constructs (Strus & Ciecuch, 2017). The graphical representation of the CPM is presented in Fig. 1 and the content of each metatrait is described in Table 2.

It is worth mentioning that the CPM was inspired by the Five Factor Model (FFM) personality model (McCrae & Costa, 1997), but its five-dimensional space is transformed into two-dimensional, which makes it more parsimonious. Further, CPM provides the opportunity to integrate pathological FFM variants (APA, 2013). Metatraits from FFM correspond to Alpha and Beta, while metatraits from pathological FFM

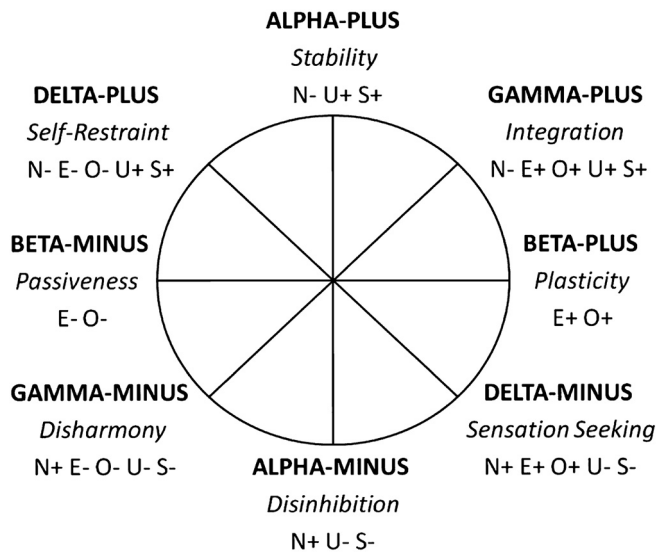


Fig. 1. Circumplex of Personality Metatraits. N = neuroticism; E = extraversion; O = openness to experience; A = agreeableness; C = conscientiousness; + means positive pole of the trait; - means negative pole of the trait. Figure adapted from Strus et al. (2014).

correspond to Gamma and Delta (Wright et al., 2012; Zawadzki, 2017). Moreover, the CPM model is described by a new quality of metatraits. On one hand, these are the most general traits, located at the very top of the organization of the structure of personality traits, above its basic level, which is formed by the characteristics of the Big Five. On the other hand, these are features with special theoretical potential, because they create the opportunity to integrate various concepts and models of personality temperament, emotions and motivation (Strus & Cieciuch, 2017). The circumplex structure of CPM has been validated in a number of studies in favor of its integrative potential (Rogoza, Cieciuch, Strus, & Baran, 2019; Topolewska-Siedzik, Cieciuch, & Strus, 2019; Zawadzki, 2017).

1.4. Locating Dark Triad traits within the CPM

Strus and Cieciuch (2017) demonstrated how the CPM could be used to integrate many other personality characteristics, such as motivation, emotions, values, temperament, well-being, and psychopathology, which is the main interest of the current work. Personality disorders are generally located in the half of the circumplex space that is limited by the Delta-Minus and Delta-Plus poles (Zawadzki, 2017). In turn, the

socially aversive Dark Triad traits are located between Alpha-Minus and Delta-Minus (psychopathy and Machiavellianism), while and between Delta-Minus and Beta-Plus (narcissism). It is worth noting that whereas the antagonistic facet of narcissism is located similarly to psychopathy and Machiavellianism, its agentic counterpart is located between Delta-Minus and Beta-Plus (Rogoza, Kowalski, & Schermer, 2019). The location of the Dark Triad construct within the Circumplex of Personality Metatraits allows mutual relations with metatraits to be studied and comparisons between models. The above research results provide further validity that the “core of darkness” is located near the Alpha-Minus.

2. Current study

The primary goal of this article is to empirically compare two catalogues of dark personality traits, namely the Dark Triad and seven deadly sins and to locate them within a broader model of personality – the CPM. We hypothesize that the seven deadly sins are located adjacent to Alpha-Minus (Rogoza, Kowalski, & Schermer, 2019; Strus & Cieciuch, 2017). Furthermore, due to their different pathological underpinnings, we assume that they will be scattered on two sides of this Alpha-Minus. That is, the sins of Gluttony, Greed, Lust and Pride are expected to reflect a more externalizing pathology, and thus, are hypothesized to be located closer to Delta-Minus (DeYoung, Peterson, Séguin, & Tremblay, 2008). In turn, sins of Anger, Envy and Sloth are expected to reflect a more internalizing pathology, and thus, are hypothesized to be located closer to Gamma-Minus (Wright et al., 2012; Zawadzki, 2017). In regard to previous research on the Dark Triad, we expect psychopathy and Machiavellianism to be located between Alpha-Minus and Delta-Minus (Rogoza, Kowalski, & Schermer, 2019), and narcissism to be located between Delta-Minus and Beta-Plus (Rogoza, Cieciuch, & Strus, 2019).

As a result, we hypothesize that sins representing a more internalizing pathology would be positively related to psychopathy and Machiavellianism (given that the expected angular location equals 45°) and non-related to narcissism (given that the expected angular location equals 90°, meaning they are orthogonal). Furthermore, we expect that sins representing externalizing pathology to be positively related to all Dark Triad traits. In regard to personality metatraits, given the expected angular locations, all sins are expected to be positively related to Alpha-Minus. Sins representing a more internalizing pathology are expected to be related to Gamma-Minus, while sins representing a more externalizing pathology – to Delta-Minus. The graphical representation of our hypotheses is illustrated in Fig. 2.

Most personality studies are essentially related to self-descriptive inventory, and thus ignore issues related to informer reports and

Table 2
Meaning of the eight metatraits in the CPM model (Strus & Cieciuch, 2017).

Metatrait	Big Five configuration	Meaning
Delta-Plus (Self-restraint)	N-, E-, O-, A+, C+	Low emotionality (both negative and positive), high behavior control, a tendency to adjust oneself, conformism, and conventionality.
Alpha-Plus (Stability)	N-, A+, C+ (E ₀ , O ₀)	Stability in the area of emotional, motivational, and social functioning, expressed as a general social adaptation tendency, an ethical attitude towards the world, and the ability to delay gratification, motivate oneself, and perseverance.
Gamma-Plus (Integration)	N-, E+, O+, A+, C+	Well-being, a warm and prosocial attitude towards people, both intra- and interpersonal harmony, openness to the world in all its richness, and effectiveness in attaining important goals.
Beta-Plus (Plasticity)	E+, O+ (N ₀ , A ₀ , C ₀)	Cognitive and behavioral openness to change and engagement to new experiences, a tendency to explore, initiative and invention in social relations, as well as orientation towards personal growth.
Delta-Minus (Sensation-seeking)	N+, E+, O+, A-, C-	Broadly defined impulsiveness, high emotional lability, stimulation-seeking, provocativeness and expansiveness in interpersonal relations.
Alpha-Minus (Disinhibition)	N+, A-, C- (E ₀ , O ₀)	High level of anti-social tendencies underpinned by unrestraint and a low frustration tolerance, as well as aggression and antagonism towards people, social norms, and obligations.
Gamma-Minus (Disharmony)	N+, E-, O-, A-, C-	Inaccessibility (distrust, coldness, distance) in interpersonal relationships, depressiveness, pessimism, and a proneness to suffer from psychological problems.
Beta-Minus (Passiveness)	E-, O- (N ₀ , A ₀ , C ₀)	Apathy, submissiveness in interpersonal relations, cognitive and behavioral passivity, as well as some type of inhibition and stagnation.

Note: For abbreviations see Fig. 1; 0 = medium level of trait intensity.

