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The Dark Triad Traits and Problematic Internet Use: Their Structure and Relations

Abstract: The term "problematic Internet use" (PIU) refers to excessive online activities and is a major social concern. Despite various sociological, psychological, and interdisciplinary studies, the risk factors related to PIU remain unclear. As psychological traits are associated with online behavior, they are often seen as potential risk factors of PIU. However, the dark personality traits (which include narcissism, Machiavellianism, and psychopathy) and their relation to problematic Internet use are only partially recognized. These traits are commonly known as the Dark Triad, and even though they have been widely researched their structure is still under discussion. This study investigates both the structure of the Dark Triad and the triad's relation to PIU. A total of 384 participants were surveyed by online questionnaire. Our results suggest that the 3-component structure of the dark traits may be more suitable for research into online activity than a dark dyad. Moreover, the Dark Triad traits are related to high PIU levels.

Keywords: online behavior, Dark Triad, problematic Internet use, psychological traits, narcissism, Machiavellianism, psychopathy, personality.

Introduction

Ever since the Internet began revolutionizing everyday life, enhancing social and economic well-being, it has had a particularly negative impact on some part of society, that is, there are people whose poor personal control of their Internet use has become a matter of concern. This has sparked a wide field of sociological research, which also draws from other sciences, such as psychology, computer science, and neurobiology (Asrese & Muche 2020; Dahl & Bergmark 2020). "Problematic Internet use" (PIU) refers to a condition where people's difficulty in controlling their Internet use negatively influences their social life, relationships, and mental health (Sakakihara et al. 2019). Risk factors related to PIU remain unclear, but psychological traits are seen as potential vulnerability factors for this phenomenon (Pettorruso et al. 2020).

Personality traits form online behavior and, concomitantly, online activities affect an individual's personality (Kayiş et al. 2016; Xu et al. 2016). Being a theoretical foundation for studies on addictive behavior, the I-PACE (Interaction of Person-Affect-Cognition-Execution) model draws attention to personality traits that may play an important role in the use or overuse of specific online behavior (Brand et al. 2019; Sindermann et al. 2018).

The same model, along with the HEXACO (Honesty-Humility, Emotionality, Extraversion, Agreeableness, Conscientiousness, and Openness to Experience) personality dimensions, associates personality with the development and maintenance of problematic Internet use (Kircaburun & Griffiths 2018). As it is possible that people transfer their offline behavior to online ones in an attempt to compensate for unmet needs in the real world, an individual's personality is a determinant for online behavior and should be taken into consideration (Kircaburun & Griffiths 2018; Kardefelt-Winther 2014). To understand the role of personality traits in forming online behavior, reference should also be made to Problem Behavior Theory (PBT). Although initially proposed for offline deviant behavior, in recent studies PBT has been used to elucidate problematic online behavior: in this connection, the fact that engaging in one problematic online behavior increases the chances of engaging in another has been noted (Kircaburun et al. 2018a; Kircaburun et al. 2018b; Kircaburun et al. 2018c; Gámez-Guadix et al. 2016). There has been a recent rise in interest in the darker side of human personalities, including how personality traits relate to and predict behavior. This, along with increases in the prevalence of internet activities and growing knowledge about the negative consequences of such use, has produced a need to understand how these traits relate to online behavior, especially antisocial ones (Moor & Anderson 2019). According to Moor and Anderson (2019), antisocial online behavior is any deviant behavior—or the deliberate absence of proper behavior—that is committed online and has negative online or offline consequences for the target (including self-directed behavior). The traits of narcissism, psychopathy, and Machiavellianism are known to predict such behavior.

These traits are commonly known as the Dark Triad. Narcissism, which is complex, may include the elements of grandiosity or vulnerability. Grandiose narcissism is characterized by aggressive and dominant tendencies, while vulnerable narcissism (also known as hypersensitive narcissism) manifests as a defensive grandiosity aimed at hiding a feeling of inadequacy (Moor & Anderson 2019; Carrotte & Anderson 2019). At the sub-clinical level, highly narcissistic individuals are distinguished by a grandiose, self-centered outlook, extraversion, a sense of entitlement, lack of empathy, and egotism. Narcissists are charming, entertaining, assertive, attention-seeking, highly concerned about their physical appearance, vain, exhibitionist, self-aggrandizing, socially insensitive, selfish, hostile, aggressive, denigrating, and likely to experience considerable dislike as their acquaintances become older (McCain & Campbell 2018; Lowe-Calverley & Grieve 2017; Wang 2017; Jonason et al. 2015). The model of narcissism developed by Ackerman et al. (2011) infers two aspects of this trait: adaptive and maladaptive. The first refers to self-perceived leadership abilities, while the latter involves a sense of self-absorption, of vanity as well as exhibitionism (Rogoza & Cieciuch 2018). Despite the fact that narcissistic characteristics often manifest in anti-social behavior, narcissism is often perceived as the "brighter" of the dark traits (Moor & Anderson 2019).

Machiavellianism is the only one of the Dark Triad that does not possess a clinical equivalent in either DSM or ICD (Rogoza & Cieciuch 2018). The Machiavellian personality is characterized by goal-orientation, cynicism, deception, emotional detachment, low empathy, self-enhancement, disregard for morality, and a tendency to manipulate, deceive, and exploit others (Abell & Brewer 2014; Christie & Geis 1970). Manipulation is one of the crucial elements of a Machiavellian personality (Rogoza & Cieciuch 2018). Those

scoring high in Machiavellianism differ from those high in psychopathy in their strategic flattery and lies. Still, these two traits are symptomatically similar (Moor & Anderson 2019).

The psychopathic trait is defined by pleasure and power-seeking, a grandiose sense of self-worth, a desire for relative social positioning, group-based dominance, shallow affect, glib speech, superficial charm, grandiose self-worth, pathological lying, manipulation and deception, promiscuous behavior, and a parasitic lifestyle. Psychopaths are anti-social, selfish, impulsive, stimulation-seeking, and callous. They lack remorse, empathy, sense of guilt, or personal affect, and they also display poor behavioral control, criminal versatility, and juvenile delinquency (Rogoza & Cieciuch 2018; Craker & March 2016; Jonason et al. 2015; Neal & Sellbom 2012). People with the traits of Machiavellianism or psychopathy have similar affective, behavioral, and cognitive characteristics and desires; the structures of the traits are closely related due to a theoretical overlap. While people with either trait display emotional detachment, low remorse, manipulation, exploitation, antisocial tendencies, egocentricity, a negative view of people and the world, self-interest, and agentic orientations, people with Machiavellian or psychopathic traits differ in impulse-control abilities (Rogoza & Cieciuch 2019; Rogoza & Cieciuch 2018; Vize et al. 2018). Manifestations of psychopathy may appear more sinister when compared to narcissism; furthermore, psychopathy and Machiavellianism are the "darker" personality traits (Moor & Anderson 2019; Rauthmann & Kolar 2012).

The Dark Triad comprises the three personality traits, but their correlation seems unclear. In the definition proposed by Paulhus and Williams (2002), the Dark Triad is described as a constellation of three overlapping, undesirable, and antisocial personality constructs. Instead of "overlapping," Sindermann et al. (2018) use the term "intercorrelated." Moor and Anderson (2019) describe the Dark Triad as a trinity of personality traits which are typically considered to be socially undesirable, without mentioning their relations at all. As the Dark Triad's components were selected due to their common elements (aggressiveness, social aversion, self-promotion, and emotional withdrawal), they are not based upon any rigid criteria, and the Dark Triad structure remains complicated and multidimensional (Rogoza & Cieciuch 2018). Some researchers emphasize a need for further empirical research to prove that the Dark Triad should be expanded (Kircaburun et al. 2018c; van Geel et al. 2017; Marcus & Zeigler-Hill 2015; Buckels et al. 2014; Visser et al. 2014). On the other hand, considering the above-mentioned similarity of psychopathy and Machiavellianism, as well as the fact that narcissism manifests quite distinctly, the Dark Triad could be reduced to a Dark Dyad by treating these two traits as two facets of one construct and perceiving narcissism as an independent one (Moor & Anderson 2019; Rogoza & Cieciuch 2018).

