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The Relationships Between Cyberbullying and the Dark Triad: A Meta-Analysis [1]*

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Abstract

Previous studies have, mainly, confirmed the role of dark personality traits in cyberbullying perpetration. However, when it comes to the relationship between individual Dark Triad traits (narcissism, Machiavellianism, and psychopathy) and cyberbullying, the results of studies are inconsistent. Therefore, the aim of this meta-analytic study was to determine the intensity of the relationship between cyberbullying and Dark Triad traits. The studies included in the meta-analysis are quantitative correlational studies in English, published in scientific journals. The analysis included 14 studies, which resulted in 18 independent effect sizes and a total sample of 12434 subjects from different populations (high school students, college students and the general population). The results of the meta-analytic study showed that cyberbullying has a positive correlation of low intensity with narcissism (r = .21, p < .001) and Machiavellianism (r = .28, p < .001), while the association with psychopathy is of moderate intensity (r = .31, p < .001). A moderating effect of population was not found in the association of cyberbullying with the dimensions of the Dark Triad. No moderating effect of region was found in the association of cyberbullying with the dimensions of narcissism and psychopathy, while there is a moderating effect of region on the correlation of cyberbullying and the dimension of Machiavellianism. Overall, the results of this study provide a confirmation to the empirical corpus which highlights the importance of all Dark Triad traits in cyberbullying perpetration, but given certain limitations, the estimated effect sizes in the population should be understood as preliminary.

Keywords: cyberbullying, Dark Triad, meta-analysis

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The Relationships Between Cyberbullying and the Dark Triad: A Meta-Analysis

Cyberbullying

In the era of global technological progress, violence can be done indirectly, through electronic devices or the Internet, and this type of violence is called cyberspace violence or cyberbullying (Olweus, 2012). It is defined as "an aggressive intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend himself" (Smith et al., 2008, p. 376). Tokunaga gives the following definition of cyberbullying: "Cyberbullying is any behavior performed through electronic or digital media by individuals or groups that repeatedly communicates hostile or aggressive messages intended to inflict harm or discomfort on others" (Tokunaga, 2010, p. 279). Hinduja & Patchin (2012, p. 88) define cyberbullying as "willful and repeated harm inflicted through the use of computers, cell phones, and other electronic devices". The main characteristic of cyberbullying is that it takes place electronically, through digital technologies. However, it is evident that there are certain disagreements when it comes to defining the phenomenon of cyberbullying more specifically (Slonje et al., 2013; Tokunaga, 2010), and the most important disagreements relate to the segments concerning repetition of the act and power imbalance (Slonje et al., 2013). Traditional violence implies repeating acts of violence, and in the case of cyberbullying, one act of violence committed online can trigger the reactions of many people and thus become violence (Slonje et al., 2013). The victim assumes that many people have seen the compromising material and perceives it as multiple injuries, thus as an act of violence. Sharing material online and thinking that the material has been seen by many users can be seen as repeating acts of violence in the digital space (Opsenica Kostić, 2022).

When it comes to the power imbalance between the bully and the victim, there is little evidence to suggest that cyberbullies have superior technological skills (Grigg, 2010). A factor that potentially contributes to the imbalance of power in cyberbullying is the anonymity of abusers and the use of pseudonyms on social networking platforms (Opsenica Kostić, 2022). Victims usually do not know who the cyberbully is, which makes it difficult to deal with the new situation (Slonje et al., 2013). If the victim knows who the cyberbully is, the power imbalance in the online space is only a reflection of the power imbalance that exists in the offline space (Opsenica Kostić, 2022). This imbalance of power stems from the disparity in physical strength or social status between the abuser and the victim. Additionally, the victim is afraid of confronting the cyberbully online because of possible further consequences offline (Slonje et al., 2013). A factor that definitely contributes to the imbalance of power in most cases of cyberbullying is the permanence of posted material, the fact that the victim cannot delete the content posted online, which contributes to the feeling of helplessness (Dooley et al., 2009; Opsenica Kostić, 2022).

Cyberbullying should be distinguished from similar concepts. Demarcation of the concept of cyberbullying from similar constructs is essential for the meta-analysis procedure, as it is an important criterion for the inclusion (or exclusion) of a particular study from the analysis. There is terminological confusion in the literature when it comes to the terms cyberbullying, cyber aggression, cyber harassment, cyberviolence and other similar terms. Some authors recommend using the term digital aggression instead of cyberbullying (Grigg, 2010). The terms cyberbullying and cyberviolence overlap a lot, and some authors believe that cyberbullying is more focused on individuals and is repeated, while cyberviolence targets a group of individuals with strong political preferences and does not happen often (Wang et al., 2022). Some authors make a terminological difference between one-off cases of violence, so they label such acts as digital harassment or digital attack (cyber harassment, cyber attack; Menesini & Nocentini, 2009). Additionally, cyberbullying should be distinguished from concepts such as trolling and flaming. Flaming is online verbal sparring, sending electronic messages with offensive, malicious, humiliating or vulgar content with the aim of discrediting people with different views (Dinić, 2022). Similar to flamers, trolls provoke other users to engage in emotional, lengthy online discussions (Buckels et al., 2013; Herring et al., 2002). Unlike flamers, trolls are not fundamentally interested in the topic, and their goal is to create confusion and discord in the existing online community and provoke as many reactions as possible from online participants (Dinić, 2022). Unlike digital bullying, cyber trolling does not create a power imbalance between the perpetrator and the target, it is mostly anonymous and can be one-off (Golf-Papez & Veer, 2017). Likewise, it has been shown that cyberbullying and cyber trolling have different correlations with personality traits from the *Big Five* model, with cyberbullying being correlated with higher *Neuroticism* and cyber trolling with greater *Openness to Experience* (Zezulka & Siegfried-Spellar, 2016). Therefore, apart from the fact that cyberbullying and cyber trolling differ in behavior, they can also be explained by different personality traits.