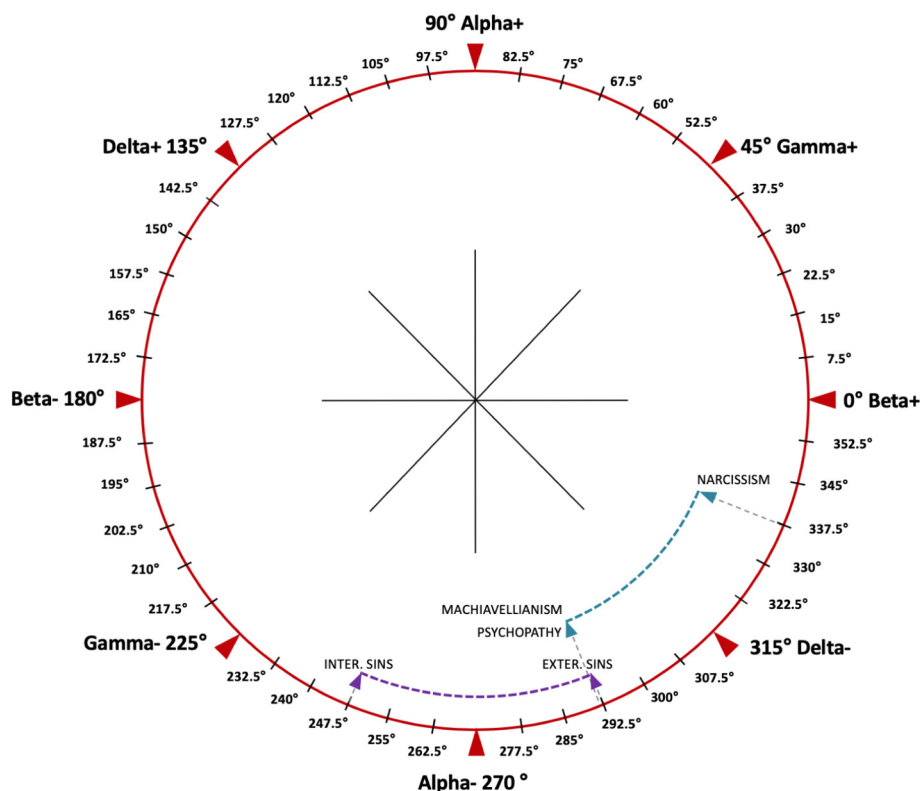


Fig. 2. Seven deadly sins and the Dark Triad within the Circumplex of Personality Metraits.

Note. INTER. SINS = internalizing sins (anger, envy, and sloth); EXTER. SINS = externalizing sins (gluttony, greed, lust, and pride).

behavioral observations. Undoubtedly, the added value of such research is the possibility of using information from friends or peers who can provide a different perspective on a person's characteristic trends (Furtner, Baldegger, & Rauthmann, 2013; Wurst et al., 2017). Therefore, we decided to examine the problem from two perspectives: self-study (study 1) and other-report (study 2). This approach may be interesting given how those with dark personality traits see themselves and are seen by others (Rauthmann, 2012; Rauthmann & Kolar, 2012). Discrepancies in self- vs. other perceptions depends on many factors, including: a sense of trust in infancy, internalization of prototype expectations towards others, depressed mood or personality disorders, etc. In the conducted research, Rau et al. (2019) showed that the effects of perception reflect the global tendency to perceive others positively vs. negatively and to view others as high or low with respect to trait content. Therefore, given the positivity factor and trait-specific factors we expect that it would be more difficult to differentiate dark personality traits.

3. Method

3.1. Participants and procedure

In the current article, we present the results of two studies. The difference between these studies is that in the first study participants provided self-ratings of own traits, while in the second study respondents provided an assessment of the behavior and reactions of people they knew well. We determined the sample size in such a way as to ensure the statistical significance of the results. In the first study, we aimed to recruit 250 participants so as to reduce estimation error in personality research (Schönbrodt & Perugini, 2013). In the second study, given the more robust character of the study (i.e., other-reports), we aimed to recruit at least 350 participants to increase its power. We did not remove anyone from the database, and we did not make any transformation, except for recoding negatively keyed items. The first

study was conducted on a group of 280 people (68.9% women and 31.1% men) from Poland. Participants' ages ranged from 20 to 63 ($M = 33.62$; $SD = 8.23$). The average age of women was 33.55 ($SD = 7.96$), and men 33.78 ($SD = 8.85$). The second measurement was attended by 412 people (145 males; mean age = 35.25; $SD = 10.62$; 267 females; mean age = 34.04; $SD = 11.10$), also from Poland. They ranged in age from 18 to 72 years ($M = 34.47$, $SD = 10.94$). Responses from study 2 regarded different people than those who participated in study 1.

The questionnaire measurement was individual, anonymous, and the testing was performed on a non-clinical sample. Only adults were recruited using social media, namely Facebook. The link with the questionnaire survey created on the USBO platform (University On-line Research System) was sent to existing, randomly selected, thematically different Facebook groups (e.g., "I am quitting smoking. Support group.", "I will sell/buy books.", "Travelers - dream trips."). Only willing persons were invited to complete the questionnaires. If someone started filling out the questionnaire and did not complete it, then the results were not saved. The system only collected fully completed questionnaires. Study 1 was started by 398 people and completed by 280. In study 2 the system collected 412 completed questionnaires, while 997 people started the study. Demographic questions were limited to age and gender (we did not control for, e.g., profession, social status, sexual orientation or religiosity). However, in the second, we included a question about perceived religiosity – "He is a believer in God. In his behavior he tries to follow religious commandments and rules" to which respondents answered using a seven-point Likert type scale (1 = completely unlike him to 7 = quite similar to him). There were no gender ($t(410) = -0.30$; $p = .768$) or age ($F(47, 364) = 1.21$; $p = .175$) differences in the perceived level of religiosity, and the mean level across the sample was 4.50 ($SD = 2.27$).

3.2. Measures

In both studies, three similar questionnaires were used, differing only in response perspective (self- vs. other-report). The first wave of research used self-description items, while in the second, all tools were adapted to suit the observer's profile. During the "other-report" measurement, participants were asked to identify a person they knew well (without any preferences/liking). Various terms appeared: "brother", "supervisor", "colleague", "friend", "husband", "wife", "ex-partner", etc. The purpose of the respondents was to indicate typical reactions and behaviors of the described person. In general, in questionnaires, both in the first and the second study, the respondents assessed their consent on a five-point Likert type scale, except for measuring personality metatraits in the second study, where a seven-point Likert type scale was used to increase relevance.

3.2.1. Seven deadly sins

The study used a questionnaire to assess the propensity to commit deadly sins – the *Vices and Virtues Scales* (VAVS; Veselka et al., 2014; Polish adaptation: Brud & Cieciuch, 2019), consisting of 70 items (10 items for each sin). The α coefficients, in the first and second (in brackets) study, were the following for these particular scales: Anger = 0.75 (0.89), Envy = 0.85 (0.90), Gluttony = 0.81 (0.85), Greed = 0.73 (0.86), Lust = 0.83 (0.90), Pride = 0.71 (0.82), Sloth = 0.67 (0.83).

3.2.2. Dark Triad traits

We also used the *Short Dark Triad* (SD3; Jones & Paulhus, 2014; Polish adaptation: Rogoza & Cieciuch, 2018), which consists of 27 items (9 items per trait). The internal consistency estimates of the scales in the first and second (in brackets) study to measure the Dark Triad were as follows: narcissism α = 0.72 (0.77), psychopathy α = 0.74 (0.82), and Machiavellianism α = 0.78 (0.84).

3.2.3. Personality metatraits

The metatraits were measured by the *Circumplex of Personality Metatraits Questionnaire - Short Form* (CPM-Q-SF; Strus & Cieciuch, 2017) consisting of 72 (9 items for each metatrait) test items. The α coefficients, in the first and second (in brackets) study, were the following for these particular scales: Beta-Plus = 0.82 (0.82), Gamma-Plus = 0.82 (0.84), Alpha-Plus = 0.69 (0.83), Delta-Plus = 0.77 (0.71), Beta-Minus = 0.73 (0.78), Gamma-Minus = 0.84 (0.81), Alpha-Minus = 0.79 (0.85), and Delta-Minus = 0.78 (0.76).