This paper aims at appraising the Dark Triad's structure through validating the relations between each trait and the online behavior that are typical of them. Inspired by the results of the above-mentioned studies that suggest the Dark Triad could be reduced to two dimensions, we wanted to check the connections between its components in the context of online behavior. The first hypothesis was thus that online behavior associated with Machiavellianism more often overlap with those associated with psychopathy than with narcissism. We assume that Machiavellianism and narcissism to some extent overlap with psychopa-

thy. This means that online activities characteristic of narcissism and Machiavellianism can also be observed among people showing psychopathic tendencies. If we illustrated this in a Venn diagram, where the online behavior peculiar to Machiavellianism and psychopathy were put inside circles, the common part is the overlap. The first hypothesis states that the number of online behavior typical of Machiavellianism and psychopathy will be higher than the number of online behavior peculiar to psychopathy and narcissism. This hypothesis is based primarily on the works of Rogoza and Cieciuch (2018), as well as on Moor and Anderson (2019) on the similarity of Machiavellianism and psychopathy, but it transfers these assumptions to the field of online behavior.

The Dark Triad has been studied in order to seek a relation between those traits and antisocial online behavior, including trolling, cyber-aggression, cyber-loafing, cyberbullying, cyberstalking, sexual violence, odd status updates, technology facilitated infidelity, sending sexual content and explicit images, pornography, problematic online gaming, problematic social media use, and problematic Internet use (Moor & Anderson 2019; Kircaburun et al. 2018c; Kircaburun & Griffiths 2018; Casale & Fioravanti 2018; Craker & March 2016; Abell & Brewer 2014; Shim et al. 2007). Although research has shown that personality traits play a crucial role in problematic Internet use, the relationship between the Dark Triad and this phenomenon requires further investigation (Kircaburun & Griffiths 2018). There are various terms to describe problematic Internet use: Internet addiction, digital addiction, cyber addiction, Internet use disorder, excessive Internet use, Internet dependency, and compulsive Internet use (Sindermann et al. 2018; Kircaburun & Griffiths 2018). In this paper the term "PIU" has been chosen to describe a range of similar online activities that can be addictive, compulsive, or excessive, and lead to preoccupation with the Internet, along with loss of time control and impairment of social life, health, duties, and well-being (Kircaburun & Griffiths 2018; Spada 2014). According to studies, young people may be particularly vulnerable to PIU due to their higher rates of daily Internet use, which can result in psychological dysfunctions, depression, anxiety, stress, loneliness, and deterioration of well-being (Kircaburun & Griffiths 2018; Anderson et al. 2017; Ostovar et al. 2016; Kuss et al. 2014).

The Dark Triad traits have exceptional features that may cause PIU: a grandiose sense of self-importance, superiority, and entitlement (narcissism); deceptive, manipulative, and exploitative tendencies; fear of social rejection (Machiavellianism); dysfunctional impulsivity; and the need for extra stimulation and sensation (psychopathy) (Chung et al. 2019; Kircaburun et al. 2018c; Sindermann et al. 2018; Kuss & Griffiths 2011; Rauthmann 2011; Corry et al. 2008; Shim et al. 2007; Christie & Geis 1970). Moreover, as PIU may be a consequence of already existing offline psychopathologies which have been transferred to the online world, where it is easy to receive a direct reinforcement, the Dark Triad may be positively linked to PIU (Sindermann et al. 2018). Several studies have investigated the possible relations between the dark traits and PIU. Some of the studies proved these associations: Kircaburun and Griffiths (2018) found a direct relation between narcissism and PIU, as well as a direct and indirect connection between Machiavellianism and PIU. According to a study conducted by Chung et al. (2019), psychopathy was the only one of the Dark Triad traits positively associated with a specific PIU, namely problematic social media use. Kircaburun et al. (2018b), however, wrote that the effect of psychopathy was negligible,

while narcissism and Machiavellianism positively predicted problematic social media use. Sindermann et al. (2018) pointed to relations between Machiavellianism, psychopathy, and PIU, without any robust pattern of association with narcissism. In the above-cited studies, the Dark Triad traits may be related directly or indirectly to PIU. Different dark personality traits cause individuals to perform various online activities and to receive gratification from them. This may lead to repeated and problematic use of the Internet. Hence, it is expected that the dark personality traits will relate to PIU through the indirect pathways of particular online activities (Kircaburun & Griffiths 2018). Another study conducted by Kircaburun et al. (2018c), where narcissism was indirectly related (via cyberstalking) with problematic social media use, is a good example; Machiavellianism was directly associated with cyberbullying, trolling, and cyberstalking, and indirectly (also through cyberbullying and cyberstalking) with problematic social media use, while psychopathy was directly associated with cyberbullying and trolling without any indirect associations. Despite the different results, researchers agree that there has been insufficient study of the impact of dark personality traits on PIU, and thus there is a need for further investigation (Sindermann et al. 2018; Kircaburun & Griffiths 2018).

This paper concentrates on possible relations between the Dark Triad traits and online behavior equated with PIU. The basic compounds of these traits, such as lower conscientiousness, aggression, callousness, greater sensational interest, low agreeableness, higher dissociation, and borderline personality features are related with PIU (Kircaburun & Griffiths 2018; Trumello et al. 2018; Lu et al. 2017; Kayiş et al. 2016; Richardson & Boag 2016; Dalbudak et al. 2014; James et al. 2014; Douglas et al. 2012). Therefore, as the Dark Triad may be associated with PIU, our second hypothesis is that higher levels of Dark Triad traits are associated with greater PIU.

Methods

Sample and Procedure

In order to investigate the relation between the Dark Triad, PIU, and online behavior, a questionnaire survey was conducted among people born between 1980 and 2000. The study was conducted using the Computer Assisted Web Interviewing (CAWI) method. The sample was non-random, consisting of people aged 18–38 from six regions of Poland (in the north, northwest, center, southwest, south, and east), who registered in a research panel. As young people have constant access to the Internet, the main limitation of this method is no longer relevant. Thanks to this technique, errors and the influence of the interviewer on the survey are eliminated, and the respondents can fill in the questionnaire at any time and place without time limits. The method is conducive to maintaining anonymity, which may positively affect the reliability of responses. Visual elements can be applied, and the cost of a study conducted on the basis of this method is small. The disadvantages, however, are the researcher's inability to control interfering factors and uncertainty over whether a questionnaire was answered by a given respondent. The total number of participants was 384. Each was familiarized with the range and aim of the study. Informed consent was obtained from

the participants before they completed the online questionnaire. The data was collected in February 2018.

Measures

Narcissism was measured using the 40-item Narcissism Personality Inventory (NPI) (Raskin & Terry 1988) assessing seven components of narcissism: authority (M = 3.53, SD = 2.098, Cronbach's $\alpha = .80$), self-sufficiency (M = 2.41, SD = 1.335, Cronbach's $\alpha = .79$), exhibitionism (M = 1.96, SD = 1.753, Cronbach's $\alpha = .80$), entitlement (M = 1.9, SD = 1.468, Cronbach's $\alpha = .79$), superiority (M = 1.74, SD = 1.366, Cronbach's $\alpha = .78$), vanity (M = 1.04, SD = 1.095, Cronbach's $\alpha = .82$), and exploitativeness (M = 1.67, SD = 1.296, Cronbach's $\alpha = .80$). Machiavellian traits were assessed with the Mach IV (Christie & Geis 1970) using a 5-point Likert scale (1—"strongly disagree," 5—"strongly agree"): cynicism (M = 30.74, SD = 4.128, Cronbach's $\alpha = .64$), morality (M = 5.65, SD = 1.649, Cronbach's $\alpha = .72$), and manipulative behavior (M = 22.32, SD = 4.061, Cronbach's $\alpha = .71$). Psychopathic traits were assessed using Levenson's Self-Report Psychopathy Scale (LSRP) (Levenson, Kiehl & Fitzpatrick 1995). This 26-item construct assesses primary psychopathy (M = 39.87, SD = 3.335, Cronbach's $\alpha = .74$) and secondary psychopathy (M = 24.17, SD = 2.946, Cronbach's $\alpha = .72$). Primary psychopathy refers to core features of psychopathy including lack of guilt or remorse, manipulativeness, callousness, and so forth, while secondary psychopathy includes antisocial behavior and traits like irresponsibility, sensation-seeking, and impulsiveness. The subjects responded on a 4-point Likert scale (1—"strongly disagree," 4—"strongly agree"). To measure the PIU level, the classical Internet Addiction Test (IAT) (Young 1998) was used (M = 32.49, SD = 16.974, Cronbach's $\alpha = .77$). It is a 20-item measure, using a 5-point Likert scale (1—"strongly disagree," 5—"strongly agree," with the option of 0—- "does not apply"). Scores that did not exceed 49 points were perceived as non-problematic use (N = 231, 60.2%). Between 50 and 79 indicated a medium level of PIU (N = 93, 24.2%), while over 80 points signaled a high level of PIU (N = 60, 15.6%).