The Dark Triad

The concept of dark personality traits refers to a set of socially undesirable personality traits in a non-clinical population (Paulhus, 2014). The Dark Triad concept implies the combined effect of narcissism, Machiavellianism and psychopathy (Paulhus & Williams, 2002). Subclinical sadism was later added to this division (Buckels et al., 2013), and this extended concept was named the Dark Tetrad. In the subclinical sense, the main features of narcissism are inflated self-image, sense of superiority (Dinić et al., 2022), excessive self-love, grandiosity and need for admiration (Campbell & Foster, 2007). Subclinical psychopathy implies callousness, impulsivity and aggressiveness (Rauthmann, 2012), while Machiavellianism is characterized by manipulativeness and a negative perception of human nature (Jones & Paulhus, 2009). The common characteristics of these traits are callousness and

manipulativeness in interpersonal relationships (Dinić et al., 2020; Furnham et al., 2013). Although they share certain common characteristics, Dark Triad personality traits have characteristics that distinguish them. Psychopathy is characterized by a lack of feelings of guilt and remorse, as well as poor impulse control, while the primary characteristics of Machiavellianism are thoughtfulness, cynicism, and exploitation of others (Paulhus, 2014). An important difference between Machiavellianism and psychopathy is reflected in impulsivity, which is characteristic of psychopathy, while Machiavellianism is characterized by thoughtfulness and better control of behavior (Paulhus, 2014). The grandiose form of narcissism, which is most often examined within the concept of the Dark Triad, is primarily characterized by high self-esteem, a sense of superiority and a demand for special treatment (Paulhus, 2014).

Cyberbullying and the Dark Triad

Examining the relationship between the Dark Triad and cyberbullying, several studies have confirmed that all traits positively correlate with cyberbullying perpetration (Demircioğlu & Göncü-Köse, 2023; Goodboy & Martin, 2015; Panatik et al., 2022; Safaria et al., 2020; Wright et al., 2020), while in some studies the association of cyberbullying with narcissism and Machiavellianism was not confirmed (Pineda et al., 2022). Moreover, according to the results of some studies, psychopathy is the only significant predictor of cyberbullying (Goodboy & Martin, 2015), while in other studies Machiavellianism was the strongest predictor of cyberbullying, followed by psychopathy (Panatik et al., 2022; Safaria et al., 2020). In addition, the results of a study conducted by Wright et al. (2020) on adolescent samples from different countries (China, India, and Japan) suggest that the association between the Dark Triad and cyberbullying is not consistent and varies by country of origin. More precisely, in this study it was determined that narcissism and callous and unemotional traits were positively associated with cyberbullying perpetration for Chinese and Indian adolescents, but not for Japanese adolescents. In addition, the relationship between Machiavellianism traits and cyberbullying perpetration was found for Indian adolescents only. Such findings are explained by the differences in social organization, culture and value system between countries.

By reviewing the literature, we can notice that there are certain factors that are common to the Dark Triad and cyberbullying perpetration. The factors most commonly associated with cyberbullying and the Dark Triad are: (1) personality traits (Geng et al., 2021; Muris et al., 2017); (2) self-esteem (Pyżalski, 2012; Witt el al., 2011); (3) low levels of empathy (Jonason et al., 2013; Zych et al., 2019) and (4) emotion management (Akram & Stevenson, 2021; Kellerman et al., 2013).

The research results show that cyberbullying perpetration is associated with low empathy (Zych et al., 2019), lack of efficiency in emotion management (Segura et al., 2020), impulsive reactions as an emotional regulation strategy (Dinić et al., 2021) and low self-esteem (Dinić et al., 2021; Lei et al., 2020). When considering the relationship between self-esteem and Dark Triad traits, findings generally suggest that

explicit measures of self-esteem are positively related to narcissism and negatively related to Machiavellianism (Witt et al., 2011) and psychopathy (Falkenbach et al., 2013). Although all three traits are associated with a lack of empathy (Jonason et al., 2013), Machiavellianism and psychopathy are additionally positively associated with maladaptive emotion regulation strategies (Akram & Stevenson, 2021; Kyranides & Neofytou, 2021). Regarding narcissism, some studies indicated a positive relationship between this trait and maladaptive emotion regulation strategies (Altmann, 2017), while others found no significant relationship between these two variables (Zhang et al., 2015). Such findings support the thesis of certain authors that psychopathy and Machiavellianism are the core of a socially deviant character, while narcissism has a *brighter* nature (Rauthmann & Kolar, 2013). Nevertheless, we can note that the lack of empathy is a common factor of both the Dark Triad and cyberbullying (Jonason et al., 2013; Zych et al., 2019).

When it comes to personality traits, the results showed that the Honesty-Humility trait from the HEXACO model is inversely related to all Dark Triad traits (Muris et al., 2017) as well as to cyberbullying (Geng et al., 2021). This dimension defines human fairness, honesty, modesty and avoidance of greed (De Vries, 2013) and implies the absence of dark traits that can increase the risk of committing violence on the Internet (Hodson et al., 2018). People with low scores on the Honesty-Humility trait tend to manipulate others and break rules for personal gain, feel a strong sense of self-importance, and are more prone to deviant behavior. Thus, a low score on the Honesty-Humility dimension underlies both the Dark Triad and cyberbullying, and is a crucial factor in antisocial behavior (Allgaier et al., 2015; Thielmann & Hilbig, 2018).

