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What Makes an Internet Troll? On the Relationships Between Temperament (BIS/BAS), Dark Triad, and Internet Trolling

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Abstract

Internet trolling is a provocative or offensive online behavior linked to engaging in anonymous activities that evoke negative feelings in other people. We analyzed the relationships between Internet trolling, Dark Triad traits (i.e., psychopathy, narcissism, and Machiavellianism), and the Behavioral Inhibition System (BIS)/Behavioral Approach System (BAS) in two studies. Study 1 involved a national quota sample representative of Polish young adults (N = 1,048, aged 18–25), and Study 2 involved a national quota sample of adult Poles (N = 432, aged 18–84). In both studies, we hypothesized and found that Internet trolling is predicted by low BIS and high BAS and that these relationships are mediated by high levels of psychopathy. These findings suggest that the basic temperamental dispositions may predispose individuals to irritate others on the Internet for one's own enjoyment due to high (vs. low) levels of psychopathy. We discuss the role of temperamental and personality traits in shaping offensive online behavior.

Keywords: Internet trolling; psychopathy; narcissism; Machiavellianism; high approach; low avoidance

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Introduction

Since its invention in 1989, the world wide web has been growing at an exorbitant pace and the number of Internet users reached 5 billion worldwide in 2022, amounting to 63% of the total world population (Kemp, 2022). The emergence of the virtual realm has influenced many areas of human life, including the way people interact with each other, how they acquire goods and knowledge, or how they work—the list could be very long. It has created innumerable opportunities, however, not all of them have had a positive impact on the individuals and the society in general. Different negative social phenomena, including cybercrimes, trolling, and many others, can also be observed at present, making the online world a hostile place for some people. The Internet grants greater anonymity, therefore providing an outlet for negative behaviors that are difficult to track to a specific individual. However, is higher impunity the only reason why individuals engage in this type of activities?

In the present research, we aim to explore the social psychological underpinnings of Internet trolling, a type of harmful online activity that may cause undesirable long-term consequences for Internet users by, for example,

creating a hostile online environment and polarising opinions (Coles & West, 2016). Vast line of research shows that Internet trolling behaviors are related to antagonistic personality traits, low self-esteem, and a heightened level of negative mood (Buckels et al., 2014; Cheng et al., 2017; March, 2019; March & Steele, 2020). However, the psychological mechanisms behind these associations are less well understood. Therefore, to discern the role of basic temperamental dispositions in fostering online hostility, we investigate the relationships between Internet trolling, antagonistic personality traits (narcissism, psychopathy, and Machiavellianism—frequently referred to as the Dark Triad traits; Paulhus & Williams, 2002), and behavioral inhibition versus approach systems. Our findings contribute to the existing literature in a meaningful way, as they demonstrate that certain temperamental dispositions are in fact associated with Internet trolling, therefore offering a more nuanced understanding of this online phenomenon. Moreover, our results may prove useful to those engaged in work aimed at limiting the scope of online hostility, such as Internet trolling.

Internet Trolling

Internet trolling is a relatively new phenomenon that has become more commonly known over the past decade (Fichman & Sanfilippo, 2016; Maltby et al., 2016). The word "trolling" derives from a troll—a mythological monster hiding under the bridges to lure and catch innocent passers-by in their snare (Fichman & Sanfilippo, 2016). A modern troll is a person in the online world that catches unaware Internet users in their trap. First, Internet trolls create chaos by, for example, posting contentious comments or sharing questionable pieces of information online. Their activity often refers to the so-called "hot spots"—topical and controversial social issues that evoke intense emotional reactions (Papapicco & Quatera, 2019). "Ordinary" Internet users fall into such traps and respond to these provocative activities, therefore creating space for Internet trolls to intensify their actions for their own amusement (Papapicco & Quatera, 2019). In other words, the primary goal of Internet trolls is to unleash a storm in online discussions. Thus, trolling is defined as "a repetitive, disruptive online deviant behavior by an individual toward other individuals or groups" (Fichman & Sanfilippo, 2016, p. 6). It is mainly focused on evoking unpleasant feelings (e.g., frustration or anger) in other discussion participants through inflammatory, destructive, and even aggressive posts or comments created by trolls just for their own fun and entertainment (Craker & March, 2016; Masui, 2019).