Online Behavior

This part was developed for the purposes of our research, on the basis of several studies of online behavior and dark traits (Kircaburun et al. 2018b; Kircaburun & Griffiths 2018; Sindermann et al. 2018; Casale & Fioravanti 2018; Arpaci 2018; Andreassen et al. 2017; Pantic et al. 2017; Ladanyi & Doyle-Portillo 2017; van Geel et al. 2017; Smoker & March 2017; Richardson & Boag 2016; Fox & Rooney 2015; Kasper et al. 2015; Kuss et al. 2014; Király et al. 2014; Abell & Brewer 2014; Buckels et al. 2014; Corry et al. 2008; Kim et al. 2008; Shim et al. 2007; Lin & Tsai 2002). First, a 23-item construct examined narcissistic, Machiavellian, and psychopathic behavior, and those typical for PIU (Table 1), using a 4-point Likert scale, from 1—"strongly disagree" to 4—"strongly agree." Some behavior may occur for more than one personality trait. For the transparency of our analysis, we decided to assign (based on psychological tests measuring these traits) each behavior to only one group.

Table 1

Analysed Online Behavior

Behavior associated with narcissism	**Behavior associated with Machiavellianism**
1. Possessing a public Instagram profile.	1. Using a fictional online identity.
2. Craving for likes, followers and other signs of online popularity.	2. Feeling anonymous and unpunishable online.
3. Running a (video)blog.	3. Wanting to hack a website.
4. Feeling like an online celebrity.	4. Using the Internet for achieving own purposes.
5. Enjoying making acquaintances online.	5. Manipulating other people online.
	6. Possessing a sense of power online.
Behavior associated with psychopathy	**Behavior associated with Internet addiction**
1. Online hating.	1. Feeling frustrated on SNSs.
2. SNSs stalking or harassing.	2. Feeling happy online.
3. Behaving in a disinhibited manner online.	3. Excessive online shopping.
4. Being aggressive online.	4. Preferring online reality than actual reality.
5. Exploring erotic/pornographic content.	5. Spending one's majority of free time online.
6. Gambling.	6. Rejecting everyday life without the Internet.

Data Analysis

Data analysis was made with SPSS and Statistica software. First, descriptive statistics were calculated to illustrate the sample's structure. For verification of the first hypothesis, the Mann-Whitney U test or the Kruskal-Wallis H test was used—depending on the number of grouping factors—for continuous variables, a *chi*-square, Fisher test, and the Pearson's correlation coefficient for measuring the relationships were used. The level of signifiers was presented using three levels: $p < .05$, $p < .01$, and $p < .001$. The influence of individual characteristics (narcissism, Machiavellianism, psychopathy, Internet addiction) on online behavior was estimated using the logistic regression model. The respondents answered primarily on a 4-point Likert scale (1—"strongly disagree" to 4—"strongly agree"); however, their responses were aggregated to a dichotomous scale in order to adapt them to the analysis requirements as follows: "strongly disagree" and "rather disagree" were aggregated into one category corresponding to the lack of a given behavior; "strongly agree" and "rather agree" were aggregated into one category corresponding to the occurrence of a given behavior. Explanatory variables were expressed in quantitative form, using the exact numerical values of indices: narcissism, Machiavellianism, psychopathy, and Internet addiction. Overlap was calculated as follows: for each psychological trait all analyzed online behavior with $p < 0.05$ were taken into consideration. If such a behavior was found to be related to narcissism and psychopathy or Machiavellianism and psychopathy, it was counted as a single overlap. Thus the total number of behavior related to both traits was an overlap for this pair.

The second hypothesis was verified using Pearson's r correlation coefficient, which is also called the linear correlation coefficient.[1] Pearson's linear correlation coefficient requires at least two variables to be measured on an interval scale (in our case, the analyzed

[1] For each of the characteristics, the Kruskal-Wallis ANOVA analysis was performed, where the grouping variable was PIU levels (low, medium, high). The results showed significant differences between the groups; mean ranks also showed low levels of variables for low PIU, medium for medium PIU, and high for high PIU in each case. The jumps between these levels were also similar. In addition, scatterplots were created for all variables and they indicated that the tested compounds were well described by a linear function.

variables are quantitative), which determines the degree of proportional relations between the values of two variables. The term "proportional" means linearly dependent, that is, the correlation is strong if it can be described with a straight line. The strength of the relationship is determined on the basis of Pearson's linear correlation coefficient, in accordance with J. Guilford's classification (1965). Pearson's *r* correlation coefficients and correlation coefficient significance tests were calculated using Statistica, assuming the significance level for all statistics $\alpha = 0.05$.

Results

The demographic and descriptive statistics are provided below (Tables 2 and 3). The mean for narcissism amounted to 14.46 (SD = 7.047), which in comparison with Raskin & Terry's (1988) study may be perceived as an average level of this trait among subjects. Machiavellianism and psychopathy scored relatively high M = 58.7, SD = 7.757; M = 64.04, SD = 4.571, respectively. Mean value for PIU was 32.49 with SD = 16.974.

Table 2

Demographic Data

Variable	N	%
Gender		
1. Female	195	50.8
2. Male	189	49.2
Age		
1. 18–24	113	29.4
2. 25–30	131	34.1
3. 31–37	140	36.5
Region		
1. North	61	15.9
2. North-West	64	16.7
3. Central	77	20.1
4. East	66	17.2
5. South-West	36	9.4
6. South	80	20.8

Hypothesis 1: Online behavior associated with Machiavellianism more often overlap with those associated with psychopathy than with narcissism.

Tables 4–6 presents online behavior related to narcissism, Machiavellianism, and psychopathy accordingly. A higher mean than in other columns suggests that subjects with a particular psychological trait declared they had more often performed an activity and a lower mean indicates that they less often performed the activity (in accord with a particular Likert-scale value—"strongly disagree," "rather disagree," "rather agree," and "strongly agree"). A higher mean value in each column indicates a higher level of a given component

Table 3

Descriptive Statistics

Trait	N	Mean	SD	Min	Quartile 1	Median	Quartile 3	Max
Narcissism total	384	14.46	7.047	0	9	14	19	34
Authority	384	3.53	2.098	0	2	4	5	8
Self-sufficiency	384	2.41	1.335	0	1	2	3	6
Superiority	384	1.74	1.366	0	1	2	3	5
Exhibitionism	384	1.96	1.753	0	0	2	3	6
Exploitativeness	384	1.67	1.296	0	1	2	3	5
Vanity	384	1.04	1.095	0	0	1	2	3
Entitlement	384	1.9	1.468	0	1	2	3	6
Machiavellianism total	384	58.7	7.757	35	54	59	63	79
Manipulative behavior	384	22.32	4.061	11	20	22.5	25	34
Morality	384	5.65	1.649	2	5	6	7	10
Cynicism	384	30.74	4.128	17	28	30	34	43
Psychopathy total	384	64.04	4.571	49	61	64	67	78
Primary psychopathy	384	39.87	3.335	31	38	40	42	49
Secondary psychopathy	384	24.17	2.946	16	22	24	26	32
Internet addiction total	384	32.49	16.974	0	20	32	43.25	95

	N	%
No Internet influence on user	93	24.2
Frequent problems with excessive online activity, high risk of Internet addiction	60	15.6
Average Internet usage	231	60.2

	N	Mean	SD	Min	Quartile 1	Median	Quartile 3	Max
Number of friends on Facebook								
%	384	297.71	343.443	0	120	250	400	5.000
Number of followers on Instagram								
%	384	72.14	228.642	0	0	0	56.75	3.497
Number of subscribers on YouTube								
%	384	27.54	284.423	0	0	0	0	5.445
Average free time spent online daily (hours)								
%	384	4.27	2.689	0	2	4	5	18

of the Dark Triad (in the following tables—narcissism, Machiavellianism, psychopathy); participants with the highest level of each of these features most often selected the answer on the Likert scale that indicated the greatest intensity of a given behavior. For example, in Table 4, the behavior "craving for 'likes,' followers, and other signs of online popularity" was most commonly displayed by respondents with the highest levels of narcissism. The data presented in the following tables (4–6) shows that the majority of online behavior analyzed were associated with one or more Dark Triad traits.