Furthermore, review of the literature shows that certain demographic variables (e.g., gender, age) correlate differently with cyberbullying and Dark Triad traits. For example, some studies have revealed that the Dark Triad of personality traits are more characteristic of men than women (Muris et al., 2017). While a meta-analysis found that more men were involved in cyberbullying perpetration behavior than females, a moderation analysis showed that the gender difference varied depending on the sample region (Sun et al., 2016). In addition, according to research findings, the frequency of cyberbullying increases from youth to emerging adulthood and then decreases (Barlett & Chamberlin, 2017), most often occurs among the population of older high school students (Zhu et al., 2021), and the frequency is the lowest among the older population (Wang et al., 2019).

The mentioned differences in the research results are the motive for conducting a more detailed analysis of this relationship. The main goal of the paper is to try to answer the question about the intensity and significance of the relationship between dark personality traits and cyberbullying. Moreover, considering the results of previous studies, the moderator effect of region and population on the correlation of cyberbullying with traits of the Dark Triad was examined in the paper.

Based on the review presented above, the following hypotheses were formulated:

H1: Cyberbullying is positively associated with all traits of the Dark Triad (narcissism, Machiavellianism and psychopathy)

H2: There is a moderating effect of population on the correlation of cyberbullying and all traits of the Dark Triad

H3: There is a moderating effect of region on the correlation of cyberbullying and all traits of the Dark Triad

Method

Acceptable operationalizations of cyberbullying and the Dark Triad

Cyberbullying. In this meta-analysis, papers in which cyberbullying is defined according to the criteria given in the previously mentioned definitions (Hinduja & Patchin, 2012; Smith et al., 2008; Tokunaga, 2010) are acceptable. The meta-analysis did not include papers examining constructs similar to cyberbullying (cyberviolence, cybertrolling, cyber harassment). The following instruments will be taken as acceptable operationalizations of cyberbullying: *The European Cyberbullying Intervention Project Questionnaire – ECIPQ*, (Del Rey et al., 2015); *Cyberbullying & Online Aggression Survey Instrument – COAS,* (Hinduja & Patchin, 2015), as well as other instruments (related to a certain culture) if the review of the papers leads to the conclusion that they are based on the stated theoretical assumptions.

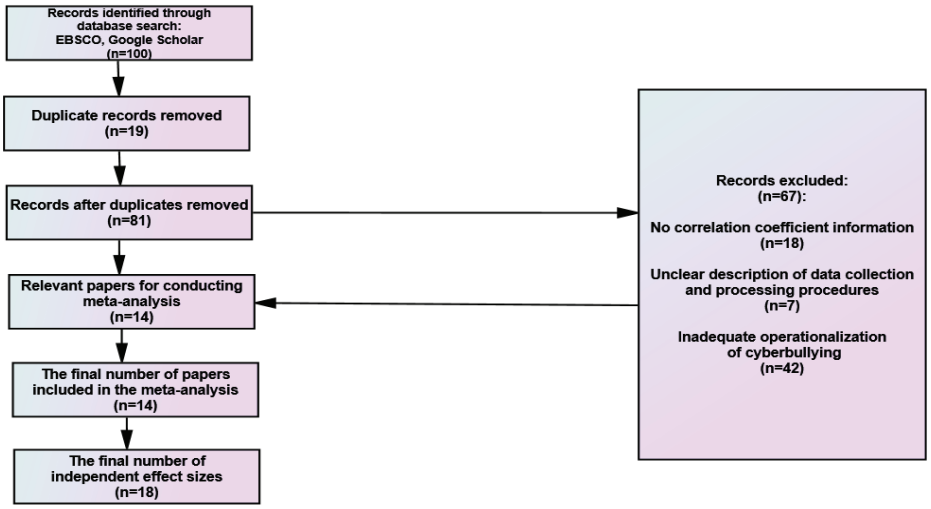
The Dark Triad. Although the paper theoretically discusses the Dark Triad, the Dark Tetrad concept is considered acceptable because it is a theoretical expansion of the primary concept (the Triad) obtained by adding subclinical sadism as a personality trait. Therefore, the meta-analysis will also include papers that consider the correlation between the Dark Tetrad and cyberbullying, with the author using only measures of narcissism, Machiavellianism, and psychopathy. When it comes to the Dark Triad, the following instruments will be taken as acceptable operationalizations: *The Short Dark Triad – SD3*, (Jones & Paulhus, 2014); *Dirty Dozen – DD*, (Jonason & Webster, 2010); *The Short Dark Tetrad Scale – SD4*, (Paulhus et al., 2021), as well as other instruments that measure the dark dimensions of personality individually, if the review of the papers determines that they are based on the stated theoretical assumptions.

Acceptable scientific sources

Only papers in English were included in the meta-analysis, and the database was searched in English. The search for papers was carried out on the Internet services available to the author, namely the *EBSCO* database and *Google Scholar*. As acceptable sources, peer-reviewed journals, doctoral dissertations, as well as papers from conferences and proceedings published in their entirety were considered. Based on PRISMA guidelines (Page et al., 2021), the flow of literature search, article

selection, screening, eligibility assessment and inclusion of papers in this research are shown in Figure 1.