Although Internet trolling is a phenomenon that has been investigated for over a decade, to date there is no widely accepted single definition of trolling, but rather diverse definitions coexist highlighting different aspects of this phenomenon (for a review, see Hardaker, 2010). For example, according to Gemiharto and Sukaesih (2020), Internet trolls use fake online profiles to write provocative or off-topic messages to disturb discussions and cause emotional responses among other users. Hardaker (2010) defines trolls as Internet communication users who construct their online identity in such a way that they pretend to be part of the group, but their real intentions are to disrupt discussions, irritate or provoke others, or exacerbate a conflict for their own entertainment. Definitions of trolling cited above are somewhat convergent, however, they are not identical. Perhaps this is due to the fact that—as Fichman and Sanfilippo (2016) noticed—trolling behaviors are quite diverse and might have many meanings and contexts. Thus, a distinction needs to be drawn between trolling and other types of hostile online behaviors aimed at evoking negative feelings in other people, such as cyberbullying. Cyberbullying can be defined as a repeated and intentional act of aggressive communication initiated through an electronic device and directed at specific individuals, who are usually unable to defend themselves (Goodboy & Martin, 2015; Smith & Slonje, 2012). While both cyberbullying and trolling imply the aggressor's anonymity and abuse (Zezulka & Seigfried-Spellar, 2016), cyberbullying is aimed at specific targets. Thus, the effects of cyberbullying are more strongly related to the individual level, lowering the well-being of specific persons within the group (Smith et al., 2008; Zezulka & Seigfried-Spellar, 2016). In contrast, the effects of trolling may manifest on the group level, as it undermines group cohesion.

Despite the challenges in providing a definition of Internet trolling, our understanding of what this behavior consists of, as well as of its potential consequences, is constantly growing. However, the psychological underpinnings of Internet trolling still require further investigation. Thus, we aim to examine the so far unexplored area of the temperamental profile of Internet trolls and to connect it to the well-known personality predictors of trolling—the Dark Triad.

Temperamental Behavioral Inhibition and Approach Systems

Temperament is usually defined as basic and relatively constant dispositions, emerging in early childhood (Goldsmith et al., 1987; Strelau, 2004). It underlies and modulates human behavior in such areas as emotionality, activity, self-regulation, and attention (e.g., Rothbart, 2007; Rothbart et al., 2000; Shiner et al., 2012). It also serves as a basis for further development of personality (Rothbart et al., 2000). According to Gray's (1987) theory, classified as a psychobiological model of temperament with a neurobiological basis (Rothbart et al., 2000), temperamental traits appertain to the differences in reactivity of the two basic motivational systems responsible for regulating human behavior. These are the aversive system, called the Behavioral Inhibition System (BIS), and the appetitive system, named the Behavioral Approach System (BAS; Carver & White, 1994; Włodarska et al., 2021).

BIS is sensitive to signals of punishment and lack of reward (Carver & White, 1994; Gray, 1987), and responsible for inhibiting behaviors that may have painful or unpleasant consequences for individuals. Therefore, by inhibiting some actions associated with the risk of unpleasant consequences, a higher BIS level may cause individuals to fail in achieving their goals (Carver & White, 1994; Włodarska et al., 2021) but also to protect them from risky decisions and behaviors (Kim & Lee, 2011). In contrast, BAS is sensitive to signals of reward and lack of punishment. It regulates goal-oriented behavior: higher BAS is associated with a greater tendency to engage in activities aimed at achieving a particular objective (Carver & White, 1994; Gray, 1987; Strelau, 2014; Włodarska et al., 2021). Although BAS regulates targeted behavior and may lead to achieving one's goals, it is also related to risky behavior (Giles & Price, 2008; Kim & Lee, 2011)—as individuals with high BAS are more likely to be sensitive to rewards. As stated above, both BIS and BAS are considered temperamental systems with a neurobiological basis (Rothbart et al., 2000) and, thus, they are linked to specific, yet different, areas of the brain. BIS activity is "based on circuits including the orbital frontal cortex, medial septal area, and the hippocampus" (Rothbart & Bates, 2006, p. 108; see also Gray, 1991) and is related to neurotransmitters of norepinephrine and serotonin (Rothbart et al., 2000). On the other hand, the activity of BAS has been linked to the "medial forebrain bundle and lateral hypothalamus, and to influences of the neurotransmitters dopamine and norepinephrine" (Rothbart et al., 2000, pp. 127–128). Overall, past research has demonstrated that BIS and BAS are differently related to functioning on the neurobiological and behavioral level.

BIS/BAS and Internet Trolling

Previous research linked BIS and BAS to a broad range of undesirable psychosocial consequences, such as drug use, alcoholism, anxiety disorders, and depression symptoms (Franken & Muris, 2006; Johnson et al., 2003; Li et al., 2015). For example, past results showed that lower levels of BIS and higher levels of BAS predicted the use of alcohol and cigarettes (Giles & Price, 2008) and that higher BAS was a positive predictor of substance use (Franken & Muris, 2006). Moreover, BIS and BAS were found to have opposing effects on risk-taking preferences (Demaree et al., 2008) and on decisions taken after losing in a gambling task (Kim & Lee, 2011). Specifically, people with high BIS and low BAS were more likely to make a safer decision after having lost in gambling (Kim & Lee, 2011). Therefore, BIS may play a role as a buffer against risky behaviors, such as gambling, substance abuse, or jeopardizing one's health.