Out of 23 of the online behavior analyzed, most were associated ($p < 0.05$) with all three components of the Dark Triad: 20 with narcissism, 17 with Machiavellianism, and 22 with psychopathy. When analyzing overlaps, 19 behavior were associated with both narcissism and psychopathy. From this set, 13 behavior had the same direction of dependence, observed at the highest level of a given psychological trait showing the same answer from the

Table 4

Online behavior associated with narcissism (the Kruskal-Wallis H test results)

Online behavior	p-value	Narcissism			
		Strongly disagree	Rather disagree	Rather agree	Strongly agree
Possessing a public Instagram profile	p < 0.001	13.1 (7.097) 12 (1–34)	**17.21 (6.131)** **18 (0–30)**	16.56 (5.858) 17 (3–29)	15.25 (7.422) 14.5 (1–31)
Craving for likes, followers and other signs of online popularity	p < 0.001	12.41 (6.503) 12 (1–32)	13.68 (6.938) 14 (0–31)	17.84 (6.815) 19 (1–34)	**18.06 (6.088)** **18 (7–29)**
Running a (video)blog	p < 0.001	13.42 (6.897) 13 (1–34)	17.15 (6.375) 18 (0–30)	17.07 (6.886) 19 (1–26)	**17.57 (7.089)** **17 (6–33)**
Feeling like an online celebrity	p < 0.001	13.21 (6.73) 13 (1–32)	17.07 (7.057) 17.5 (0–34)	19.22 (6.129) 21 (5–29)	**20.06 (5.87)** **20 (7–29)**
Online hating	p < 0.001	13.18 (6.87) 13 (1–34)	16.08 (6.988) 17 (0–33)	19.35 (5.104) 19 (9–31)	**20.06 (5.639)** **19.5 (7–29)**
SNSs stalking or harassing	p < 0.001	13.62 (6.995) 13 (1–33)	16.44 (7.376) 18 (0–34)	17.71 (5.178) 18 (4–26)	**19.85 (5.655)** **20 (7–29)**
Using a fictional online identity	p < 0.001	13.59 (7.12) 13 (1–34)	14.31 (6.937) 15 (0–30)	17.76 (5.957) 18 (2–29)	**17.8 (6.374)** **15.5 (9–29)**
Feeling happy online	p < 0.001	13.52 (6.849) 13 (1–28)	13.17 (6.92) 12.5 (0–32)	16.55 (6.801) 17 (2–34)	**16.71 (7.829)** **14.5 (4–29)**
Excessive online shopping	0.022	13.59 (6.654) 13 (2–31)	13.99 (7.539) 14 (0–34)	**16.38 (6.896)** **16.5 (1–31)**	15.82 (6.458) 15 (2–29)
Feeling anonymous and unpunished online	p < 0.001	13.82 (7.106) 13.5 (1–32)	13.72 (6.772) 13 (0–33)	17.08 (6.616) 17 (2–34)	**20.2 (6.529)** **21 (11–29)**
Being aggressive online	p < 0.001	13.36 (6.803) 13 (1–33)	15.75 (7.454) 17 (0–34)	18.86 (4.772) 19 (10–29)	**24.57 (3.867)** **26 (18–29)**
Enjoying making acquaintances online	0.01	14.25 (6.554) 14 (2–28)	13.23 (6.831) 13 (0–30)	14.62 (7.21) 15 (1–34)	**17.87 (7.237)** **18 (3–33)**
Exploring erotic/pornographic content	p < 0.001	12.97 (6.625) 12 (1–28)	13.65 (7.158) 13 (0–31)	16.37 (6.63) 17 (1–34)	**17 (7.821)** **17 (2–32)**
Gambling	p < 0.001	13.75 (6.936) 13 (1–33)	13.73 (7.613) 13 (0–34)	18.32 (4.992) 19 (5–26)	**19.92 (6.829)** **19 (9–31)**
Wanting to hack a website	p < 0.001	13.27 (6.853) 13 (1–33)	16.09 (7.452) 17 (0–34)	17.76 (5.882) 18 (2–32)	**19.31 (6.129)** **18.5 (10–31)**
Preferring online reality than real one	p < 0.001	13.61 (6.918) 13 (1–32)	15 (7.482) 15 (0–34)	19.54 (3.744) 20 (14–26)	**21.11 (4.676)** **19 (16–29)**
Spending the majority of free time online	0.044	14.06 (6.85) 13 (1–32)	13.73 (7.059) 14 (0–34)	**16.1 (7.153)** **16.5 (1–33)**	13.74 (7.117) 14 (2–26)
Rejecting everyday life without the internet	0.009	14.92 (6.977) 15 (1–32)	12.81 (6.791) 12 (0–29)	15.15 (6.997) 15 (2–34)	**16.61 (7.376)** **17 (2–31)**
Manipulating other people online	p < 0.001	12.99 (6.845) 12 (0–33)	15.59 (6.308) 16 (1–30)	**20.47 (6.34)** **21 (7–34)**	20.44 (4.447) 19 (14–27)
Possessing a sense of power online	p < 0.001	12.71 (6.711) 12 (1–32)	16.27 (6.677) 17 (1–31)	**19.42 (6.066)** **18 (5–34)**	18.25 (6.784) 19.5 (0–27)

Note: In columns "Strongly disagree," "Rather disagree," "Rather agree," and "Strongly agree" values depicts narcissism levels, including: mean (standard deviation) in a first row and median (Q1 and Q3) in a second. Number in bold are the highest narcissism level for each behavior.

Table 5

Online behavior associated with Machiavellianism (the Kruskal-Wallis H test results)

Online behavior	p-value	Machiavellianism			
		Strongly disagree	Rather disagree	Rather agree	Strongly agree
Craving for likes, followers and other signs of online popularity	0.002	57.71 (8.025) 57 (35–79)	57.89 (7.732) 59 (38–78)	60.45 (7.063) 60 (40–79)	**61.81 (7.049)** **62 (48–74)**
Feeling like an online celebrity	0.048	58.14 (8.261) 58 (35–79)	60.02 (5.916) 60 (46–79)	**61 (4.86)** **61 (50–74)**	60.5 (6.743) 60 (52–73)
Online hating	p < 0.001	57.41 (7.846) 57 (35–79)	60.63 (6.462) 60 (49–79)	63.12 (5.564) 62 (54–78)	**64.5 (7.563)** **61.5 (53–78)**
SNSs stalking or harassing	0.014	58.18 (8.251) 58 (35–79)	60.07 (6.691) 60 (48–77)	**61.65 (3.199)** **61 (57–68)**	59.46 (4.332) 60 (53–65)
Feeling frustrated on SNSs	0.016	57.34 (8.081) 57 (35–79)	59.92 (7.719) 60 (42–79)	57.88 (7.093) 58.5 (43–75)	**60.88 (7.207)** **61 (43–74)**
Behaving disinhibited online	p < 0.001	56.33 (7.584) 56 (35–79)	59.29 (7.736) 60 (38–78)	61.16 (6.926) 60 (46–79)	**62.87 (7.855)** **62 (46–78)**
Using a fictional online identity	p < 0.001	57.26 (8.124) 57 (35–79)	60.48 (6.645) 60 (40–77)	60.96 (6.569) 61 (43–75)	**64.6 (5.481)** **62.5 (60–78)**
Feeling anonymous and unpunished online	0.026	57.63 (8.126) 57 (35–79)	59.66 (7.572) 60 (38–79)	59.42 (6.902) 59 (40–78)	**62.1 (5.425)** **62 (53–70)**
Being aggressive online	p < 0.001	57.36 (7.962) 57 (35–79)	62.06 (6.256) 60 (52–77)	**63.17 (5.512)** **62 (54–78)**	59.14 (3.185) 60 (53–62)
Exploring erotic/pornographic content	p < 0.001	56.59 (7.414) 57 (35–73)	58.67 (6.446) 59 (40–77)	60.51 (8.177) 60 (44–79)	**62.38 (8.003)** **62 (43–78)**
Wanting to hack a website	p < 0.001	57.53 (8.229) 57 (35–79)	60.36 (5.995) 60 (44–75)	61.69 (5.008) 62 (52–73)	**64.12 (6.12)** **62 (55–76)**
Preferring online reality than real one	p < 0.001	57.69 (8.145) 58 (35–79)	61.45 (6.562) 60 (50–79)	60.12 (4.302) 60 (52–70)	**62.56 (5.615)** **62 (52–72)**
Spending the majority of free time online	p < 0.001	57.23 (8.396) 57 (38–79)	58.2 (6.5) 59 (35–75)	60.3 (7.573) 60 (40–79)	**65 (6.856)** **64 (54–78)**
Rejecting everyday life without the internet	p < 0.001	57.96 (8.004) 58 (40–76)	57.34 (6.949) 58 (38–75)	59.3 (7.416) 59 (42–79)	**63.16 (9.17)** **64.5 (35–78)**
Using the Internet for achieving own purposes	0.004	57.76 (7.204) 57.5 (43–74)	58.89 (7.017) 59 (43–78)	57.84 (8.209) 58 (38–79)	**61.73 (7.582)** **62 (35–75)**
Manipulating other people online	p < 0.001	56.98 (7.83) 57 (35–79)	61.19 (6.411) 60.5 (48–77)	**63.44 (6.872)** **61.5 (47–78)**	**63.44 (4.851)** **62 (58–73)**
Possessing a sense of power online	p < 0.001	57.05 (7.669) 57 (35–79)	60.69 (6.887) 60 (38–78)	**63.36 (7.268)** **62 (46–79)**	60.42 (7.154) 61.5 (47–73)