3.3. Statistical analyses

To evaluate the results, we followed the three-step procedure for analysis of circumplex models (Rogoza, Cieciuch, & Strus, 2019). The three steps are: 1) testing the circumplex structure using a non-standard example of the Structural Equation Model (SEM), that is, Browne's (1992) circular stochastic process model; 2) testing the possibility to locate an external variable within the empirical circumplex using the structural summary method (SSM; Gurtman, 1994; Zimmermann & Wright, 2017); and 3) testing congruence between empirical locations and theoretical expectations within the circumplex structure using Procrustes rotation (Schönemann, 1966). Each step is simultaneously a prerequisite for the following analyses (e.g., locating external variables on a non-circumplex structure is meaningless). To evaluate SEM, we used the following criteria of good model fit: Comparative Fit Index (CFI) and Goodness of Fit Index (GFI) should be > 0.90, and Adjusted Goodness of Fit Index (AGFI) should be > 0.85 (Byrne, 1994; Schermelleh-Engel, Moosbrugger, & Müller, 2003). As the typically used Root Mean Square Error of Approximation (RMSEA) seems to produce artificially high estimates even in the presence of a circumplex structure, we used a more liberal cutoff of < 0.13 (see Rogoza, Cieciuch, & Strus, 2019, for details). The SSM provides four main

estimates, that is: model fit (R2), the values of which should exceed 0.80 (Wright, Pincus, Conroy, & Hilsenroth, 2009), angular displacement, which represents the empirical angle (i.e., from 0 to 360), elevation, assessing the influence of a general factor, and amplitude, assessing the distinctiveness of a profile, with values above 0.15 of both elevation and amplitude being notable (Zimmermann & Wright, 2017). Finally, the empirical angles obtained in SSM were fitted against the theoretical angles presented in Fig. 2 using Procrustes rotation. For the purposes of analysis, angles were transformed onto two-dimensional factor loadings using sine and cosine functions. For example, the angle of narcissism (337.5°) was transformed onto -0.38 (sine) and 0.92 (cosine). The transformation of all theoretical angles is presented in Table 6 in the Results section. Results of the analysis provide us with two sorts of congruence coefficients, that is, overall solution congruence (does the whole model fit within the hypothesized location) and specific congruence (does a specific variable fit within the hypothesized location). The congruence coefficients above 0.95 suggest good fit between the empirical and theoretical matrices (Barrett, 1986; Lorenzo-Seva & ten Berge, 2006). The SEM and SSM were carried out in R in *CircE* (Grassi, Luccio, & Di Blas, 2010) and *circumplex* (Zimmermann & Wright, 2017) packages, while Procrustes rotation was conducted in *Orthosim 3* (Barrett, 2013). All of the raw data and statistical scripts are available at https://osf.io/b5hqf/?view_only=2025605bf09646fbab57447d2bad9b31.

4. Results

4.1. Descriptive statistics and scale correlations

The means and standard deviations of the examined variables in the whole examined group are presented in Table 3.

Table 4 shows correlations (Spearman's rho) between the seven deadly sins to the Dark Triad traits and personality metatraits in both studies. When self-report data were analyzed, Greed, Lust, and Pride were all positively related to all Dark Triad traits. Anger, Envy, and Gluttony were positively related to Machiavellianism, and psychopathy, but not narcissism. Finally, Sloth was found to be positively related only to Machiavellianism. When other-report data were analyzed, we found the pattern of relations to be less differentiated, that is, all sins were

Table 3

Descriptive statistics for the seven deadly sins, the Dark Triad and personality metatraits (study 1 and study 2).

	Study 1 (self-report)				Study 2 (other-report)			
	M	SD	S	K	M	SD	S	K
Deadly sins								
Anger	2.59	0.63	0.42	0.66	2.44	0.95	0.67	-0.25
Envy	2.15	0.66	0.62	0.44	2.24	0.88	0.83	0.24
Gluttony	1.75	0.58	1.62	3.80	1.88	0.79	1.23	1.05
Greed	2.19	0.56	1.01	1.43	2.22	0.83	0.91	0.36
Lust	2.11	0.70	0.63	-0.18	1.94	0.86	1.13	0.78
Pride	2.19	0.52	0.48	0.34	2.35	0.76	0.72	0.12
Sloth	2.20	0.53	0.20	-0.22	2.20	0.77	0.68	0.26
Dark Triad								
Narcissism	2.81	0.59	0.23	0.25	2.66	0.72	0.45	-0.19
Psychopathy	1.87	0.58	0.88	1.22	1.98	0.79	1.08	0.73
Machiavellianism	2.66	0.66	0.33	0.09	2.41	0.81	0.82	0.41
Personality metatraits								
Beta+	3.66	0.61	-0.50	0.96	4.32	1.26	-0.23	-0.56
Gamma+	3.96	0.54	-0.87	2.97	4.58	1.26	-0.63	-0.01
Alpha+	3.79	0.47	-0.72	4.00	4.98	1.25	-0.82	0.39
Delta+	3.20	0.58	-0.32	0.72	4.26	1.09	-0.50	0.16
Beta-	2.47	0.55	0.17	0.30	3.20	1.20	0.37	-0.26
Gamma-	2.49	0.73	0.41	-0.32	2.90	1.29	0.65	-0.16
Alpha-	2.07	0.60	0.82	1.57	2.73	1.40	0.96	0.37
Delta-	2.77	0.64	0.57	1.01	3.41	1.26	0.42	-0.39

Table 4
Correlations between the seven deadly sins to the Dark Triad and personality metatraits in study 1 (N = 280) and study 2 (N = 412).

	Anger	Envy	Gluttony	Greed	Lust	Pride	Sloth
Study 1 (self-report)							
Dark Triad							
Narcissism	0.09	0.06	0.19	0.31*	0.27*	0.48*	-0.04
Psychopathy	0.45*	0.28*	0.45*	0.46*	0.44*	0.40*	0.19
Machiavellianism	0.33*	0.35*	0.33*	0.62*	0.48*	0.52*	0.22*
Personality metatraits							
Beta +	-0.13	-0.18	0.09	0.12	0.11	0.24*	-0.34*
Gamma +	-0.37*	-0.38*	-0.08	-0.16	-0.12	-0.04	-0.34*
Alpha +	-0.37*	-0.31*	-0.19	-0.20	-0.20	-0.08	-0.44*
Delta +	-0.20	-0.06	-0.14	-0.10	-0.14	-0.03	-0.08
Beta -	0.09	0.20	-0.01	-0.01	-0.02	-0.01	0.28*
Gamma -	0.51*	0.42*	0.22*	0.29*	0.29*	0.14	0.46*
Alpha -	0.67*	0.44*	0.30*	0.44*	0.31*	0.35*	0.28*
Delta -	0.21	0.14	0.43*	0.37*	0.42*	0.31*	0.02
Study 2 (other-report)							
Dark Triad							
Narcissism	0.36*	0.38*	0.46*	0.57*	0.47*	0.66*	0.16
Psychopathy	0.72*	0.63*	0.64*	0.67*	0.55*	0.70*	0.56*
Machiavellianism	0.61*	0.61*	0.51*	0.73*	0.48*	0.71*	0.48*
Personality metatraits							
Beta +	-0.37*	-0.36*	-0.15	-0.18*	-0.04	-0.09	-0.45*
Gamma +	-0.56*	-0.51*	-0.37*	-0.42*	-0.23*	-0.35*	-0.59*
Alpha +	-0.63*	-0.60*	-0.52*	-0.58*	-0.43*	-0.55*	-0.64*
Delta +	-0.41*	-0.34*	-0.40*	-0.34*	-0.32*	-0.32*	-0.39*
Beta -	0.27*	0.30*	0.11	0.16	0.04	0.09	0.36*
Gamma -	0.68*	0.60*	0.42*	0.41*	0.30*	0.40*	0.66*
Alpha -	0.80*	0.62*	0.54*	0.59*	0.43*	0.62*	0.51*
Delta -	0.45*	0.34*	0.52*	0.49*	0.51*	0.57*	0.27*

Note: Using Spearman's rho correlation coefficient. A Bonferroni correction was applied (significant at *p = .0006).