Figure 1
Flow Diagram



Criteria for including papers in the study

The criteria for including studies in the meta-analysis procedure are as follows: 1) studies are published in English, 2) studies contain information on the correlation coefficient between cyberbullying and the dimensions of the Dark Triad - narcissism, Machiavellianism and psychopathy, 3) the variables are operationalized in the previously described manner that refers to the instruments and 4) the research was conducted in a methodologically correct manner, i.e., data collection and processing procedure were clearly described.

Statistical analyses plan

The IBM SPSS program (version 28) was used for statistical data processing. The meta-analysis procedure was performed according to the instructions exemplified by Sen and Yildirim (2022), which is a complete guide and practical manual for meta-analysis in the SPSS software package.

Effect sizes and heterogeneity analysis

The Pearson's correlation coefficient was used for the effect size. Because each of the Dark Triad traits represents a factor on its own, the results show the correlations

of cyberbullying with each trait separately. Therefore, in a strictly methodological sense, this meta-analysis consists of three meta-analyses. The measure that will be used as a weighting effect size measure is the sample size. First, Pearson's correlation coefficient values were transformed into Fisher's z-values. The SPSS program does not have an option to calculate Fisher's Z-transformed correlation and its variance, so an online calculator (https://www.campbellcollaboration.org/research-resources/effect-size-calculator.html) was used. The z-values and their variances were entered into the database, after which a weighted average effect size was calculated for each of the Dark Triad dimensions using the *Analyze-Continuous Outcomes-Pre-Calculated Effect Size* option. Then, using the *Analyze-Continuous Outcomes-Pre-Calculated Effect Size* option, the average weighted effect size and the statistical significance of the weighted effect size for each of the Dark Triad dimensions were obtained. After these statistical operations, the Z-values were again translated into Pearson's correlation coefficient (https://onlinestatbook.com/calculators/fisher_z.html). The random effects method assumes the heterogeneity of the populations from which the various study samples come from. According to the literature, in meta-analytic studies with non-experimental research, it is more appropriate to use variable effects models, because they fit better with real-life data (Diener et al., 2009, according to Đorđević, 2021). The method of Hunter and Schmidt (2004) was used to show measures of result dispersion of individual studies around the weighted average effect size. The total variance (VAR) consists of the error variance (VARse) and the true variance (VARr), that is, the true variance is the difference between the total variance and the error variance. The total variance (VAR) was calculated using the formula:

$$VAR = \frac{\Sigma(n*(r-\bar{r})^2)}{\Sigma n}$$

and the sampling error variance (VARse) using the formula:

$$VARse = \frac{((1-\bar{r}^2)^2)}{(Mn-1)}$$

After that, the true variance was obtained (VARr = VAR - VARse), i.e., a measure of the true variability of effect sizes between the populations included in the meta-analysis.

Heterogeneity was assessed by determining the indicator of heterogeneity significance (*Q* statistic), the percentage of total variability attributable to heterogeneity (I^2 statistic), and the total amount of variability ratio in the observed correlations to the amount of sampling variability (H^2 statistic). If the value of the *Q* statistic is greater than the number of own degrees of freedom (df = k - 1, where *k* is the number of studies included in the meta-analysis), the hypothesis of homogeneity between individual studies can be rejected. Rejection of the hypothesis of homogeneity justifies the use of random or variable effects models, calculation of I^2 and H^2 statistics, and analysis of hypothesized moderator variables (Huedo-Medina et al., 2006). The conventional classification suggests the following interpretation of

the value of the I^2 statistic: values around 25 represent low heterogeneity, around 50 represent moderate heterogeneity, and over 75 represent high heterogeneity (Huedo-Medina et al., 2006). The H^2 statistic represents the confidence interval of the percentage of total variability attributable to heterogeneity.

Moderation analysis

In the studies included in the analysis, the sample consisted of members of different populations from different countries. In order to eliminate doubts about the moderating effect of population and region, an analysis of the moderating effect of these variables was conducted. The populations that were represented in the analyzed papers were divided into three categories - high school students, college students and the general population, while the countries were classified into 4 groups – Europe (Spain, Austria, Poland, Netherlands), the USA, the Middle East (Turkey) and the Far East (China, Japan, Malaysia, Indonesia).

Results

Review of Papers

The electronic search was conducted between 01. 06. 2023. and 01. 07. 2023. by entering keywords in the search engines of electronic services for searching electronic scientific journals, *EBSCO* database and *Google Scholar*. In an attempt to find relevant studies, the following search commands were used: "cyberbullying" and "Dark Triad" and "correlation". After displaying the results, the first 100 found papers out of a total of 1250 papers that appeared in the search results were reviewed. After removing 19 duplicates, 81 records were identified and entered the second stage of screening. During the second phase, the author determined eligibility by reading the abstract of each article. The complete literature search procedure and review of abstracts was carried out by the author himself. When an article on the relationship between the Dark Triad and cyberbullying was confirmed as a relevant record, it was retained to be read in full at the next stage. However, after reviewing the papers, it was determined that a considerable number of studies do not examine cyberbullying, but constructs similar to cyberbullying, such as cyberviolence, cybertrolling, and cyber harassment. One dissertation on the topic of cyberbullying and the Dark Triad was found (Mashaba, 2020), but it was not included in the meta-analysis because it examines attitudes toward cyberbullying, not cyberbullying actions. A number of studies do not contain data on the correlation values between variables and are therefore excluded from the analysis. The study by Wright et al. (2020) is a study conducted on samples of adolescents from three different countries and shows the correlation coefficients of cyberbullying with the dimensions of the Dark Triad for each population separately. The situation is similar with the study conducted

by Brown et al. (2019), which contains data on the correlation coefficients and personality traits of the Dark Triad in three samples (Black, White and Asian). These studies were included in further analysis, so the total number of studies calculated as relevant for the analysis is 18. Studies examining constructs similar to cyberbullying (cyberviolence, cybertrolling, cyber harassment.) were not considered relevant for further analysis. Additionally, studies in which the measurement instruments used were not precisely described were not included in further analysis. Table 1 provides an overview of the studies included in the meta-analysis.