Note: In columns "Strongly disagree," "Rather disagree," "Rather agree," and "Strongly agree" values depicts Machiavellianism levels, including: mean (standard deviation) in a first row and median (Q1 and Q3) in a second. Number in bold are the highest Machiavellianism level for each behavior.

Likert scale. The 5 behavior had the same direction but different intensity, meaning that the highest levels of narcissism and psychopathy were affirmative responses but the one was expressed as "rather" and the other as "strongly agree" (for example, online hating was assigned to the level of "strongly agree" for narcissism and "rather agree" for psychopathy). One behavior—having a public Instagram account—went in the opposite direction, that is, narcissism was linked to not having an account and psychopathy was linked to having one.

Table 6

Online behavior associated with psychopathy (the Kruskal-Wallis H test results)

Online behavior	p-value	Psychopathy			
		Strongly disagree	Rather disagree	Rather agree	Strongly agree
Possessing a public Instagram profile	0.018	63.51 (4.18) 63 (49–75)	63.88 (4.538) 63 (51–72)	**65.36 (5.359)** **66 (51–78)**	64.71 (4.822) 65 (54–76)
Craving for likes, followers and other signs of online popularity	p < 0.001	63.26 (4.48) 63 (49–76)	63.71 (4.122) 64 (54–77)	65.15 (4.975) 66 (51–78)	**66.06 (4.516)** **66 (57–76)**
Running a (video)blog	0.024	63.66 (4.316) 64 (51–76)	63.83 (5.262) 64.5 (49–74)	65.83 (3.855) 66 (59–76)	**65.86 (5.584)** **66 (57–78)**
Feeling like an online celebrity	0.002	63.52 (4.288) 63 (49–76)	65.56 (4.277) 65 (57–77)	64.44 (5.079) 66 (51–74)	**67.69 (6.76)** **67.5 (54–78)**
Online hating	p < 0.001	63.52 (4.356) 63 (49–76)	64.17 (3.577) 64 (54–72)	**66.91 (6.012)** **68 (51–78)**	66.44 (5.304) 66.5 (55–76)
SNSs stalking or harassing	0.004	63.62 (4.293) 64 (49–76)	64.73 (4.632) 65 (54–77)	65.68 (5.224) 67 (51–76)	**67.85 (6.375)** **68 (59–78)**
Feeling frustrated on SNSs	0.01	62.95 (4.75) 62 (49–74)	64.39 (4.098) 65 (51–77)	**64.89 (4.573)** **64.5 (57–78)**	64.62 (5.609) 63 (56–76)
Behaving disinhibited online	p < 0.001	62.9 (4.587) 63 (49–77)	64.5 (4.589) 65 (51–76)	**64.84 (3.899)** **65 (56–78)**	67.07 (5.431) 66 (59–76)
Using a fictional online identity	p < 0.001	63.42 (4.239) 63 (51–76)	64.13 (4.338) 64 (51–73)	65.78 (5.191) 66 (49–77)	**68.4 (6.059)** **67.5 (62–78)**
Feeling happy online	0.001	62.49 (4.336) 62 (51–73)	64.18 (4.474) 65 (49–76)	64.9 (4.48) 64 (54–78)	**65.79 (5.536)** **65.5 (56–75)**
Excessive online shopping	0.007	63.21 (4.399) 63 (49–76)	64.06 (4.276) 64 (54–76)	64.84 (4.814) 64 (51–78)	**66.32 (5.07)** **66 (56–76)**
Feeling anonymous and unpunished online	p < 0.001	63.34 (4.441) 63 (49–76)	63.9 (4.082) 64 (54–74)	65.7 (5.133) 66 (51–78)	**69 (4.472)** **67.5 (63–76)**
Being aggressive online	p < 0.001	63.15 (4.185) 63 (49–76)	65.06 (4.368) 65 (51–73)	67.86 (4.312) 68 (59–77)	**71.29 (5.024)** **72 (63–78)**
Exploring erotic/pornographic content	0.048	63.58 (4.315) 63.5 (51–77)	64.01 (4.059) 64 (49–73)	63.98 (4.841) 64 (51–76)	**66.05 (5.323)** **66.5 (55–78)**
Gambling	0.003	63.62 (4.355) 64 (49–76)	63.98 (4.142) 64 (55–76)	65.32 (5.148) 65.5 (54–78)	**69.17 (5.638)** **69 (60–76)**
Wanting to hack a website	p < 0.001	63.37 (4.255) 63 (49–76)	64.64 (4.638) 65 (51–77)	65.98 (4.535) 66 (54–76)	**67.75 (6.159)** **67.5 (56–78)**
Preferring online reality than real one	p < 0.001	63.46 (4.134) 63 (51–76)	64.47 (4.808) 65 (49–73)	67 (5.215) 68 (54–78)	**69.89 (6.153)** **74 (62–76)**
Spending the majority of free time online	p < 0.001	62.86 (4.435) 63 (49–76)	64.51 (4.399) 64 (55–77)	64.95 (4.853) 65 (51–78)	**65.53 (3.238)** **66 (59–69)**
Rejecting everyday life without the internet	0.003	62.59 (4.67) 63 (49–73)	63.96 (4.245) 64 (54–76)	64.84 (4.793) 65 (51–78)	**65.26 (3.768)** **65 (58–74)**
Using the Internet for achieving own purposes	0.033	62.4 (4.741) 62.5 (51–73)	64.41 (5.052) 65 (49–78)	64.23 (4.27) 64 (54–75)	**64.65 (4.067)** **64.5 (57–76)**
Manipulating other people online	p < 0.001	63.39 (4.155) 63 (51–76)	64.28 (4.407) 64 (51–77)	66.08 (5.453) 67.5 (49–75)	**71.78 (4.41)** **72 (66–78)**
Possessing a sense of power online	p < 0.001	63.31 (4.264) 63 (51–76)	64.55 (4.165) 65 (49–73)	66.22 (5.823) 66 (51–78)	**67.17 (4.13)** **67.5 (62–74)**

Note: In columns "Strongly disagree," "Rather disagree," "Rather agree," and "Strongly agree" values depicts psychopathy levels, including: mean (standard deviation) in a first row and median (Q1 and Q3) in a second. Number in bold are the highest psychopathy level for each behavior.

In Machiavellianism and psychopathy, only 10 online behavior were equally related, and 7 had the same direction but a different intensity; thus the total number of overlapping activities was 17. All behavior classified as overlaps are presented in Table 7.

According to the above results, H1—that online behavior associated with Machiavellianism overlap more often with those associated with psychopathy than with narcissism—cannot be supported. The majority of the behavior analyzed showed associations with all three Dark Triad traits. The number of behavior related to narcissism and psychopathy was higher than the number of behavior related to the two traits of Machiavellianism and psychopathy or of narcissism and psychopathy. After removing one behavior with a different direction from the narcissism-psychopathy set, the total number is still higher than the total amount of behavior overlapping for Machiavellianism and psychopathy.