Taking into account past theorizing and research regarding antisocial Internet phenomena (e.g., Moor & Anderson, 2019), we understand Internet trolling as a somewhat risky behavior occurring online. As mentioned before, trolling can have adverse outcomes for both the victims of this behavior and for the trolls themselves (Binns, 2012; Coles & West, 2016). Due to the provocative, disruptive, and often aggressive character of this online behavior, trolls have to reckon with a severe backlash and criticism, including a permanent ban from a page or platform they are active on, or even a defamation lawsuit (Binns, 2012; Magaldi & Davis, 2018). Thus, in line with previous findings linking low BIS and high BAS with proneness to different types of risks and jeopardy, we hypothesized that Internet trolling should be related to lower levels of BIS (**H1**) and higher levels of BAS (**H2**). We assume that because of its' provocative, offensive character, acts of trolling may require low inhibition—and BIS is accountable for inhibiting behaviors that may result in unpleasant consequences (Carver & White, 1994), but they may also require high approach and activity to freely pursue trolls' goal, which is captured by BAS. Some further research provides indirect support for these hypotheses.

Importantly, BIS and BAS were found to be conversely related to antagonistic behavioral tendencies. For instance, anger-out, "a tendency to express one's anger outwardly" (Smits & Kuppens, 2005, p. 788), was found to be positively associated with BAS and negatively with BIS. The opposite result emerged for anger-in, "a tendency to turn one's anger-inwards" (Smits & Kuppens, 2005, p. 788), which was positively associated with BIS and negatively with BAS. Thus, high (vs. low) BIS may be predictive of a tendency to avoid situations which may lead to negative interpersonal outcomes (e.g., Runions et al., 2017; Smits & Kuppens, 2005). Of interest, similar patterns were observed for behaviors in the Internet space: BAS correlated positively and BIS negatively with cyber-aggression (namely, with its impulsive-appetitive type; Runions et al., 2017). Thus, we predict that the temperamental traits of BIS and BAS are also oppositely related to Internet trolling, as it is an activity aimed at evoking negative feelings in other people (Craker & March, 2016; Masui, 2019).

The Dark Triad Traits

Internet trolling is an act that often violates social norms (Fichman & Sanfilippo, 2016). Not surprisingly, it was found to be positively linked to the antagonistic personality traits of the Dark Triad (March et al., 2017; Moor & Anderson, 2019). All of these three traits share the core features of callousness (i.e., lack of empathy) and are all characterized by deliberate malevolence (Jones & Figueredo, 2013; Paulhus, 2014; R. Rogoza et al., 2022). Nevertheless, each of these traits represents some degree of specificity. For instance, psychopathy is characterized by impulsivity and recklessness (Hare, 1985), narcissism is underpinned by the sense of self-importance and entitlement, as well as by admiration-seeking (Krizan & Herlache, 2018), while Machiavellianism is hypothesized to be more goal-oriented and linked to cynical worldviews (Collison et al., 2018).

Paulhus and Williams' (2002) claimed that psychopathy might be "the darkest" of the Dark Triad traits. In this vein, a meta-analysis conducted by Muris and colleagues (2017) revealed that although all of the Dark Triad traits were positively associated with interpersonal difficulties, when controlling for the shared variance of the three traits, only psychopathy was significantly associated with aggression, socioemotional deficits, and erratic behaviors. Thus, it should not be surprising that psychopathy was found to predict a wide range of antisocial behaviors occurring online (Moor & Anderson, 2019), including Internet trolling, over and above Machiavellianism or narcissism (March, 2019; Moor & Anderson, 2019). For example, Craker and March (2016) found that Internet trolling on Facebook was positively associated with psychopathy, but was neither related to narcissism nor Machiavellianism.

Associations Between BIS/BAS Temperament and the Dark Triad

An issue that needs to be elucidated more is the relationship between temperament and personality traits, especially the Dark Triad. The former—often defined as "more narrow, lower-level traits" (Caspi & Shiner, 2006, p. 303; see also Strelau, 2001)—is related to the latter in the way that temperamental traits are understood as "the core of personality" (Rothbart et al., 2000, p. 122). In this vein, Gray's seminal theory has guided work on the biological underpinnings of personality traits (e.g., Carver et al., 2000; Carver & White, 1994; Depue, 1995; Smits & Boeck, 2006). For instance, it has been found that heightened levels of BAS might explain extraversion, while increased levels of BIS might underpin the trait of neuroticism (Smits & Boeck, 2006).

As temperamental traits are inherently linked to personality traits, thus, not surprisingly, they are also related to the Dark Triad traits. A meta-analysis of the published studies provided evidence that whereas narcissism and psychopathy were negatively related to BIS and positively to BAS, Machiavellianism was only positively related to the latter (Włodarska et al., 2021). Although psychopathy and narcissism share a similar temperamental profile, it seems that there is a difference in how they are expressed. For instance, whereas individuals scoring high on narcissism utilize their temperamental strength rather to win admiration, those scoring high on psychopathy may use the opportunity to cause havoc (M. Rogoza et al., 2022).