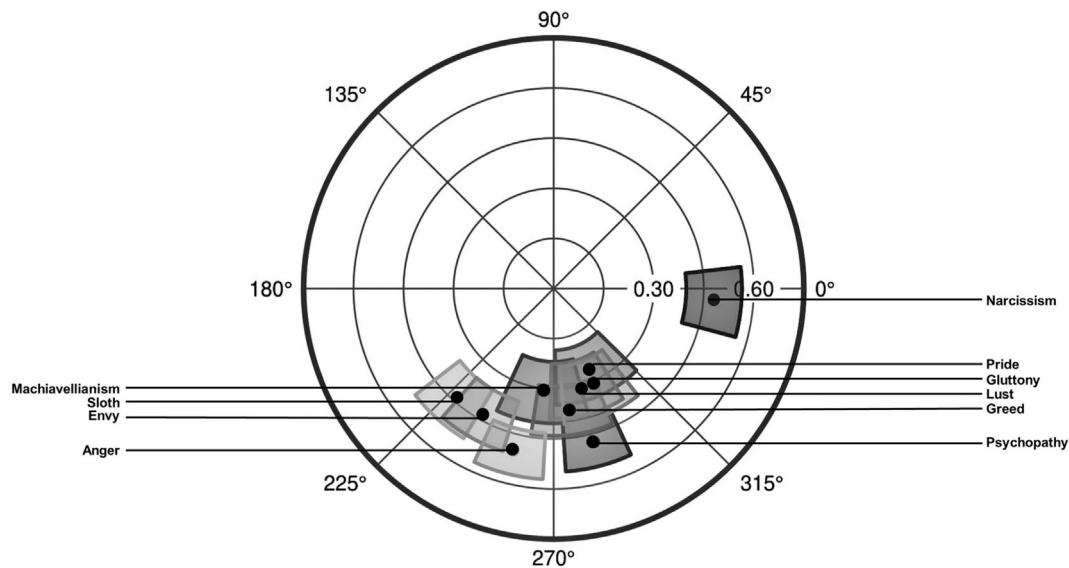


Fig. 3. Empirical locations of the seven sins and the Dark Triad within Circumplex of Personality Metatraits.

related to all Dark Triad traits (except for narcissism being non-related to Sloth). Results with other-report data show that there were significant positive correlations between Delta-Minus and Gluttony, Lust, and Pride. Between Alpha-Minus and Anger, Envy, Gluttony, Greed, Pride, and Sloth, as well as between Gamma-Minus and Anger, Envy, and Sloth there was a high positive and negative correlation. In addition, we found positive correlations between the traits of the Dark Triad and the deadly sins. Narcissism significantly positively correlated with Greed, and Pride, psychopathy with Anger, Envy, Gluttony, Greed, Lust, Pride, and Sloth and Machiavellianism's strong relations with Anger, Envy, Gluttony, Greed, and Pride were also noted.

In regard to self-report correlations to personality metatraits,

Gluttony, Greed, Lust, and Pride were found to be positively related to Alpha-Minus, and Delta-Minus. While only Pride was also related to Beta-Plus, the rest of the aforementioned sins were also positively related to Gamma-Minus. Anger, Envy, and Sloth were negatively related to Gamma-Plus and Alpha-Plus, and positively related to Gamma-Minus and Alpha-Minus. Sloth was the only sin that also negatively related to Beta-Plus and positively to Beta-Minus. In regard to other-report data, again relations were more blurred. That is, all sins were found to be negatively related to Gamma-Plus, Alpha-Plus and Delta-Plus, and positively related to Gamma-Minus, Alpha-Minus and Delta-Minus. Moreover, Greed was found to be negatively related to Beta-Plus, whereas Anger, Envy, and Sloth were all negatively related to Beta-Plus

and positively to Beta-Minus.

4.2. Study 1

4.2.1. Step 1. Testing the circumplex structure of CPM

We tested whether the CPM assumes the criteria of the circumplex model in our data (that is, with both spacing and communalities constrained to be equal). The results fully supported the circumplex character of the model ($\chi^2_{(24)} = 64.84; p < .001; CFI = 0.960; GFI = 0.965; AGFI = 0.948; RMSEA = 0.078$). Thus, it is plausible to locate external variables within its space.

4.2.2. Step 2. Testing the empirical location of the deadly sins and dark triad within the CPM

The results of the SSM are provided in Table 8, and the empirical projections of the Dark Triad and deadly sins are presented in Fig. 3. All of the external variables were well-fitted; thus, the interpretation of their structural profiles is plausible. All of the amplitude values were above 0.15, suggesting that each profile is distinct, and all elevation values (except the one for Machiavellianism, which was 0.16) were below 0.15, suggesting little influence of the general factor (which is not assumed in the CPM).

All of the seven deadly sins were located in proximity to Alpha-Minus. Three of them, that is, Anger, Envy, and Sloth, were located left of Alpha-Minus, while Gluttony, Greed, Lust, and Pride were located right of it. Psychopathy and Machiavellianism were located in greatest proximity to Alpha-Minus, but while psychopathy was located in-between Alpha-Minus and Delta-Minus as expected, Machiavellianism was located left of the Alpha-Minus line, with confidence intervals reaching towards both, Gamma-Minus and Delta-Minus. Narcissism, as expected, was located between Beta-Plus and Delta-Minus.

4.2.3. Step 3. Testing congruence between empirical and theoretical circumplex

In Table 9, we present the transformation of the empirical and theoretical angles onto matrices, as well as congruence coefficients between these matrices for each specific scale.

The predicted locations of the seven deadly sins was confirmed, both in terms of overall model as well as specific scale locations. In turn, there was little evidence for the overall congruence of the Dark Triad location within the CPM. More specifically, whereas the position of psychopathy was perfectly replicated in the empirical data, Machiavellianism was located beyond Alpha-Minus, while narcissism was located in great proximity to Beta-Plus.

4.3. Study 2

4.3.1. Step 1. Testing circumplex structure of CPM

The circumplex structure did not replicate in a peer-report ($\chi^2_{(24)} = 331.90; p < .001; CFI = 0.868; GFI = 0.842; AGFI = 0.763; RMSEA = 0.177$). Therefore, we tested less restrictive quasi-circumplex models with a) unequal communalities and b) unequal spacing. While releasing the equal communality constraint did not sufficiently improve model fit ($\chi^2_{(17)} = 242.04; p < .001; CFI = 0.904; GFI = 0.880; AGFI = 0.746; RMSEA = 0.179$), releasing the constraint of equal spacing resulted in acceptable estimates of fit indices ($\chi^2_{(17)} = 125.67; p < .001; CFI = 0.953; GFI = 0.938; AGFI = 0.869; RMSEA = 0.125$). The angular locations of the metatraits were as follow (theoretical angles are presented in brackets): Beta-Plus = 0 (0), Gamma-Plus = 33 (45), Alpha-Plus = 60 (90), Delta-Plus = 86 (135), Beta-Minus = 164 (180), Gamma-Minus = 221 (225), Alpha-Minus = 236 (270), Delta-Minus = 280 (315). The CPM in the peer report resembles a circumplex structure, but the positive and negative poles were visibly separated (i.e., 78 and 80°) from one another. The distances in the positive pole were shorter than expected (i.e., from 26 to 33). In the negative pole, the Beta-Minus metatrait was located

further from the remaining metatraits (distance of 66°), Gamma-Minus and Alpha-Minus were closely grouped together (with distance of 15°), and with Delta-Minus at the expected distance of 44°. Therefore, further analyses of structural summary profiles (i.e., Step 2 of the procedure; the results of which are presented in Table 10) might be done only as a qualitative interpretation, while application of Procrustes rotation (i.e., Step 3) is meaningless.

All of the profiles fitted sufficiently well. All of the deadly sins were located in proximity to Alpha-Minus. Gluttony, Lust, and Pride were located to its right, while Anger, Envy, and Sloth to its left, confirming the expected locations. Greed was located only slightly left of Alpha-Minus, failing to reproduce the theorized location. Narcissism was located in greatest proximity to Delta-Minus and psychopathy closely to Alpha-Minus, confirming expectations. Similarly to the self-report data, Machiavellianism was unexpectedly found between Gamma-Minus and Alpha-Minus.