Table 1

Overview of Papers Included in the Meta-Analysis

						Pearson's correlation coefficient		
Authors	Source	Sample size	Sample (population, average age, country)	Cb-M	DT-M	N	M	P
Demircioğlu & Göncü-Köse, 2023	Current Psychology	547	high school students; 15,8; Turkey	ECIPQ	SD3	.20	.21	.41
Wright et al., 2020a	Asia Pacific Journal of Social Work and Development	683	adolescents; 12,5; China	CBPS	Narc; Mach; CU	.24	.33	.34
Wright et al., 2020b	Asia Pacific Journal of Social Work and Development	480	adolescents; 13; India	CBPS	Narc; Mach; CU	.33	.36	.37
Wright et al., 2020c	Asia Pacific Journal of Social Work and Development	474	adolescents; 12,5; Japan	CBPS	Narc; Mach; CU	.12	.21	.08
Brown et al., 2019a	Cyberpsychology, Behavior, and Social Networking	665	general population; White 22,48; USA	CBPS	SD3	.20	.26	.31
Brown et al., 2019b	Cyberpsychology, Behavior, and Social Networking	440	general population; Black Participants; 22,48; USA	CBPS	SD3	.29	.27	.40

Brown et al., 2019c	Cyberpsychology, Behavior, and Social Networking	777	general population; Asian Participant;22,48; USA	CBPS	SD3	.09	.30	.37
Panatik et al., 2022	EPESS	400	students; Malaysia	COASI	DD	.27	.42	.38
Hayes et al., 2020	Journal of Psychopathology and Behavioral Assessment	540	students; 19.27; USA	COASI	SD3	.11	.11	.31
Kircaburun et al., 2018	Personality and Individual Differences	761	students; 20.70; Turkey	COASI	DD	.47	.46	.30
Gajda et al., 2023	Current Psychology	251	general population; 28.54; Poland	FCBCV	SD4	.19	.27	.30
Schade et al., 2021	Frontiers in psychology	749	general population; 25; Austria	ECIPQ	NPI-15;MACH; SRP-III;	.17	.16	.30
Goodboy & Martin, 2015	Computers in human behavior	227	students; 20.97; USA	RAPRI	DD	.27	.30	.38
Safaria et al., 2020	International Journal of Scientific & Technology Research	2407	adolescents; 12-18; Indonesia	COASI	SD3	.13	.18	.13
van Geel et al., 2017	Personality and Individual Differences	1568	high school students ; 17.58; Netherlands	ECIPQ	SD3	.18	.17	.28
Zhang et al., 2022	Frontiers in psychology	501	adolescents; 14.01; China	CABS	DD	.22	.32	.31
Huang et al., 2023	Frontiers in Psychology	571	adolescents; 14,53; China	CBQ-Ch	DD	.17	.36	.32
Pineda et al., 2022	Frontiers in Psychology	393	adolescents; 14.18; Spain	CAI-CA	SD3	.05	.05	.13

Note. Cb-M = Cyberbullying measure; DT-M = Dark Triad measure; N = Narcissism; M = Machiavellianism; P = Psychopathy; ECIPQ (*The European Cyberbullying Intervention Project Questionnaire*; Del Rey et al., 2015); CBPS (*Cyberbullying perpetration scale;* Wright & Li, 2013); COASI (*Cyberbullying & Online Aggression Survey Instrument*; Hinduja & Patchin, 2015); FCBCV (*The Florence CyberBullying-CyberVictimization Scales*; Palladino et al., 2015); RAPRI (Griezel et al., 2012); CABS (*The Cyber Aggressive Behavior Scal*e;

Zhao & Gao, 2012); CBQ-ch (Lam & Li, 2013); CAI-CA (*Bullying Behavior Scale*, Magaz et al., 2016). SD3 (*The Short Dark Triad*; Jones & Paulhus, 2014); Narc (Thomaes et al., 2008); Mach (Christie & Geis, 1970); CU (*Callous-Unemotional Traits*; Frick, 2004); DD (The Dirty Dozen; Jonason & Webster, 2010); SD4 (*The Short Dark Tetrad Scale*; Paulhus et al., 2021); NPI-15 (*Narcissistic Personality Inventory-15*, Spangenberg et al., 2013); MACH (Rauthmann, 2013); SRP-III (*Self-Report Psychopathy;* Paulhus et al., 2016).

Weighted Effect Size

The metastatistics calculated in this analysis are presented in Table 2 according to the Dark Triad dimensions.