Table 7

Online behavior classified as overlaps

Narcissism and psychopathy overlaps	Machiavellianism and psychopathy overlaps
Possessing a public Instagram profile	Craving for likes, followers and other signs of online popularity
Craving for likes, followers and other signs of online popularity	Feeling like an online celebrity
Running a (video)blog	Online hating
Feeling like an online celebrity	SNSs stalking or harassing
Online hating	Feeling frustrated on SNSs
SNSs stalking or harassing	Behaving disinhibited online
Using a fictional online identity	Using a fictional online identity
Feeling happy online	Feeling anonymous and unpunished online
Excessive online shopping	Being aggressive online
Feeling anonymous and unpunished online	Exploring erotic/pornographic content
Being aggressive online	Wanting to hack a website
Exploring erotic/pornographic content	Preferring online reality than real one
Gambling	Spending the majority of free time online
Wanting to hack a website	Rejecting everyday life without the internet
Preferring online reality than real one	Using the Internet for achieving own purposes
Spending the majority of free time online	Manipulating other people online
Rejecting everyday life without the internet	Possessing a sense of power online
Manipulating other people online	
Possessing a sense of power online	

Hypothesis 2: higher levels of Dark Triad traits are associated with higher PIU.

Table 8 presents the correlation coefficients between PIU and the psychological features being analyzed. In the set, only one component of narcissism (self-sufficiency, $p = 0.195$)

was not included in the table. The remaining variables are characterized by positive correlation indicators. According to Guilford's classification, narcissism and its components should be described as weak correlations, where entitlement was the exception, with a correlation that can be considered average. Machiavellianism turned out to be strongly correlated with PIU, while its components were moderately correlated. Psychopathy was the most strongly correlated with PIU; however, as in the case of Machiavellianism, its individual components reached mean values of correlation coefficients.

Table 8

Correlation coefficients Pearson's r and correlation coefficient significance tests between analysed psychological traits and PIU

Psychological traits	Correlation coefficients	p-value
Narcissism	0.281	**0.000**
Authority	0.167	**0.001**
Self-sufficiency	0.066	0.195
Superiority	0.171	**0.001**
Exhibitionism	0.182	**0.000**
Exploitativeness	0.203	**0.000**
Vanity	0.116	**0.023**
Entitlement	0.330	**0.000**
Machiavellianism	0.570	**0.000**
Manipulative behavior	0.461	**0.000**
Morality	0.393	**0.000**
Cynicism	0.373	**0.001**
Psychopathy	0.618	**0.000**
Primary psychopathy	0.469	**0.000**
Secondary psychopathy	0.444	**0.000**

Note. p-values Lower than 0.05 are marked bold.

Discussion

The main aim of this paper was to investigate the Dark Triad's structure in regard to online behavior. Inspired by the work of Rogoza and Cieciuch (2018), we decided to test the similarities and differences between the Dark Triad traits. We also aimed to explore relations between the Dark Triad and PIU, on the inspiration of studies conducted by Chung et al. (2019), Moor and Anderson (2019), Kircaburun and Griffiths (2018), Kircaburun et al. (2018c), Sindermann et al. (2018), and others. We believe that including both—investigating the Dark Triad structure on the basis of online behavior and its possible relation to PIU—was an innovative aspect of our research. Of course, the pool of online behavior that was included in the study was still limited.

In terms of specific hypotheses, the prediction that online behavior associated with Machiavellianism overlap more often with those associated with psychopathy than with narcissism cannot be supported. It emerged that the majority of the behavior analyzed were related to all the Dark Triad traits and those that were not did not show any particular pattern that would suggest a similarity between Machiavellianism and psychopathy. These results

are consistent with the descriptions of the Dark Triad provided by Paulhus and Williams (2002), as well as by Sindermann et al. (2018). Still, these findings may vary due to the research sample and pool of online behavior, so further studies may show different results that would support the concept of the Dark Dyad. It should also be borne in mind that this study concerned only manifestations of the Dark Triad in the context of online activity.

This study instead supported the hypothesis that higher levels of Dark Triad traits are associated with higher PIU. All the Dark Triad's components were associated linearly with PIU: their highest levels were displayed by respondents with high PIU. Despite the lack of links between self-sufficiency and PIU, narcissism itself and its other components are part of this trend, although the correlations we found were average at most. Our results confirmed those made by Chung et al. (2019), Moor and Anderson (2019), Kircaburun and Griffiths (2018), Kircaburun et al. (2018c), and Sindermann et al. (2018). People scoring high on narcissism evince a tendency to promote themselves online, to behave aggressively, and also to be attention-seeking, vain, exhibitionist, self-aggrandizing, socially insensitive, and selfish (Kircaburun and Griffiths 2018; McCain & Campbell 2018; Lowe-Calverley & Grieve 2017; Wang 2017; Jonason et al. 2015). Strong correlations with PIU were evinced for Machiavellianism and psychopathy. Given that people with the trait of Machiavellianism can have difficulties in face-to-face interactions, they may prefer online communication. As they may also have low agreeableness and emotional intelligence, as well as high emotional manipulativeness and alexithymia, they may feel more comfortable online (Kircaburun and Griffiths 2018; Austin et al. 2007). People scoring high on the psychopathy scale behave impulsively, antisocially, selfishly, seek stimulation, and show no signs of remorse, empathy, or sense of guilt (Rogoza & Cieciuch 2018; Craker & March 2016; Jonason et al. 2015; Neal & Sellbom 2012). These psychological traits may increase a tendency toward PIU.

As a potential limitation of this study, it might be argued that we relied on self-reported indicators: we obtained only quasi-behavioral data and had no way of monitoring actual online behavior. Such studies can be less reliable and more biased. We were not able to control for the truthfulness of the data collected. Although the participants were encouraged to give honest answers, the possibility that they marked "preferable" ones cannot be ruled out. Nevertheless, data based on declarations has been proven valid in studies similar to ours (Kühberger, Schulte-Mecklenbeck & Perner 2002) and such an approach has been judged reasonable in assessing subjectively experienced symptoms of PIU (Sindermann et al. 2018). Second, although a compelling set of behavior was analyzed, the results may be different if another pool of online behavior was taken into consideration.

Avenues for future research include cross-cultural studies, as personality traits may vary across racial groups (Tanchotsrinon, Maneesri & Campbell 2007) and age groups. It would also be interesting to examine the relation between these psychological traits and other online behavior.

Conclusions

Despite its limitations, the above research has increased our knowledge of the Dark Triad and PIU. It showed that online activities may be influenced by Dark Triad psychological

traits, and that people with these traits may engage in problematic Internet use. Nonetheless, our study indicates that more focus should be given to the Dark Triad when considering its structure and possible relations to PIU. Such research could contribute to a better understanding of the sociological conditions of problematic Internet use today. Our study also indicates that as individuals with Dark Triad traits have increased chances of displaying aggressive and manipulative behavior, they may pose a threat to other participants in cyberspace.

References

Abell, L., Brewer, G. 2014. Machiavellianism, self-monitoring, self-promotion and relational aggression on Facebook, *Computers in Human Behavior* 36: 258–262, doi: 10.1016/j.chb.2014.03.076.

Ackerman, R.A., Witt, E.A., Donnellan, M.B., Trzesniewski, K.H., Robins, R.W., Kashy, D.A. 2011. What Does the Narcissistic Personality Inventory Really Measure? *Assessment 18* (1): 67–87, doi: 10.1177/1073191110382845.

Anderson, E.L., Steen, E., Stavropoulos, V. 2017. Internet use and problematic Internet use: A systematic review of longitudinal research trends in adolescence and emergent adulthood, *International Journal of Adolescence and Youth 22* (4): 430–454, doi: 10.1080/02673843.2016.1227716.

Andreassen, C.S., Pallesen, S., Griffiths, M.D. 2017. The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey, *Addictive Behavior 64*: 287–293, doi: 10.1016/j.addbeh.2016.03.006.

Asrese, K., Muche, H. 2020. Online activities as risk factors for Problematic internet use among students in Bahir Dar University, North West Ethiopia: A hierarchical regression model, *PLOS ONE 15* (9): e0238804, doi: 10.1371/journal.pone.0238804.