5. Discussion

The dark side of the personality has been of interest for a long time (Christie & Geis, 1970; Hare, 1985; Raskin & Hall, 1981). In the empirical literature, the Dark Triad model is most often used, but this does not mean that it is the only model of darkness. In the current study, we compared the Dark Triad (Paulhus & Williams, 2002) model with another catalog of darkness – sins (Veselka et al., 2014). We checked their relations and examined how both models are located in the CPM (Strus et al., 2014), from the perspective of both self- and other-reports.

5.1. Relations of the seven deadly sins to the Dark Triad and personality metatraits in two perspectives

Data from both reports reveal significant connections between the seven deadly sins and the traits of the Dark Triad. In both studies, it was psychopathy and Machiavellianism that revealed significant connections with the largest number of sins representing external and internal pathology – in self-report data with Anger, Envy and Gluttony, while in other-report data with Anger, Envy, Gluttony, Greed and Pride. This discovery confirms, among other things, the conceptual similarities between the two dark traits (Rogoza, Kowalski, & Schermer, 2019). Once again, in both studies, narcissism turned out to be not completely dark, bringing together the smallest number of sins – Greed and Pride. In addition, it is worth noting that the strongly correlated scales of sins (see: Table 5) and the traits of the Dark Triad (see: Table 6) seem to have common elements. A strong common denominator of scales can be a dimension that represents the dark side of personality well. Regarding the meta-personality, hypotheses about the sins and the Dark Triad have been essentially confirmed. However, in relation to other reports, the relations were again more blurred, and the results were more non-specific. The discussion between these perspectives is discussed further (Table 7).

Table 5
Intercorrelations of the seven deadly sins in study 1 (N = 280) and study 2 (N = 412).

	1	2	3	4	5	6	7
1. Anger	–	0.73*	0.56*	0.63*	0.46*	0.64*	0.61*
2. Envy	0.58*	–	0.51*	0.69*	0.43*	0.73*	0.59*
3. Gluttony	0.30*	0.24*	–	0.68*	0.57*	0.62*	0.47*
4. Greed	0.39*	0.51*	0.48*	–	0.56*	0.81*	0.50*
5. Lust	0.36*	0.33*	0.38*	0.51*	–	0.57*	0.39*
6. Pride	0.40*	0.52*	0.32*	0.63*	0.49*	–	0.43*
7. Sloth	0.43*	0.41*	0.20*	0.26*	0.18	0.18	–

Note. Using Spearman's rho correlation coefficient. A Bonferroni correction was applied (significant at * $p = .001$). The results for study 1 are below the diagonal.

Table 6
Intercorrelations of the Dark Triad traits in study 1 (N = 280) and study 2 (N = 412).

	1	2	3
1. Narcissism	–	0.52*	0.51*
2. Psychopathy	0.33*	–	0.66*
3. Machiavellianism	0.32*	0.58*	–

Note. Using Spearman's rho correlation coefficient. A Bonferroni correction was applied (significant at *p = .005). The results for study 1 are below the diagonal.

5.2. Locating the seven deadly sins and the Dark Triad traits within the Circumplex of Personality Metatraits

All of the deadly sins were strongly associated with Alpha-Minus in both self- and other-report, which confirms the hypothesis of the location of darkness. Sins representing external pathology were scattered on the right side of Alpha-Minus, while sins representing internal pathology were placed on the left side, thus aligning with the differentiation of externalizing and internalizing personality disorders assumed by the CPM (Zawadzki, 2017), confirming the theoretically predicted locations. Basically, the results obtained from self- and other-reports generally supported our expectations.

In regard to the expected locations of the Dark Triad traits, we accurately predicted only the location of psychopathy, which was located in greatest proximity to Alpha-Minus. Machiavellianism, both in self- and other-reports, although located near Alpha-Minus, was located towards Gamma-Minus (instead of Delta-Minus), both from a self- and other-report perspective. This is in slight contrast to the previous research (Rogoza, Kowalski, & Schermer, 2019). However, the measurement of Machiavellianism has frequently been criticized (Miller, Hyatt, Maples-Keller, Carter, & Lynam, 2017), which might have distorted results in either of the two studies. Finally, narcissism in the self-report data was located close to Beta-Plus (instead of in-between Delta-Minus and Beta-Plus), while in the other-report data it was aligned with Delta-Minus. This result is in congruence with a previous study (Rogoza, Kowalski, & Schermer, 2019) and is not surprising, given that the assessment of antagonistic aspects of this trait in Dark Triad measures is limited (Rogoza et al., 2018).

Summing up, the results of our investigation emphasizes that the common space of the seven sins and the Dark Triad is the space of Alpha-Minus. According to Paulhus (2014), the term “dark personality” refers to a group of socially aversive features. Both catalogues of darkness examined in the current study fit into this category of darkness, because they were all located in proximity to Alpha-Minus. Therefore, the results of the analyses confirm the dark nature of sins and the Dark Triad with the exception of narcissism.

5.3. Discrepancies between self- and other-report

The circumplex structure of the CPM, although successfully verified

Table 7
Intercorrelations of the metatraits in study 1 (N = 280) and study 2 (N = 412).

	1	2	3	4	5	6	7	8
1. Beta +	–	0.72*	0.46*	0.15	–0.68*	–0.47*	–0.35*	0.23*
2. Gamma +	0.58*	–	0.72*	0.41*	–0.50*	–0.66*	–0.57*	–0.10
3. Alpha +	0.37*	0.53*	–	0.62*	–0.21*	–0.61*	–0.66*	–0.41*
4. Delta +	–0.14	0.05	0.44*	–	0.14	–0.38*	–0.38*	–0.46*
5. Beta –	–0.52*	–0.36*	–0.04	0.48*	–	0.44*	0.30*	–0.24*
6. Gamma –	–0.35*	–0.58*	–0.33*	0.06	0.43*	–	0.68*	0.31*
7. Alpha –	–0.07	–0.35*	–0.39*	–0.21*	0.10	0.53*	–	0.51*
8. Delta –	0.45*	0.18	–0.06	–0.27*	–0.27*	0.13	0.36*	–

Note. Using Spearman's rho correlation coefficient. A Bonferroni correction was applied (significant at *p = .0008). The results for study 1 are below the diagonal.

in the self-report data, was rejected when other-report data were analyzed. Adequate model fit was reached only for quasi-circumplex model, in which circumplex variables were unequally spaced (i.e., having different distances one from another). The high distances were especially visible between positive vs. negative poles (i.e., Beta-Plus to Delta-Minus and Beta-Minus to Delta-Plus), as well as squeezing and grouping the positive and negative poles closely together. Rau et al. (2019) argued that most people see others as globally positive vs. negative as well as see others high or low on specific traits. This perceiver bias seems to explain to some extent our results. On the one hand, personality metatraits were unequally spaced with a visible break between positive vs. negative poles, (i.e., reflecting positivity/negativity bias). On the other, when dark personality traits were assessed, the results were much less specific (which was also visible in correlational analyses) than in the self-report data and their locations within the quasi-circumplex were compressed in a small space (reflecting the bias of seeing others as scoring high on overall darkness).

Despite these two sources of perceiver effect bias, overall, the results between self- and other-report data were mostly congruent. However, the exception was found in narcissism. Given the fact that, in the current research, we studied an agentic (as typically done in Dark Triad research; Rogoza, Ciecuch, & Strus, 2019), and not an antagonistic facet of narcissism (which is more closely aligned with psychopathy and Machiavellianism; Rogoza, Kowalski, & Schermer, 2019), our results were partially supported in the self-report examination of its location. However, in the other-report examination, agentic narcissism was located in great proximity to Delta-Minus. Narcissistic self-presentation seems therefore to diminish antagonism while conquering grandiosity. Narcissists, by default, tend to promote themselves using agentic strategies (Wetzel, Leckelt, Gerlach, & Back, 2016), which leads to an increase in popularity over time (Leckelt, Küfner, Nestler, & Back, 2015). However, simultaneously, the antagonistic facet of narcissism leads to loss of this gained popularity (Leckelt et al., 2019). Although the “core” location of narcissism was already hypothesized to be near Delta-Minus (Rogoza, 2018), self-reported results provided only partial support for this claim, similar to the present study. Given the discrepancies in how narcissists describe themselves and how they are seen by others (Rauthmann, 2012; Rauthmann & Kolar, 2012; Rentzsch & Gebauer, 2019), this result was not surprising. Summing up, our results provide some evidence that narcissists tends to overclaim their agentic facets, and underappreciate antagonistic facets when compared to other-reports.