Overall, the relationships between Internet trolling and the Dark Triad traits (psychopathy in particular) are well documented. Here we aim to probe their temperamental underpinnings, thus contributing to the literature on the psychological mechanisms behind disruptive online behaviors. Specifically, as temperamental traits can be considered the roots of personality (Rothbart et al., 2000) and thus, might be reckoned as primal to personality,

we investigate whether the effects of BIS (**H3**) and BAS (**H4**) on trolling are mediated by psychopathy—the only consistent predictor of trolling among the Dark Triad traits.

Overview

The goal of the current paper is to analyze the relationship between Internet trolling and the Dark Triad traits, and to assess if, and how, temperamental traits of BIS and BAS might contribute to the understanding of this association. Although there is no research explicitly connecting Internet trolling to the temperamental traits, given the general tendency that individuals scoring high on BAS and low on BIS are attracted by situations that may lead to negative interpersonal outcomes, either in real-life or online (Harmon-Jones, 2003; Runions et al., 2017; Smits & Kuppens, 2005), we hypothesize that BIS should be related to Internet trolling negatively (**H1**), while BAS positively (**H2**). Considering that temperament serves as a basis for the development of personality (Rothbart et al., 2000) and, therefore, temperamental traits (i.e., BIS, BAS) are often considered primal to personality traits (i.e., Dark Triad), we investigate whether, and how, personality traits may mediate between temperamental traits and online behavior (i.e., Internet trolling). Additionally, given that psychopathy is the most consistent predictor of Internet trolling (e.g., Buckels et al., 2014; Craker & March, 2016; Moor & Anderson, 2019), we expect that it would mediate the relationship between BIS/BAS and Internet trolling. Thus, we predict that the effects of low BIS (**H3**) and high BAS (**H4**) on Internet trolling should be mediated by psychopathy.

These hypotheses were tested in two cross-sectional studies. Study 1 relied on a representative sample of Polish youth (aged 18–25). Young adults in Poland use the Internet more often than any other age group and spend the most time online each week (Centrum Badania Opinii Społecznej, 2019). By recruiting a sample of individuals frequently involved in online behavior, we aimed to increase the ecological validity of the study. In Study 2, we sought to increase the external validity and to replicate the results of Study 1 on a nationwide sample of adult Poles (aged 18–84), using the same measures. To test our hypotheses, we applied Pearson's correlations, regression, and mediation models using PROCESS macro 3.5 (Hayes, 2017; model 4), while also controlling for the effects of the demographics. Significance of the mediation analyses was tested with bootstrapped 95% confidence intervals for the standardized indirect effects, constructed with 5,000 resamples. Data and code necessary to replicate the results may be downloaded from the Open Science Framework repository: https://osf.io/836dk/?view_only=33ecbac02e0647e7a393ec9054940b17.

Study 1

Method

Participants and Procedure

Study 1 was conducted in December 2019 with a national quota sample representative of young Poles via Ariadna—a Polish online research panel, which has been used widely in academic studies before (e.g., Cislak et al., 2021; Golec de Zavala et al., 2020; Górska et al., 2020). Ariadna research panel has over 150,000 registered, verified, and active users, recruited mainly via mailing and Internet display advertisements. Data were collected through Computer Assisted Web Interviews (CAWI). The sample was non-probability, quota-based, and representative of the population of young Poles aged 18–25, with respect to gender, age, and settlement size. Quotas were selected based on the last National Census of Population and Housing, carried out by the Central Statistical Office (Główny Urząd Statystyczny*;* GUS). As a reward for participating in the study, participants received points that can be further exchanged for prizes. The final sample consisted of 1,048 participants, 52% women (coded as 1) and 48% men (coded as 0), aged between 18 and 25 (M = 22.35, SD = 2.15). We measured BIS/BAS as predictors, Dark Triad traits as mediators, and Internet trolling as a dependent variable. We also measured basic demographics.[1] The study was approved by the Research Ethics Committee of the Institute of Psychology, Polish Academy of Sciences (number of approval: 18/XI/2019).

Measures

Internet Trolling. We created the Internet Trolling Questionnaire (ITQ) in Polish for the purpose of this study.[2] For this, we adapted four items from the Global Assessment of Internet Trolling (GAIT; Buckels et al., 2014): *I like to troll people in forums or the comments section of websites*, *I have sent people to shock websites for the lulz*[3], *I enjoy griefing other players in multiplayer games*, and *The more beautiful and pure a thing is, the more satisfying it is to corrupt*, and, for exploratory and contextual reasons (i.e., creating the Polish version of the questionnaire), we included additional four items: *I love watching when my trolling posts and comments cause an avalanche of angry comments from other people*, *I enjoy trolling people on different social media*, *I participate in various Internet forums to troll people*, and *I like to piss people off on Facebook*. The new items were created to broaden and update the measurement of the spectrum of trolling behaviors, specifically to include items regarding social media, since they may be one of the main channels of Internet trolls' activity. Confirmatory Factor Analysis showed that all eight items—from GAIT (Buckels et al., 2014) and the new ones—formed one factor.[4] The reliability indexes for both the original short (α = .87, *M* = 2.19, *SD* = 0.99) and the full (α = .95, *M* = 2.09, *SD* = 1.01) scales were high. We report the results using the full scale. We also conducted the main analyses using only the GAIT (Buckels et al., 2014) items, and we observed a very similar pattern of results in both studies. Participants responded to items on scales from 1 = *strongly disagree* to 5 = *strongly agree*. The final score is the mean of all items, with a higher score indicating a higher level of readiness to engage in Internet trolling.