Table 2
The Relationship Between the Dimensions of the Dark Triad and Cyberbullying

Dark Triad	$\bar{r}$ [95% CI]	*k*	*N*	VAR	VARse	VARr	*Q* (df)	I^2	H^2
N	[0.16 – 0.26] 0.21*	18	12434	0.01	0.00	0.01	139.07* (17)	87.80	8.18
M	[0.22 – 0.33] 0.28*	18	12434	0.01	0.00	0.01	157.24* (17)	89.30	9.30
P	[0.27 – 0.36] 0.31*	18	12434	0.01	0.00	0.01	102.39* (14)	81.50	5.40

Note. N = Narcissism; M = Machiavellianism; P = Psychopathy; **p* < *.001;* $\bar{r}$ = weighted effect size (Pearson's correlation coefficient); *k* = number of studies, *N* = total sample size; VAR_R = total variance; VAR_{SE} = error variance; $VAR_{\bar{r}}$ = true variance; *Q* = indicator of the significance of heterogeneity; I^2 = percentage of total variability attributable to heterogeneity; H^2 = the ratio of the total amount of variability in the observed correlations to the amount of sampling variability

As specified in Table 2, all three dimensions of the Dark Triad - narcissism, Machiavellianism and psychopathy - are significantly positively correlated with cyberbullying, although, according to Cohen's criteria (Cohen, 1992), the correlation of cyberbullying with narcissism and Machiavellianism is low, while with psychopathy it is moderate. Based on the value of the *Q* statistic, the hypothesis of homogeneity between individual studies can be rejected, which justifies the use of random or variable effects models and the calculation of I^2 and H^2 statistics. The value of the I^2 statistic indicates high heterogeneity among studies.

By checking the relationship between the effect size and the standard error on the dimensions of the Dark Triad (Diagrams 1 to 3), intercept values were obtained on Egger's test: for narcissism (0.05; $p = .18$), for Machiavellianism (0.21; $p = .08$) and for psychopathy (0.19; $p = .03$). The distribution does not deviate significantly from the funnel shape, which demonstrates absence of bias in the published papers,

or that the bias is negligible (Diagrams 1 and 2). For the psychopathy dimension, the intercept value on the Egger's test is statistically significant (0.19; $p = .03$), indicating some bias in the published papers when it comes to this dimension (Diagram 3).

Diagram 1

Relationship Between the Standard Error of the Effect Size and the Effect Size – Narcissism

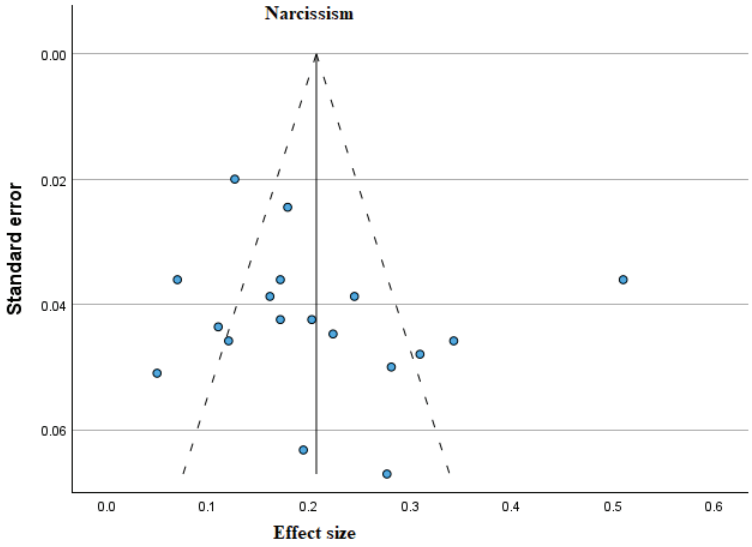


Diagram 2

The relationship Between the Standard Error of the Effect Size and the Effect Size – Machiavell

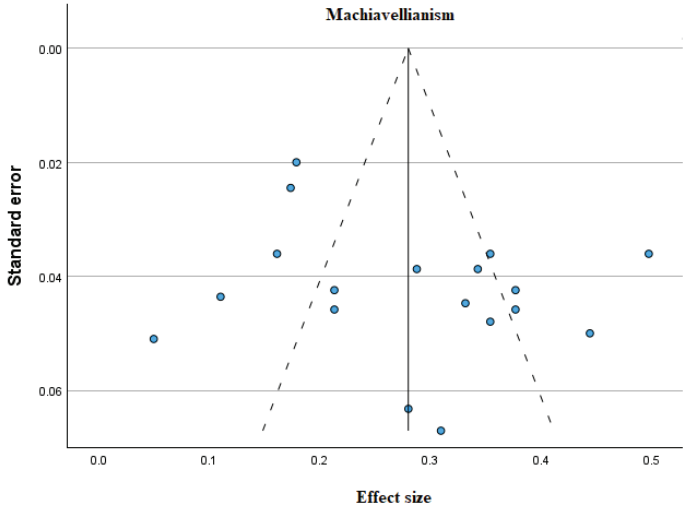
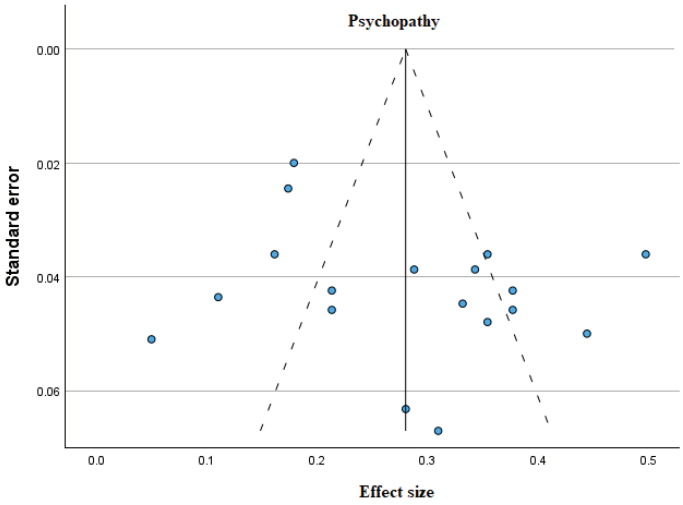


Diagram 3

The Relationship Between the Standard Error of the Effect Size and the Effect Size – Psychopathy



Moderation Analysis

Table 3 presents the effect sizes by population (high school students, college students and the general population). No moderating effect of population was found for the association between cyberbullying and the Dark Triad dimensions. The *Q* statistic values are: for narcissism ($Q = 0.73$; $df = 2$; $p = .69$), for Machiavellianism ($Q = 1.53$; $df = 2$; $p = .47$) and for psychopathy ($Q = 2.52$; $df = 2$; $p = .28$).