Arpaci, I. 2018. The moderating effect of gender in the relationship between narcissism and selfie-posting behavior, *Personality and Individual Differences 134*: 71–74, doi: 10.1016/j.paid.2018.06.006.

Austin, E.J., Farrelly, D., Black, C., Moore, H. 2007. Emotional intelligence, Machiavellianism and emotional manipulation: Does EI have a dark side? *Personality and Individual Differences 43* (1): 179–189, doi: 10.1016/j.paid.2006.11.019.

Brand, M., Wegmann, E., Stark, R., Müller, A., Wölfling, K., Robbins, T.W., Potenza, M.N. 2019. The Interaction of Person-Affect-Cognition-Execution (I-PACE) model for addictive behavior: Update, generalization to addictive behavior beyond internet-use disorders, and specification of the process character of addictive behavior, *Neuroscience & Biobehavioral Reviews 104*: 1–10, doi: 10.1016/j.neubiorev.2019.06.032.

Buckels, E.E., Trapnell, P.D., Paulhus, D.L. 2014. Trolls just want to have fun, *Personality and Individual Differences 67*: 97–102, doi: 10.1016/j.paid.2014.01.016.

Carrotte, E., Anderson, J. 2019. Risk Factor or Protective Feature? The Roles of Grandiose and Hypersensitive Narcissism in Explaining the Relationship between Self-Objectification and Body Image Concerns, *Sex Roles 80* (7–8): 458–468, doi: 10.1007/s11199-018-0948-y.

Casale, S., Fioravanti, G. 2018. Why narcissists are at risk for developing Facebook addiction: The need to be admired and the need to belong, *Addictive Behavior* 76: 312–318, doi: 10.1016/j.addbeh.2017.08.038.

Christie, R., Geis, F.L. 1970. *Studies in Machiavellianism*. London: Academic Press.

Chung, K.L., Morshidi, I., Yoong, L.C., Thian, K.N. 2019. The role of the dark tetrad and impulsivity in social media addiction: Findings from Malaysia, *Personality and Individual Differences* 143: 62–67, doi: 10.1016/j.paid.2019.02.016.

Corry, N., Merritt, R.D., Mrug, S., Pamp, B. 2008. The factor structure of the narcissistic personality inventory, *Journal of Personality Assessment 90* (6): 593–600, doi: 10.1080/00223890802388590.

Craker, N., March, E. 2016. The dark side of Facebook®: The Dark Tetrad, negative social potency, and trolling behavior, *Personality and Individual Differences* 102: 79–84, doi: 10.1016/j.paid.2016.06.043.

Dahl, D., Bergmark, K.H. 2020. Problematic internet use: A scoping review—longitudinal research on a contemporary social problem, 2006–2017, *Nordic Studies on Alcohol and Drugs* 9(2020): 1–29, doi: 10.1177/1455072520941997.

Dalbudak, Evren, C., Aldemir, S., Evren, B. 2014. The severity of Internet addiction risk and its relationship with the severity of borderline personality features, childhood traumas, dissociative experiences,

depression and anxiety symptoms among Turkish university students, *Psychiatry Research 219* (3): 577–582, doi: 10.1016/j.psychres.2014.02.032.

Douglas, H., Bore, M., Munro, D. 2012. Distinguishing the Dark Triad: Evidence from the five-factor model and the Hogan development survey, *Psychology 3* (3): 237–242, doi: 10.4236/psych.2012.33033.

Fox, J., Rooney, M.C. 2015. The Dark Triad and trait selfobjectification as predictors of men's use and self-presentation behavior on social networking sites, *Personality and Individual Differences* 76: 161–165, doi: 10.1016/j.paid.2014.12.017.

Gámez-Guadix, M., Borrajo, E., Almendros, C. 2016. Risky online behavior among adolescents: Longitudinal relations among problematic Internet use, cyberbullying perpetration, and meeting strangers online, *Journal of Behavioral Addictions 5* (1): 100–107, doi: 10.1556/2006.5.2016.013.

Guilford, J.P. 1965. *Fundamental Statistics in Psychology and Education*. New York: McGraw-Hill, pp. 134–148.

Jae, W.S., Seungwhan, L., Bryant, P. 2007. Materials on the Internet?: The Role of Individual Differences, *Cyberpsychology Behavior and Social Networking 10* (1): 71–79, doi: 10.1089/cpb.2006.9990.

James, S., Kavanagh, P.S., Jonason, P.K., Chonody, J.M., Scrutton, H.E. 2014. The Dark Triad, schadenfreude, and sensational interests: Dark personalities, dark emotions, and dark behavior, *Personality and Individual Differences* 68: 211–216, doi: 10.1016/j.paid.2014.04.020.

Jonason, P.K., Baughman, H.M., Carter, G., Parker, P. 2015. Dorian without his portrait: The psychological, social, and physical health costs of the Dark Triad traits, *Personality and Individual Differences* 78: 5–13, doi: 10.1016/j.paid.2015.01.008.

Kardefelt-Winther, D. 2014. A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use, *Computers in Human Behavior* 31: 351–354, doi: 10.1016/j.chb.2013.10.059.

Kasper, T.E., Short, M.B., Milam, A.C. 2015. Narcissism and Internet pornography use, *Journal of Sex & Marital Therapy 41* (5): 481–486, doi: 10.1080/0092623X.2014.931313.

Kayiş, A.R., Satici, S.A., Yilmaz, M.F., Şimşek, D., Ceyhan, E., Bakioğlu, F. 2016. Big five-personality trait and internet addiction: A meta-analytic review, *Computers in Human Behavior* 63: 35–40, doi: 10.1016/j.chb.2016.05.012

Kim, E.J., Namkoong, K., Ku, T., Kim, S.J. 2008. The relationship between online game addiction and aggression, self-control and narcissistic personality traits, *European Psychiatry 23* (3): 212–218, doi: 10.1016/j.eurpsy.2007.10.010.

Király, O., Griffiths, M.D., Urbán, R., Farkas, J., Kökönyei, G., Elekes, Z., Tamás, D., Demetrovics, Z. 2014. Problematic Internet use and problematic online gaming are not the same: Findings from a large nationally representative adolescent sample, *Cyberpsychology Behavior and Social Networking 17* (12): 749–754, doi: 10.1089/cyber.2014.0475.

Kircaburun, K., Demetrovics, Z., Király, O., Griffiths, M.D. 2018a. Childhood Emotional Trauma and Cyberbullying Perpetration Among Emerging Adults: A Multiple Mediation Model of the Role of Problematic Social Media Use and Psychopathology, *International Journal of Mental Health & Addiction* 18: 548–566, doi: 10.1007/s11469-018-9941-5.

Kircaburun, K., Demetrovics, Z., Tosuntaş, Ş.B. 2018b. Analyzing the links between problematic social media use, Dark Triad traits, and self-esteem, *International Journal of Mental Health & Addiction 17*: 1496–1507, doi: 10.1007/s11469-018-9900-1.

Kircaburun, K., Griffiths, M.D. 2018. The dark side of internet: Preliminary evidence for the associations of dark personality traits with specific online activities and problematic internet use, *Journal of Behavioral Addictions 7* (4): 993–1003, doi: 10.1556/2006.7.2018.109.

Kircaburun, K., Jonason, P.K., Griffiths, M.D. 2018c. The Dark Tetrad traits and problematic social media use: The mediating role of cyberbullying and cyberstalking, *Personality and Individual Differences* 135: 264–269, doi: 10.1016/j.paid.2018.07.034.

Kircaburun, K., Kokkinos, C.M., Demetrovics, Z., Király, O., Griffiths, M.D., Çolak, T.S. 2019. Problematic Online Behavior among Adolescents and Emerging Adults: Associations between Cyberbullying Perpetration, Problematic Social Media Use, and Psychosocial Factors, *International Journal of Mental Health & Addiction 17* (4): 891–908, doi: 10.1007/s11469-018-9894-8.

Kühberger, A., Schulte-Mecklenbeck, M., Perner, J. 2002. Framing decisions: hypothetical and real, *Organizational Behavior and Human Decision Processes 89* (2): 1162–1175, doi: 10.1016/S0749-5978(02)00021-3.