Temperamental Traits of the Behavioral Inhibition and Approach Systems. We used Carver and White's (1994) BIS/BAS Scales in a Polish adaptation by Müller and Wytykowska (2005). The BIS scale consists of seven items (e.g., *I worry about making mistakes*), including two reverse-coded ones, α = .76, *M* = 2.90, *SD* = 0.52, the BAS scale comprises 13 items (e.g., *I crave excitement and new sensations*), α = .85, *M* = 2.75, *SD* = 0.46, and four unrelated buffer statements (e.g., *A person's family is the most important thing in life*). Altogether, participants responded to 24 items on scales from 1 = *very false for me* to 4 = *very true for me*. The final scores are means of BIS and BAS items (separately), with a higher score indicating a higher level of a temperamental trait.

Dark Triad Traits. We used Jones and Paulhus's (2014) Short Dark Triad (SD3; Polish adaptation: R. Rogoza & Cieciuch, 2019) scale, which is comprised of three nine-item scales: Machiavellianism (e.g., *I like to use clever manipulation to get my way*), α = .81, *M* = 2.95, *SD* = 0.72, narcissism (e.g., *I have been compared to famous people*), including three reverse-coded items, α = .68, *M* = 2.72, *SD* = 0.61, and psychopathy (e.g., *People who mess with me always regret it*) including two reverse-coded items, α = .82, *M* = 2.31, *SD* = 0.74. Participants responded on a scale from 1 = *strongly disagree* to 5 = *strongly agree*. The final scores are means of the Dark Triad traits items (separately for each of the traits), with a higher score indicating a higher level of a trait.

Covariates. Participants were also asked to provide demographic details. In addition to age and gender, participants were asked to rate their education level (1 = *primary education*, 2 = *basic vocational education*, 3 = *secondary education*, 4 = *higher education*) and settlement size (1 = *rural area*, 2 = *city up to 20 thousands of residents*, 3 = *city between 20 and 99 thousands of residents*, 4 = *city between 100 and 200 thousands of residents*, 5 = *city between 200 and 500 thousands of residents*, 6 = *city with over 500 thousands of residents*).

Results

Zero-Order Correlations

We first computed correlation coefficients for the relationships between Internet trolling, temperamental, and the Dark Triad traits (Table 1). As predicted, Internet trolling was negatively related to BIS and positively, although weakly, associated with BAS, thus, providing support for both H1 and H2. Internet trolling was also associated with all of the Dark Triad traits—the strongest link was observed with psychopathy. In line with previous results, BAS was found to be positively related to all of the Dark Triad traits, while BIS was negatively related to narcissism and psychopathy. In contrast, Machiavellianism was positively, albeit weakly, related to BIS.

Table 1. *Zero-Order Correlations Between Internet Trolling, Dark Triad Traits, and BIS/BAS Scales (Study 1, National Quota Sample Representative of Young Poles).*

Variables	1	2	3	4	5
1. Internet trolling	—				
2. BIS	−.31***	—			
3. BAS	.11***	.21***	—		
4. Machiavellianism	.16***	.13***	.42***	—	
5. Narcissism	.31***	−.28***	.35***	.40***	—
6. Psychopathy	.55***	−.24***	.21***	.53***	.47***

Note. ***$p < .001$.

Regression Analysis

Second, we performed a stepwise hierarchical regression analysis to investigate the relationships of BIS, BAS, and Dark Triad traits with the outcome variable—Internet trolling, controlling for demographic variables as covariates (Table 2). In Step 1, we included gender, age, education level, and place of residence as covariates.[5] Model 1 was significant, $F(4, 1013) = 6.52$, $p < .001$. The results showed that gender and education were significantly related to trolling behavior: men and individuals with a lower level of education scored higher on Internet trolling. Thereby, we replicated the previous results on gender differences in trolling (Masui, 2019; Sest & March, 2017). In the second step, we entered BIS and BAS to investigate the effects of temperamental traits in terms of BIS/BAS theory. This model was also significant, $F(6, 1041) = 28.25$, $p < .001$. Internet trolling was related to lower levels of BIS and higher levels of BAS, thereby supporting H1 and H2, respectively. After introducing BIS and BAS into the regression model, the effect of gender on the dependent variable ceased to be significant. Finally, in the last model (Model 3), we introduced the Dark Triad traits, $F(9, 1038) = 64.11$, $p < .001$. We found that lower levels of Machiavellianism and higher levels of psychopathy both predicted Internet trolling, but narcissism was unrelated to the outcome variable ($p = .140$). After introducing the Dark Triad traits into the model, the effects of BIS and BAS remained significant, although weaker.