Table 3

Population-Based Weighted Average Effect Size Analysis

Population	Number of studies	*n*	$\bar{r}$		
			Narcissism	Machiavellianism	Psychopathy
High school students	9	7624	0.18	0.25	0.27
College students	3	1167	0.22	0.29	0.36
General population	6	3643	0.24	0.32	0.33

Note. $\bar{r}$ = weighted effect size (Pearson's correlation coefficient); n = total sample size.

Table 4 presents the effect sizes by region (Europe, USA, Middle East and Far East). No moderating effect of region was found in the association of cyberbullying with the dimensions of narcissism ($Q = 3.22$; $df = 3$; $p = .36$) and psychopathy ($Q = 4.90$; $df = 3$; $p = .18$), while there was a moderating effect of region on the correlation of cyberbullying with the dimension of Machiavellianism ($Q = 9{,}57$; $df = 3$; $p = .02$).

Table 4
Analysis of Weighted Average Effect Size by Region

Region			$\bar{r}$		
	Number of studies	*n*	Narcissism	Machiavellianism	Psychopathy
Europe	4	2961	0.15	0.16	0.26
USA	5	2649	0.18	0.28	0.35
Middle East	2	1308	0.36	0.36	0.37
Far East	7	5516	0.21	0.32	0.29

Note. $\bar{r}$ = weighted effect size (Pearson's correlation coefficient); n = total sample size.

Discussion

In the modern world of digital technologies and online communication via social networking sites, the phenomenon of cyberbullying is becoming more ubiquitous. This complex problem is approached from different sides - from the perspective of individual development, environmental factors, or, as was the case in this analysis, from the perspective of personality, particularly from the perspective of the Dark Triad model. Although previous studies have confirmed the association of dark personality traits with cyberbullying perpetration, there is inconsistency in the findings regarding the association of individual Triad traits with this construct. Therefore, the aim of this meta-analysis was to gain a clearer picture of the personality of people who are violent toward others in cyberspace. More precisely, the goal of the study was the quantitative integration of the results obtained in previous studies in order to determine the relationship between cyberbullying and the dimensions of the Dark Triad in the general population.

The obtained average weighted correlation size between all three traits of the Dark Triad and cyberbullying is statistically significant, and accordingly, our first specific hypothesis is confirmed. This hypothesis was formulated in accordance with the results of a number of previous studies that confirmed the role of all Triad traits in cyberbullying perpetration (Demircioğlu & Göncü-Köse, 2023; Goodboy & Martin, 2015; Panatik et al., 2022; Safaria et al., 2020; Wright et al., 2020). Moreover, the Dark Triad traits share certain common characteristics, namely callousness and manipulativeness in social relations (Dinić et al., 2020), so this finding is expected. In other words, we hypothesize that this common core makes all three dark traits relevant to cyberbullying. According to Cohen's criteria (Cohen, 1992), in the case of narcissism and Machiavellianism, we can speak of a low positive correlation with cyberbullying, while psychopathy, as a dimension of the Dark Triad, shows a moderate positive association with cyberbullying. Psychopathy is characterized by a lack of empathy, a lack of guilt, violation of social norms, high levels of impulsivity, a pronounced need for excitement, and low anxiety (Furnham et al., 2013), which makes psychopathy the darkest part of the Dark Triad. People with pronounced

psychopathy are emotionally superficial in social relations, skilled in shaping other people's opinions about them, charismatic, verbally fluent (O'Boyle et al., 2011), and tend to engage in cyberbullying because they are indifferent to the feelings of others and very impulsive (Demircioglu & Göncü-Köse, 2022; Goodboy & Martin, 2015). Psychopathy is associated with various types of socially undesirable behavior (O'Boyle et al., 2011) and preference for violent and other types of antisocial media content (Williams et al., 2001), and accordingly, the association of psychopathy with cyberbullying is expected.

Machiavellianism is a personality trait characterized by manipulating, exploiting, and deceiving others to further one's own interests (Furnham et al., 2013). People with high Machiavellianism believe that manipulation is the key to success, they have a cynical worldview, and distorted moral principles, such as the belief that the end justifies the means. *Machiavellians* often lie and deceive others, and are prone to betrayal (O'Boyle et al., 2011). We hypothesize that these characteristics make the Machiavellian dimension associated with violence in digital space. In some studies, the Machiavellian dimension has been most strongly correlated with cyberbullying (Huang et al., 2023; Panatik et al., 2022; Zhang et al., 2022). Although people with pronounced Machiavellian traits rarely engage in extreme forms of antisocial behavior (Jones & Paulhus, 2009), it is likely that the anonymity in cyberspace encourages them to engage in violent online behavior. People with pronounced Machiavellian and psychopathic traits are prone to traditional aggressive behavior and bullying with the aim of manipulation, thrill-seeking, or revenge (Zhu & Jin, 2021), so it is reasonable to assume that they will also exhibit such behavior in cyberspace.