Kuss, D.J., Griffiths, M.D. 2011. Online social networking and addiction—A review of the psychological literature, *International Journal of Environmental Research and Public Health 8* (9): 3528–3552, doi: 10.3390/ijerph8093528.

Kuss, D.J., Griffiths, M.D., Karila, L., Billieux, J. 2014. Internet addiction: A systematic review of epidemiological research for the last decade, *Current Pharmaceutical Design 20* (25): 4026–4052, doi: 10.2174/1381612811319999061 7.

Ladanyi, J., Doyle-Portillo, S. 2017. The development and validation of the Grief Play Scale (GPS) in MMORPGs, *Personality and Individual Differences* 114: 125–133, doi: 10.1016/j.paid.2017.03.062.

Levenson, M.R., Kiehl, K.A., Fitzpatrick, C.M. 1995. Assessing psychopathic attributes in a noninstitutionalized population, *Journal of Personality and Social Psychology* 68: 151–158, doi: 10.1037/0022-3514.68.1.151.

Lin, S.S., Tsai, C.C. 2002. Sensation seeking and Internet dependence of Taiwanese high school adolescents, *Computers in Human Behavior 18* (4): 411–426, doi: 10.1016/S0747-5632(01)00056-5.

Lowe-Calverley, E., Grieve, R. 2017. Web of deceit: Relationships between the Dark Triad, perceived ability to deceive and cyberloafing, *Cyberpsychology: Journal of Psychosocial Research on Cyberspace 11* (2), doi: 10.5817/CP2017-2-5.

Lu, W.H., Lee, K.H., Ko, C.H., Hsiao, R.C., Hu, H.F., Yen, CF. 2017. Relationship between borderline personality symptoms and Internet addiction: The mediating effects of mental health problems, *Journal of Behavioral Addictions 6* (3): 434–441, doi: 10.1556/2006.6.2017.053.

Marcus, D.K., Zeigler-Hill, V. 2015. A big tent of dark personality traits, *Social and Personality Psychology Compass* 9: 434–446, doi: 10.1111/spc3.12185.

McCain, J.L., Campbell, W.K. 2018. Narcissism and social media use: A meta-analytic review, *Psychology of Popular Media Culture 7* (3): 308–327, doi: 10.1037/ppm0000137.

Moor, L., Anderson, J.R. 2019. A systematic literature review of the relationship between dark personality traits and antisocial online behavior, *Personality and Individual Differences* 144: 40–55, doi: 10.1016/j.paid.2019.02.027.

Neal, T.M.S., Sellbom, M. 2012. Examining the factor structure of the hare self-report psychopathy scale, *Journal of Personality Assessment* 94: 244–253, doi: 10.1080/00223891.2011.648294.

Ostovar, S., Allahyar, N., Aminpoor, H., Moafian, F., Nor, M.B.M., Griffiths, M.D. 2016. Internet addiction and its psychosocial risks (depression, anxiety, stress and loneliness) among Iranian adolescents and young adults: A structural equation model in a cross-sectional study, *International Journal of Mental Health and Addiction* 14: 257–267, doi: 10.1007/s11469-015-9628-0.

Pantic, I., Milanovic, A., Loboda, B., Błachnio, A., Przepiorka, A., Nesic, D., Mazic, S., Dugalic, S., Ristic, S. 2017. Association between physiological oscillations in self-esteem, narcissism and Internet addiction: A cross-sectional study, *Psychiatry Research* 258: 239–243, doi: 10.1016/j.psychres.2017.08.044.

Paulhus, D.L., Williams, K.M. 2002. The Dark Triad of personality: Narcissism, Machiavellianism, and psychopathy, *Journal of Research in Personality 36* (6): 556–563, doi: 10.1016/S0092-6566(02)00505-6.

Pettorruso, M., Valle, S., Cavic, E., Martinotti, G., di Giannantonio, M., Grant, J.E. 2020. Problematic Internet use (PIU), personality profiles and emotion dysregulation in a cohort of young adults: trajectories from risky behavior to addiction, *Psychiatry Research* 289: 113036, doi: 10.1016/j.psychres.2020.113036.

Raskin, R., Terry, H. 1988. A principal-components analysis of the Narcissistic Personality. Inventory and further evidence of its construct validity, *Journal of Personality and Social Psychology* 54: 890–902.

Rauthmann, J.F. 2011. Acquisitive or protective self-presentation of dark personalities? Associations among the Dark Triad and self-monitoring, *Personality and Individual Differences 51* (4): 502–508, doi: 10.1016/j.paid.2011.05.008.

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* (7): 884–889, doi: 10.1016/j.paid.2012.06.020.

Richardson, E.N., Boag, S. 2016. Offensive defenses: The mind beneath the mask of the Dark Triad traits, *Personality and Individual Differences* 92: 148–152, doi: 10.1016/j.paid.2015.12.039.

Rogoza, R., Cieciuch, J. 2018. Dark Triad traits and their structure: An empirical approach, *Current Psychology* 39: 1287–1302, doi: 10.1007/s12144-018-9834-6.

Rogoza, R., Cieciuch, J. 2019. Structural Investigation of the Short Dark Triad Questionnaire in Polish Population, *Current Psychology 38* (3): 756–763, doi: 10.1007/s12144-017-9653-1.

Sakakihara, A., Haga, C., Kinjo, A., Osaki, Y. 2019. Association between mothers' problematic Internet use and maternal recognition of child abuse, *Child Abuse & Neglect* 96: 104086, doi: 10.1016/j.chiabu.2019.104086.

Shim, J.W., Lee, S., Paul, B. 2007. Who responds to unsolicited sexually explicit materials on the internet? The role of individual differences, *Cyberpsychology Behavior and Social Networking 10* (1): 71–79, doi: 10.1089/cpb.2006.9990.

Sindermann, C., Sariyska, R., Lachmann, B., Brand, M., Erwin, L.H., Montag, C. 2018. Associations between the Dark Triad of personality and unspecified/specific forms of Internet-use disorder, *Journal of Behavioral Addictions 7* (4): 985–992, doi: 10.1556/2006.7.2018.114.

Smoker, M., March, E. 2017. Predicting perpetration of intimate partner cyberstalking: Gender and the Dark Tetrad, *Computers in Human Behavior* 72: 390–396, doi: 10.1016/j.chb.2017.03.012.

Spada, M.M. 2014. An overview of problematic Internet use, *Addictive Behavior 39* (1): 3–6, doi: 10.1016/j.addbeh.2013.09.007.

Tanchotsrinon, P., Maneesri, K., Campbell, W.K. 2007. Narcissism and romantic attraction: Evidence from a collectivistic culture, *Journal of Research in Personality 41* (3): 723–730, doi: 10.1016/j.jrp.2006.08.004.

Trumello, C., Babore, A., Candelori, C., Morelli, M., Bianchi, D. 2018. Relationship with parents, emotion regulation, and callous-unemotional traits in adolescents' Internet addiction, *BioMed Research International*, doi: 10.1155/2018/7914261.

van Geel, M., Goemans, A., Toprak, F., Vedder, P. 2017. Which personality traits are related to traditional bullying and cyberbullying? A study with the Big Five, Dark Triad and sadism, *Personality and Individual Differences* 106: 231–235, doi: 10.1016/j.paid.2016.10.063.

Visser, B.A., Pozzebon, J.A., Reina-Tamayo, A.M. 2014. Status-driven risk taking: Another "dark" personality? *Canadian Journal of Behavioral Science* 46: 485–496, doi: 10.1037/a0034163.

Vize, C.E., Lynam, D.R., Collison, K.L., Miller, J.D. 2018. Differences among Dark Triad components: A meta-analytic investigation, *Personality Disorders 9* (2): 101–111, doi: 10.1037/per0000222.

Wang, D. 2017. A study of the relationship between narcissism, extraversion, drive for entertainment, and narcissistic behavior on social networking sites, *Computers in Human Behavior* 66: 138–148, doi: 10.1016/j.chb.2016.09.036.

Xu, R., Frey, R.M., Fleisch, E., Ilic, A. 2016. Understanding the impact of personality traits on mobile app adoption—Insights from a large-scale field study, *Computers in Human Behavior* 62: 244–256, doi: 10.1016/j.chb.2016.04.011.

Young, K. 1998. *Caught in the Net: How to Recognize the Signs of Internet Addiction-and a Winning Strategy for Recovery*. New York: John Wiley & Sons.

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