6. Limitations

There are several limitations to the current study. First, our research cannot be fully generalized, because it mainly concerns young people, mostly Polish women. In addition, we did not control other variables that could have a potential impact, such as (own) religiosity, education, professional status, etc. Third, some scales showed low reliability (e.g., of Sloth as reported in study 1). However, it is consistent with previous studies (e.g., Veselka et al., 2014; Vrabel et al., 2019). Finally, although

Table 8
Structural summary profiles of the seven sins and Dark Triad within the self-reported Circumplex of Personality Metatraits.

Profile	R ²	Displacement	Amplitude	Elevation
Deadly sins				
Anger	0.96	255.9 [245.4, 267.3]	0.50 [0.44, 0.57]	0.09 [0.02, 0.16]
Envy	0.99	240.5 [228.9, 252.7]	0.43 [0.36, 0.51]	0.05 [0.00, 0.12]
Gluttony	0.97	293.0 [273.7, 308.8]	0.32 [0.23, 0.40]	0.09 [0.04, 0.14]
Greed	0.97	277.5 [261.1, 294.4]	0.36 [0.29, 0.44]	0.12 [0.06, 0.20]
Lust	0.95	285.7 [267.2, 302.4]	0.31 [0.23, 0.39]	0.09 [0.04, 0.14]
Pride	0.94	293.7 [272.2, 314.5]	0.26 [0.19, 0.35]	0.14 [0.07, 0.21]
Sloth	0.97	228.4 [217.8, 239.6]	0.44 [0.35, 0.52]	-0.01 [-0.05, 0.04]
Dark Triad				
Narcissism	0.98	356.0 [344.7, 6.1]	0.48 [0.40, 0.56]	0.10 [0.04, 0.16]
Psychopathy	0.99	284.7 [273.9, 295.4]	0.47 [0.41, 0.55]	0.10 [0.04, 0.18]
Machiavellianism	0.97	264.7 [245.1, 286.2]	0.31 [0.22, 0.40]	0.16 [0.08, 0.26]

Table 9
Congruence estimates between empirical results and theoretical predictions.

	Empirical angle	Empirical matrix		Theoretical angle	Theoretical matrix		Congruence
		Sine	Cosine		Sine	Cosine	
Deadly sins							
Anger	255.9	-0.97	-0.24	247.5	-0.92	-0.38	0.97
Envy	240.5	-0.87	-0.49	247.5	-0.92	-0.38	1.00
Gluttony	293.0	-0.92	0.39	292.5	-0.92	0.38	0.99
Greed	277.5	-0.99	0.13	292.5	-0.92	0.38	0.99
Lust	285.7	-0.96	0.27	292.5	-0.92	0.38	1.00
Pride	293.7	-0.92	0.40	292.5	-0.92	0.38	0.99
Sloth	228.4	-0.75	-0.66	247.5	-0.92	-0.38	0.97
Dark Triad							
Narcissism	356.0	-0.07	1.00	337.5	-0.38	0.92	0.87
Psychopathy	284.7	-0.97	0.25	292.5	-0.92	0.38	1.00
Machiavellianism	264.7	-1.00	-0.09	292.5	-0.92	0.38	0.83

Table 10
Structural summary profiles of the seven sins and Dark Triad within peer-reported Circumplex of Personality Metatraits.^a

	R ²	Displacement	Amplitude	Elevation
Deadly sins				
Anger	0.85	229.8 [227.1, 232.5]	0.96 [0.89, 1.00]	0.01 [-0.02, 0.03]
Envy	0.85	227.2 [224.2, 230.4]	0.85 [0.76, 0.93]	-0.01 [-0.04, 0.02]
Gluttony	0.85	239.0 [234.9, 243.6]	0.73 [0.64, 0.81]	0.01 [-0.02, 0.04]
Greed	0.84	234.7 [231.1, 238.9]	0.75 [0.65, 0.84]	0.01 [-0.02, 0.03]
Lust	0.84	244.3 [238.7, 251.1]	0.59 [0.49, 0.69]	0.02 [-0.01, 0.05]
Pride	0.83	239.2 [235.3, 243.8]	0.72 [0.63, 0.81]	0.03 [0.00, 0.06]
Sloth	0.85	224.2 [221.3, 227.2]	0.89 [0.81, 0.96]	-0.04 [-0.07, -0.02]
Dark Triad				
Narcissism	0.82	276.3 [265.4, 291.7]	0.41 [0.34, 0.49]	0.04 [0.02, 0.07]
Psychopathy	0.85	235.3 [232.4, 238.4]	0.90 [0.82, 0.97]	0.00 [-0.02, 0.03]
Machiavellianism	0.83	229.5 [225.5, 233.9]	0.69 [0.59, 0.78]	0.03 [0.00, 0.06]

^a We have also checked whether religiosity influences results by asking a question about religiosity of the described people. On this basis, we divided the sample by those low on perceived religiosity (i.e., scores 1–4; N = 180) and those high on perceived religiosity (i.e., scores 5–7; N = 232). The results were highly congruent for all analyses to those reported in-text.

we used self- and other-report data, it would be more informative to evaluate the same people from both perspectives. In our studies, participants rated different individuals, so comparisons between the studies are limited.

7. Summary and conclusions

The Dark Triad is undoubtedly the most frequently examined model of dark personality traits, but it does not fully exhaust the catalog of darkness. There are also other models that cover other aspects of the dark side of the personality such as the seven deadly sins. Interestingly, (1) to some extent, the Dark Triad and seven deadly sins share a psychological meaning as both catalogues are located close to Delta-Minus; but (2) there is still space closer to Gamma-Minus, comprised by the

seven deadly sins. Moreover, (3) the logic of the CPM model (Strus & Cieciuch, 2017) also posits that is likely that there are traits located between Gamma-Minus and Delta-Plus that are related to maladaptive (but not necessarily socially aversive) constructs but, to date, operationalizations of the dark side of personality (i.e., the Dark Triad and the seven deadly sins) have not proposed any psychological content for this area. However, it is possible that the constructs located in this area may be related to intrapsychic problems rather than to interpersonal problems and therefore are not included in the dark side of personality traits. However, because these traits are nevertheless expected to be maladaptive (although for the individual rather than for others) it would be worthwhile to fill this gap in future research and theory.

CRedit authorship contribution statement

Piotr Paweł Brud: Writing - original draft, Writing - review & editing, Visualization, Resources. **Radosław Rogoza:** Writing - original draft, Writing - review & editing, Methodology, Resources. **Jan Cieciuch:** Writing - original draft, Writing - review & editing, Visualization.