Furthermore, according to the results of the meta-analysis, narcissism, as a dimension of the Dark Triad, is the weakest associated with cyberbullying, although this association is also statistically significant. In studies conducted in China, Machiavellianism and psychopathy are more strongly associated with cyberbullying than narcissism (Huang et al., 2023; Zhang et al., 2022), which is consistent with studies conducted in other cultures. However, in some studies, narcissism has been a significant predictor of cyberbullying (Brown et al., 2019; Wright et al., 2020). The main characteristics of narcissism are a sense of grandiosity, superiority, dominance, overestimation of self-worth, fantasies of success and having control over others (Paulhus & Williams, 2002). Narcissistic individuals overestimate their personal achievements, are extremely sensitive to criticism, and engage exclusively in social and romantic relationships with people who admire them and give them enough attention (O'Boyle et al., 2011). Narcissistic individuals appear arrogant, aggressive, and unlikable to others (Foster & Campbell, 2005). We hypothesize that the above characteristics link narcissism to violent behavior in cyberspace. The lowest intensity of the relationship between narcissism and cyberbullying supports the thesis of some authors that narcissism has a relatively *brighter* nature (Rauthmann & Kolar, 2013), because narcissistic personalities are charismatic and show higher emotional intelligence (Cairncross et al., 2013; Scavone, 2017).

The heterogeneity analysis showed that the hypothesis of homogeneity between individual studies can be rejected, i.e., that heterogeneity among studies, according

to the previously described conventional classification, is high. This result confirms the justification for using the variable effects model, as well as the moderator analysis. However, the results of the moderation analysis show that the population from which the sample was taken (adolescents, students, general population) has no moderating effect; accordingly, the second specific hypothesis is not confirmed. The third hypothesis was only partially confirmed because, according to the results, the moderating effect of the region was found only in the case of the correlation of cyberbullying with the Machiavellianism dimension. As already noted, in some studies the Machiavellianism dimension correlated most strongly with cyberbullying, and such values were obtained in studies conducted in the Middle and Far East, while this is not the case in European countries and the USA. However, based on the results obtained, it is not possible to conclude with precision why the average effect of studies conducted in the Middle and Far East is moderate, and the average effect of studies conducted in the USA and Europe is low according to Cohen's criteria (Cohen, 1992). It is necessary to verify this result in future research.

The limitations of this meta-analytic study stem from the defined criteria for inclusion/exclusion of individual studies. By defining the search to include papers in English, by setting stricter methodological criteria in terms of acceptable operationalizations (especially when it comes to cyberbullying), a sample of 14 articles was obtained. The author believes that defining strict criteria is important for methodological consistency and clarity, so that we do not sum up different constructs through summative analysis. The meta-analysis did not include results in unpublished papers. Given the aforementioned limitations, the estimated effect size in the population should be understood as preliminary. In future meta-analyses, it would be useful to redefine the criteria so that, in addition to published papers, unpublished studies and studies in other languages are included.

Conclusion

The results of this meta-analytic study showed that cyberbullying has a positive correlation of low intensity with narcissism and Machiavellianism, while the association with psychopathy is of moderate intensity. Such results are expected and provide confirmation to empirical corpus which highlights the significant role of dark personality traits in cyberbullying perpetration. In the context of implications for further psychological practice, the results of this study suggest the need for further research to examine in more detail protective and risk factors when it comes to cyberbullying, in order to explain the nature of the obtained correlations between cyberbullying and the Dark Triad traits. Moreover, finding moderators, i.e., factors that influence the direction and intensity of the relationship between the Dark Triad traits and cyberbullying, is a challenge for further research.

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Povezanost digitalnog nasilja[2] i Mračne trijade: metaanaliza

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Apstrakt

Prethodne studije su, uglavnom, potvrdile ulogu mračnih osobina ličnosti u vršenju digitalnog nasilja. Međutim, kada je u pitanju veza između pojedinačnih crta Mračne trijade (narcizma, makijavelizma i psihopatije) i digitalnog nasilja, rezultati studija nisu konzistentni. Stoga je cilj ove meta-analitičke studije bio da se utvrdi intenzitet veze između digitalnog nasilja i osobina Mračne trijade. Studije uključene u metaanalizu su kvantitativne korelacione studije na engleskom jeziku, objavljene u naučnim časopisima. Analiza je obuhvatila 14 studija, što je rezultiralo sa 18 nezavisnih veličina efekata i ukupnim uzorkom od 12434 ispitanika iz različitih populacija (srednjoškolci, studenti i opšta populacija). Rezultati meta-analitičke studije pokazali su da digitalno nasilje ima pozitivnu korelaciju niskog intenziteta sa narcizmom (r = .21, p < .001) i makijavelizmom (r = .28, p < .001), dok je povezanost sa psihopatijom umerenog intenziteta (r = .31, p < .001). Nije pronađen moderatorski efekat populacije u povezanosti digitalnog nasilja sa dimenzijama Mračne trijade. Nije pronađen moderatorski efekat regiona u povezanosti digitalnog nasilja sa dimenzijama narcizma i psihopatije, dok postoji moderatorski efekat regiona na korelaciju digitalnog nasilja i dimenzije makijavelizma. Generalno, rezultati ove studije pružaju potvrdu empirijskoj građi koja ističe značaj svih osobina Mračne trijade u vršenju digitalnog nasilja, ali s obzirom na određena ograničenja studije, procenjene veličine efekata u populaciji treba shvatiti kao preliminarne.

Ključne reči: digitalno nasilje, Mračna trijada, metaanaliza

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