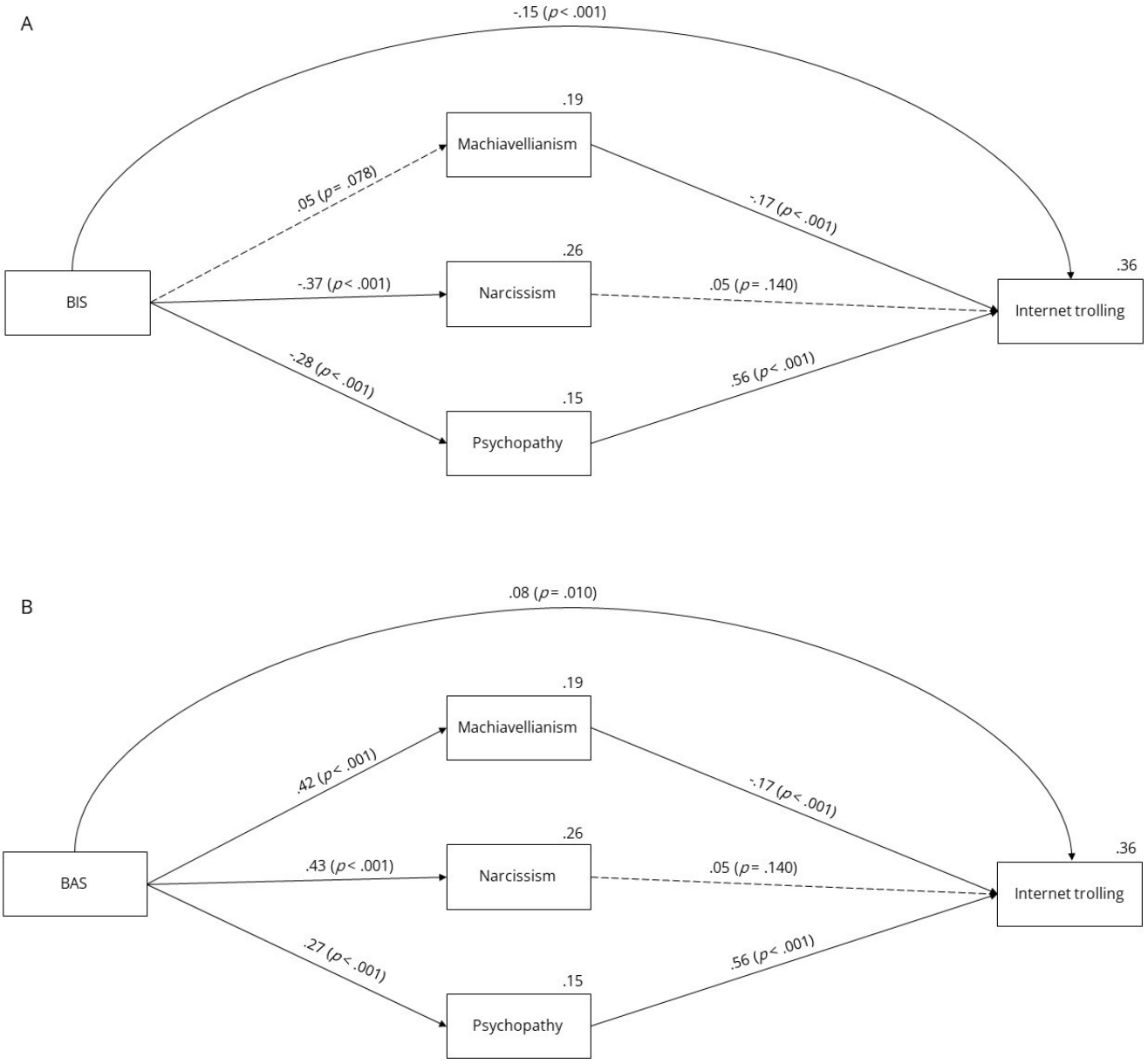
Table 2. *The Effects of BIS/BAS and Dark Triad Traits on Internet Trolling (Study 1, National Quota Sample Representative of Young Poles).*