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References

- American Psychiatric Association (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: APA.
- Anusic, I., Schimmack, U., Pinkus, R. T., & Lockwood, P. (2009). The nature and structure of correlations among Big Five ratings: The halo-alpha-beta model. *Journal of Personality and Social Psychology*, *97*, 1142–1156. <https://doi.org/10.1037/a0017159>.
- Ashton, M. C., Lee, K., Goldberg, L. R., & de Vries, R. E. (2009). Higher order factors of personality: Do they exist? *Personality and Social Psychology Review*, *13*, 79–91 (doi:10.1177%2F1088868309338467).
- Back, M. D. (2018). The narcissistic admiration and rivalry concept. In A. D. Hermann, A. B. Brunnel, & J. D. Foster (Eds.). *Handbook of trait narcissism. Key advances, research methods, and controversies* (pp. 57–67). Cham: Springer. https://doi.org/10.1007/978-3-319-92171-6_6.
- Barrett, P. (1986). Factor comparison: An examination of three methods. *Personality and Individual Differences*, *7*, 327–340. [https://doi.org/10.1016/0191-8869\(86\)90008-5](https://doi.org/10.1016/0191-8869(86)90008-5).
- Barrett, P. (2013). Orthosim: Target-comparison matrix fitting. Retrieved from <https://www.pbarrett.net/orthosim/orthosim.html>.
- Biel, S. (2014). *Równowaga duchowa. Wokół siedmiu grzechów głównych. [Spiritual balance. Around the seven deadly sins]*. Kraków: Wydawnictwo WAM.
- Browne, M. W. (1992). Circumplex models for correlation matrices. *Psychometrika*, *57*, 469–497. <https://doi.org/10.1007/BF02294416>.
- Brud, P. P., & Cieciuch, J. (2019). Polish adaptation of the Vices and Virtues Scales (VAVS). *Mental Health, Religion and Culture*. <https://doi.org/10.1080/13674676.2019.1635575> Advance online publication.
- Buss, D. M., & Plomin, R. (1984). Theory and measurement of EAS. *Temperament: Early developing personality traits* (pp. 84–104). Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Byrne, B. M. (1994). *Structural equation modeling with EQS and EQS/Windows*. Thousand Oaks, CA: Sage Publications.
- Capps, D. (1987). *Deadly sins and saving virtues*. Philadelphia, PA: Fortress.
- Chang, L., Connelly, B. S., & Geeza, A. A. (2012). Separating method factors and higher order traits of the Big Five: A meta-analytic multitrait-multimethod approach. *Journal of Personality and Social Psychology*, *102*, 408–426. <https://doi.org/10.1037/a0025559>.
- Christie, R., & Geis, F. L. (1970). *Studies in Machiavellianism*. New York, NY: Academic Press.
- Cieciuch, J., & Strus, W. (2017). Two-factor model of personality. In V. Zeigler-Hill, & T. K. Shackelford (Eds.). *Encyclopedia of personality and individual differences* (pp. 1–17). Cham: Springer International Publishing AG. https://doi.org/10.1007/978-3-319-28099-8_2129-1.
- DeYoung, C. G., Peterson, J. B., & Higgins, D. M. (2002). Higher-order factors of the Big Five predict conformity: Are there neuroses of health? *Personality and Individual Differences*, *33*, 533–552. [https://doi.org/10.1016/S0191-8869\(01\)00171-4](https://doi.org/10.1016/S0191-8869(01)00171-4).
- DeYoung, C. G., Peterson, J. B., Séguin, J. R., & Tremblay, R. E. (2008). Externalizing behavior and the higher order factors of the Big Five. *Journal of Abnormal Psychology*, *117*, 947–953. <https://doi.org/10.1037/a0013742>.
- Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality and Social Psychology*, *73*, 1246–1256. <https://doi.org/10.1037/0022-3514.73.6.1246>.
- Furtner, M. R., Baldegger, U., & Rauthmann, J. F. (2013). Leading yourself and leading others: Linking self-leadership to transformational, transactional, and laissez-faire leadership. *European Journal of Work and Organizational Psychology*, *22*, 436–449. <https://doi.org/10.1080/1359432X.2012.665605>.
- Grassi, M., Luccio, R., & Di Blas, L. (2010). CircE: An R implementation of Browne's circular stochastic process model. *Behavior Research Methods*, *42*, 55–73. <https://doi.org/10.3758/BRM.41.1.55>.
- Gurtman, M. B. (1994). The circumplex as a tool for studying normal abnormal personality: A methodological primer. In S. Strack, & M. Lorr (Eds.). *Differentiating normal and abnormal personality* (pp. 243–263). New York: Springer.
- Hare, R. D. (1985). Comparison of procedures for the assessment of psychopathy. *Journal of Consulting and Clinical Psychology*, *53*, 7–16. <https://doi.org/10.1037/0022-006X.53.1.7>.
- Hirsh, J. B., DeYoung, C. G., & Peterson, J. B. (2009). Metatraits of the Big Five differentially predict engagement and restraint of behavior. *Journal of Personality*, *77*, 1085–1102. <https://doi.org/10.1111/j.1467-6494.2009.00575.x>.
- Holden, R. R., & Marjanovic, Z. (2012). A putatively general factor of personality (GFP) is not so general: A demonstration with the NEO PI-R. *Personality and Individual Differences*, *52*, 37–40. <https://doi.org/10.1016/j.paid.2011.08.024>.
- Hull, D. M., & Beaujean, A. A. (2011). Higher order factors of personality in Jamaican young adults. *Personality and Individual Differences*, *50*, 878–882. <https://doi.org/10.1016/j.paid.2011.01.013>.
- Jones, D. N., & Paulhus, D. L. (2009). Machiavellianism. In M. R. Leary, & R. H. Hoyle (Eds.). *Handbook of individual differences in social behavior* (pp. 93–108). New York: Guilford.
- Jones, D. N., & Paulhus, D. L. (2011). The role of impulsivity in the Dark Triad of personality. *Personality and Individual Differences*, *51*, 679–682. <https://doi.org/10.1016/j.paid.2011.04.011>.
- Jones, D. N., & Paulhus, D. L. (2014). Introducing the Short Dark Triad (SD3) a brief measure of dark personality traits. *Assessment*, *21*, 28–41 (doi:10.1177%2F1073191113514105).
- Krueger, R. F., Derringer, J., Markon, K. E., Watson, D., & Skodol, A. E. (2012). Initial construction of a maladaptive personality trait model and inventory for DSM-5. *Psychological Medicine*, *42*, 1879–1890. <https://doi.org/10.1017/S0033291711002674>.
- Leckelt, M., Küfner, A. C. P., Nestler, S., & Back, M. D. (2015). Behavioral processes underlying the decline of narcissists' popularity over time. *Journal of Personality and Social Psychology*, *109*, 856–871. <https://doi.org/10.1037/pspp0000057>.
- Leckelt, M., Geukes, K., Küfner, A. C. P., Niemeyer, L. M., Hutteman, R., Osterholz, S., Egloff, B., ... Back, M. D. (2019). A longitudinal field investigation of narcissism and popularity over time: How agentic and antagonistic aspects of narcissism shape the development of peer relationships. *Personality and Social Psychology Bulletin*, *46*, 643–659. <https://doi.org/10.1177/0146167219872477>.
- Lorenzo-Seva, U., & ten Berge, J. M. F. (2006). Tucker's congruence coefficient as a meaningful index of factor similarity. *Methodology*, *2*, 57–64. <https://doi.org/10.1027/1614-1881.2.2.57>.
- Marcus, D. K., Zeigler-Hill, V., Mercer, S. H., & Norris, A. L. (2014). The psychology of spite and the measurement of spitefulness. *Psychological Assessment*, *26*, 563–574. <https://psycnet.apa.org/doi/10.1037/a0036039>.
- McCrae, R. R., & Costa, P. T. (1997). Personality trait structure as a human universal. *American Psychologist*, *52*, 509–516. <https://doi.org/10.1037/0003-066X.52.5.509>.
- Miller, J. D., Hyatt, C. S., Maples-Keller, J. L., Carter, N. T., & Lynam, D. R. (2017). Psychopathy and Machiavellianism: A distinction without a difference? *Journal of Personality*, *85*, 439–453. <https://doi.org/10.1111/jopy.12251>.
- Musek, J. (2007). A general factor of personality: Evidence for the Big One in the five-factor model. *Journal of Research in Personality*, *41*, 1213–1233. <https://doi.org/10.1016/j.jrp.2007.02.003>.
- Nietzsche, F. (1955). In M. Cowan (Ed.). *Beyond good and evil*. Chicago, IL: Henry Regnery Trans.
- Paulhus, D. L. (2014). Toward a taxonomy of dark personalities. *Current Directions in Psychological Science*, *23*, 421–426 (doi:10.1177%2F0963721414547737).
- Paulhus, D. L., & Buckels, E. E. (2011). *The Dark Tetrad of personality: Relevance to terrorist groups*. Toronto, Canada: Defense Research and Development Canada (DRDC) agency.
- Paulhus, D. L., & Williams, K. M. (2002). The dark triad of personality: Narcissism, Machiavellianism, and psychopathy. *Journal of Research in Personality*, *36*, 556–563. [https://doi.org/10.1016/S0092-6566\(02\)00505-6](https://doi.org/10.1016/S0092-6566(02)00505-6).
- Plich, R. (2010). Nadmierne pożądanie dobrych rzeczy. [Excessive desire for good things.]. *W Drodze*, *3*, 22–26.
- Pyda, J. (2010). Nieumiarkowanie. [Intemperance.]. *W Drodze*, *3*, 52–60.
- Raskin, R., & Hall, C. S. (1981). The Narcissistic Personality Inventory: Alternative form reliability and further evidence of construct validity. *Journal of Personality Assessment*, *45*, 159–162. https://doi.org/10.1207/s15327752jpa4502_10.
- Rau, R., Carlson, E. N., Back, M. D., Barranti, M., Gebauer, J. E., Human, L. J., ... Nestler, S. (2019). What is the structure of perceiver effects? On the importance of global positivity and trait-specificity across personality domains and judgment contexts. *Journal of Personality and Social Psychology*. <https://doi.org/10.1037/pspp0000278> Advance online publication.
- Rauthmann, J. F. (2012). The Dark Triad and interpersonal perception: Similarities and differences in the social consequences of narcissism, Machiavellianism, and psychopathy. *Social Psychological and Personality Science*, *3*, 487–496 (doi:10.1177%2F1948550611427608).
- Rauthmann, J. F., & Kolar, G. P. (2012). How “dark” are the Dark Triad traits? Examining the perceived darkness of narcissism, Machiavellianism, and psychopathy. *Personality and Individual Differences*, *53*, 884–889. <https://doi.org/10.1016/j.paid.2012.06.020>.
- Rentsch, K., & Gebauer, J. E. (2019). On the popularity of agentic and communal narcissists: The tit-for-tat hypothesis. *Personality and Social Psychology Bulletin*, *45*, 1365–1377. <https://doi.org/10.1177/0146167218824359>.
- Revelle, W., & Wilt, J. (2013). The general factor of personality: A general critique. *Journal of Research in Personality*, *47*, 493–504. <https://doi.org/10.1016/j.jrp.2013.04.012>.
- Rogoza, R. (2018). Narcissist unmasked. Looking for the narcissistic decision-making mechanism: a contribution from the Big Five. *Social Psychological Bulletin*, *13*, e26623. <https://doi.org/10.5964/spb.v13i2.26623>.
- Rogoza, R., & Cieciuch, J. (2018). Dark Triad traits and their structure: An empirical approach. *Current Psychology*. <https://doi.org/10.1007/s12144-018-9834-6> Advance online publication.
- Rogoza, R., Cieciuch, J., & Strus, W. (2019). A three-step procedure for analysis of circumplex models: An example of narcissism located within the circumplex of personality metatraits. *Personality and Individual Differences*, 109775. Advance online publication. <https://doi.org/10.1016/j.paid.2019.109775>.