	Model 1				Model 2				Model 3			
Variables	β	*B (SE)*	95% CI	*p*	β	*B (SE)*	95% CI	*p*	β	*B (SE)*	95% CI	*p*
Intercept		3.07 (0.33)	[2.43, 3.71]	<.001		3.68 (0.39)	[2.91, 4.45]	<.001		1.91 (0.36)	[1.20, 2.62]	<.001
Gender (0 = male; 1 = female)	−.07	−0.14 (0.06)	[−0.26, −0.02]	.026	−.04	−0.08 (0.06)	[−0.19, 0.04]	.193	−.01	−0.01 (0.05)	[−0.10, 0.10]	.933
Age	−.05	−0.02 (0.02)	[−0.06, 0.01]	.139	−.04	−0.02 (0.02)	[−0.05, 0.01]	.192	−.06	−0.03 (0.01)	[−0.06, −0.01]	.035
Settlement size	−.02	−0.01 (0.02)	[−0.05, 0.02]	.515	−.01	−0.01 (0.02)	[−0.04, 0.03]	.653	−.03	−0.02 (0.01)	[−0.04, 0.01]	.272
Education level	−.10	−0.11 (0.04)	[−0.19, −0.03]	.007	−.07	−0.08 (0.04)	[−0.16, −0.01]	.037	−.01	−0.01 (0.03)	[−0.07, 0.06]	.894
BIS					−.33	−0.65 (0.06)	[−0.76, −0.53]	<.001	−.15	−0.29 (0.06)	[−0.40, −0.18]	<.001
BAS					.17	0.38 (0.06)	[0.25, 0.50]	<.001	.08	0.17 (0.06)	[0.04, 0.29]	.010
Machiavellianism									−.17	−0.25 (0.05)	[−0.34, −0.15]	<.001
Narcissism									.05	0.08 (0.05)	[−0.03, 0.18]	.140
Psychopathy									.56	0.77 (0.04)	[0.68, 0.85]	<.001
Adjusted R^2		.02				.13				.35		
F		$F(4, 1043) = 6.52^{***}$				$F(6, 1041) = 28.25^{***}$				$F(9, 1038) = 64.11^{***}$		
ΔR^2						.11				.22		
Δ*F*						$F(2, 1041) = 69.96^{***}$				$F(3, 1038) = 116.97^{***}$		

Note. $^{***}p < .001$.

Indirect effects analysis showed several significant mediation effects between temperament and Internet trolling. The indirect effect of BIS on trolling via psychopathy, *IE* = −0.31, *SE* = 0.04, 95% CI [−0.388, −0.233], was significant, suggesting that the relationship between BIS and trolling was mediated by that trait (supporting H3). In turn, the indirect effects of BIS on trolling via Machiavellianism and narcissism were nonsignificant, *IE* = −0.02, *SE* = 0.01, 95% CI [−0.039, 0.002]; *IE* = −0.03, *SE* = 0.02, 95% CI [−0.077, 0.012], respectively. Similar results, albeit in the opposite direction, were found between BAS and Internet trolling. That is, the indirect effect of BAS on trolling via psychopathy was significant, *IE* = 0.32, *SE* = 0.05, 95% CI [0.236, 0.419], which indicated that BAS enhanced the use of Internet trolling through an increased level of psychopathy (supporting H4). The indirect effect of BAS on Internet trolling via Machiavellianism was also significant, *IE* = −0.16, *SE* = 0.03, 95% CI [−0.225, −0.091]. The indirect effect of BAS on Internet trolling via narcissism was not significant, *IE* = 0.04, *SE* = 0.03, 95% CI [−0.017, 0.102].

Figure 1. *Effects of BIS, BAS and Dark Triad Traits on Internet Trolling (Study 1, National Quota Sample Representative of Young Poles).*



Note. Entries are standardized coefficients. Solid lines indicate significant effects, dashed lines indicate nonsignificant effects. The effects of demographic variables are controlled. Panel A: effects of BIS and Dark Triad traits on Internet trolling with BAS as a covariate. Panel B: effects of BAS and Dark Triad traits on Internet trolling with BIS as a covariate.

Discussion

As expected, Study 1 showed opposite relationships between Internet trolling and behavioral approach (BAS) versus inhibition system (BIS). Internet trolling was predicted by both lower levels of BIS (H1) and higher levels of BAS (H2). Thus, Study 1 offers a novel perspective suggesting that basic temperamental dispositions predispose individuals to abuse others on the Internet for their own enjoyment. The results from Study 1 are in line with previous research findings emphasizing the role of high BAS and low BIS in engaging in approach behaviors, for instance, that BIS was negatively, and BAS positively associated with substance use (Stenason & Vernon, 2016), and that BIS and BAS systems may impact risk-taking preferences (Demaree et al., 2008). Moreover, the present findings contribute to the literature showing BIS/BAS associations with interpersonal difficulties (e.g., aspects of cyber-aggression; Runions et al., 2017).

The results also demonstrated that the effects of BIS and BAS on Internet trolling were to some degree accounted for by psychopathy, the trait that is associated with the readiness to inflict suffering on others and with engaging in other antisocial behaviors (Jones, 2014; Neumann & Hare, 2008; Paulhus, 2014). Basic temperamental predispositions are considered to be predictive of personality traits (Rothbart et al., 2000; Smits & Boeck, 2006; Włodarska et al., 2021), thus, we interpret this pattern as supporting our Hypotheses 3 and 4, that psychopathy mediates the effects of BIS and BAS on Internet trolling, respectively. Additionally, we found that the effect of BAS on Internet trolling was also accounted for by Machiavellianism. Machiavellians use others for their own purpose by manipulating them (Muris et al., 2017; Włodarska et al., 2021). This trait is also characterized by cynical and pragmatic beliefs, long-term strategic planning, and pursuit of self-beneficial goals (Rauthmann & Will, 2011; Włodarska et al., 2021). Thus, people high in Machiavellianism may be more strategic in their behavior and may not perceive Internet trolling, which involves disrupting discussions and irritating or provoking others simply for fun and entertainment (Hardaker, 2010), as serving their long-term goals. This might be a potential reason why higher Machiavellianism attenuated the positive effect of BAS on Internet trolling.