- Rogoza, R., Ciecuch, J., Strus, W., & Baran, T. (2019). Seeking a common framework for research on narcissism: An attempt to integrate the different faces of narcissism within the circumplex of personality metraits. *European Journal of Personality, 33*, 437–455. <https://doi.org/10.1002/per.2206>.
- Rogoza, R., Kowalski, C. M., & Schermer, J. A. (2019). Dark Triad traits within the framework of the Circumplex Model of Personality Metraits. *Journal of Individual Differences, 40*, 168–176. <https://doi.org/10.1027/1614-0001/a000289>.
- Rogoza, R., Żemojtel-Piotrowska, M., & Campbel, W. K. (2018). Measurement of narcissism: From classical applications to modern approaches. *Stud. Psychol. Theoria et praxis, 1*, 27–48.
- Rogoza, R., Żemojtel-Piotrowska, M., Rogoza, M., Piotrowski, J., & Wysznińska, P. (2016). Narcissistic admiration and rivalry in the context of personality metraits. *Personality and Individual Differences, 102*, 180–185. <https://doi.org/10.1016/j.paid.2016.07.003>.
- Safranski, R. (1999). In E. Osers (Ed.). *Martin Heidegger: Between good and evil* Cambridge, Massachusetts: Harvard University Press Trans.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online, 8*, 23–74.
- Schönbrodt, F. D., & Perugini, M. (2013). At what sample size do correlations stabilize? *Journal of Research in Personality, 47*, 609–612. <https://doi.org/10.1016/j.jrp.2013.05.009>.
- Schönemann, P. H. (1966). A generalized solution of the orthogonal Procrustes problem. *Psychometrika, 31*, 1–10. <https://doi.org/10.1007/BF02289451>.
- Storoška, M. (2018). The book of genesis as foundation for the European civilization's concept of social help. *European Journal of Science and Theology, 14*, 61–74.
- Strus, W., & Ciecuch, J. (2017). Towards a synthesis of personality, temperament, motivation, emotion and mental health models within the Circumplex of Personality Metraits. *Journal of Research in Personality, 66*, 70–95. <https://doi.org/10.1016/j.jrp.2016.12.002>.
- Strus, W., Ciecuch, J., & Rowiński, T. (2014). The circumplex of personality metraits: A synthesizing model of personality based on the big five. *Review of General Psychology, 18*, 273–286 (doi:10.1037%2Fgpr0000017).
- Topolewska-Siedzik, E., Ciecuch, J., & Strus, W. (2019). Personality underpinnings of identity: The role of metraits and traits in identity formation modes. *Self and Identity, 18*, 529–549. <https://doi.org/10.1080/15298868.2018.1483964>.
- Veselka, L., Giammarco, E. A., & Vernon, P. A. (2014). The Dark Triad and the seven deadly sins. *Personality and Individual Differences, 67*, 75–80. <https://doi.org/10.1016/j.paid.2014.01.055>.
- Vrabel, J. K., Zeigler-Hill, V., McCabe, G. A., & Baker, A. D. (2019). Pathological personality traits and immoral tendencies. *Personality and Individual Differences, 140*, 82–89. <https://doi.org/10.1016/j.paid.2018.02.043>.
- Wetzel, E., Leckelt, M., Gerlach, T. M., & Back, M. D. (2016). Distinguishing subgroups of narcissists with latent class analysis. *European Journal of Personality, 30*, 374–389. <https://doi.org/10.1002/per.2062>.
- Widiger, T. A., Sellbom, M., Chmielewski, M., Clark, L. A., DeYoung, C. G., Kotov, R., ... Wright, A. G. C. (2019). Personality in a hierarchical model of psychopathology. *Clinical Psychological Science, 7*, 77–92. <https://doi.org/10.1177/2167702618797105>.
- Wright, A. G. C., Pincus, A. L., Conroy, D. E., & Hilsenroth, M. J. (2009). Integrating methods to optimize circumplex description and comparison of groups. *Journal of Personality Assessment, 91*, 311–322. <https://doi.org/10.1080/00223890902935696>.
- Wright, A. G. C., Thomas, K. M., Hopwood, C. J., Markon, K. E., Pincus, A. L., & Krueger, R. F. (2012). The hierarchical structure of DSM-5 pathological personality traits. *Journal of Abnormal Psychology, 121*, 951–957. <https://doi.org/10.1037/a0027669>.
- Wurst, S. N., Gerlach, T. M., Dufner, M., Rauthmann, J. F., Grosz, M. P., Küfner, A. C., ... Back, M. D. (2017). Narcissism and romantic relationships: The differential impact of narcissistic admiration and rivalry. *Journal of Personality and Social Psychology, 112*, 280–306. <https://doi.org/10.1037/pspp0000113>.
- Zawadzki, B. (2017). The location of personality disorders in the Circumplex of Personality Metraits. *Annals of Psychology, 20*, 493–512. <https://doi.org/10.18290/rpsych.2017.20.2-7en>.
- Zimmermann, J., & Wright, A. G. C. (2017). Beyond description in interpersonal construct validation: Methodological advances in the circumplex structural summary approach. *Assessment, 24*, 3–23. <https://doi.org/10.1177/1073191115621795>.
- Zuckerman, M. (2003). Biological bases of personality. In T. Millon, M. J. Lerner, & I. B. Weiner (Vol. Eds.), *Handbook of psychology: Personality and social psychology. Vol. 5. Handbook of psychology: Personality and social psychology* (pp. 85–116). New York, NY, US: John Wiley & Sons, Inc. <https://doi.org/10.1002/0471264385.wei0504>.