In Study 2, we aimed to replicate the effects observed in Study 1 and to increase the external validity of our findings. To this end, we collected data from a nationwide sample of Polish adults (as opposed to young adults only, which was the case in Study 1).

Study 2

Method

Participants and Procedure

Data for Study 2 was obtained in December 2020 via Pollster—a Polish online research panel, which has been previously used in academic studies (e.g., Kowalski et al., 2020). Pollster has over 230,000 registered users, recruited mainly through filling out Pollster's questionnaires displayed on Internet websites and via Internet advertisements. This study was conducted on a non-probability, national quota sample of Poles (N = 432), representative in terms of gender, age, settlement size, and education. Quotas were based on the Central Statistical Office (GUS) data. Participants were aged between 18 and 84 (M = 48.18, SD = 16.34), 42% were women (coded as 1) and 58% men (coded as 0). Data was collected via Computer Assisted Web Interviews (CAWI). Similarly to Study 1, as a reward for taking part in the study, participants received points that could be later monetized. As in Study 1, we measured BIS/BAS as predictors, Dark Triad traits as mediators, and Internet trolling as the dependent variable. We also measured basic demographics.[6] The study was approved by the Research Ethics Committee of the Institute of Psychology, Polish Academy of Sciences (number of approval: 26/X/2020).

Measures

Internet Trolling. Trolling behavior (α = .95, M = 1.49, SD = 0.82) was assessed as in Study 1.

Temperamental Traits of the Behavioral Inhibition and Approach Systems. BIS (α = .66, *M* = 2.79, *SD* = 0.42) and BAS (α = .81, *M* = 2.71, *SD* = 0.40) were assessed as in Study 1 (Carver & White, 1994; Müller & Wytykowska, 2005).

Dark Triad Traits. Machiavellianism (α = .69, *M* = 2.94, *SD* = 0.60), narcissism (α = .71, *M* = 2.69, *SD* = 0.60), and psychopathy (α = .81, *M* = 2.17, *SD* = 0.73) were assessed as in Study 1 (Jones & Paulhus, 2014; R. Rogoza & Cieciuch, 2019).

Covariates. We also asked participants to provide basic demographic details. In addition to age and gender, participants were asked to rate their education level and settlement size, as in Study 1.

Results

Zero-Order Correlations

Again, we first computed correlation coefficients for the relationships between Internet trolling, BIS/BAS, and the Dark Triad traits (see Table 3). Similarly to the results reported in Study 1, Internet trolling was positively related to BAS and to all of the Dark Triad traits. In contrast to the results of Study 1, however, we did not find a significant correlation between Internet trolling and BIS. Just as in Study 1, BAS was significantly and positively related to the Dark Triad traits. BIS was not significantly correlated to Machiavellianism, but there were significant negative relationships between BIS and both narcissism and psychopathy.

Table 3. *Zero-Order Correlations Between Internet Trolling, Dark Triad Traits, and BIS/BAS Scales (Study 2, National Quota Sample Representative of Poles).*

Variables	1	2	3	4	5
1. Internet trolling	—				
2. BIS	−.06	—			
3. BAS	.26***	.09	—		
4. Machiavellianism	.31***	.03	.40***	—	
5. Narcissism	.23***	−.27***	.41***	.38***	—
6. Psychopathy	.53***	−.14**	.39***	.61***	.46***

Note. ***$p < .001$, **$p < .01$.

Regression Analysis

In order to replicate the findings from Study 1, we performed a stepwise hierarchical regression analysis, following the same steps as in Study 1, to investigate the relationships of BIS, BAS, and the Dark Triad traits with the outcome variable—Internet trolling, controlling for demographic variables as covariates (Table 4). First, we regressed Internet trolling on demographic variables, $F(4, 427) = 11.61$, $p < .001$. Internet trolling was predicted negatively by age, meaning that the younger participants engaged in trolling more often than the older respondents. In Step 2, we included BIS and BAS—this model was also significant, $F(6, 425) = 13.67$, $p < .001$. Similar to Study 1, lower levels of BIS and higher levels of BAS were significant predictors of the dependent variable. In the final model (Model 3), we entered the Dark Triad traits, $F(9, 422) = 21.31$, $p < .001$. The trait of psychopathy was a significant positive predictor of Internet trolling. However, neither Machiavellianism, nor narcissism was a significant predictor of Internet trolling in this study. Moreover, after introducing the Dark Triad traits into the regression model, BIS and BAS's effects on the dependent variable ceased to be significant. The effect of age remained significant in the final model.

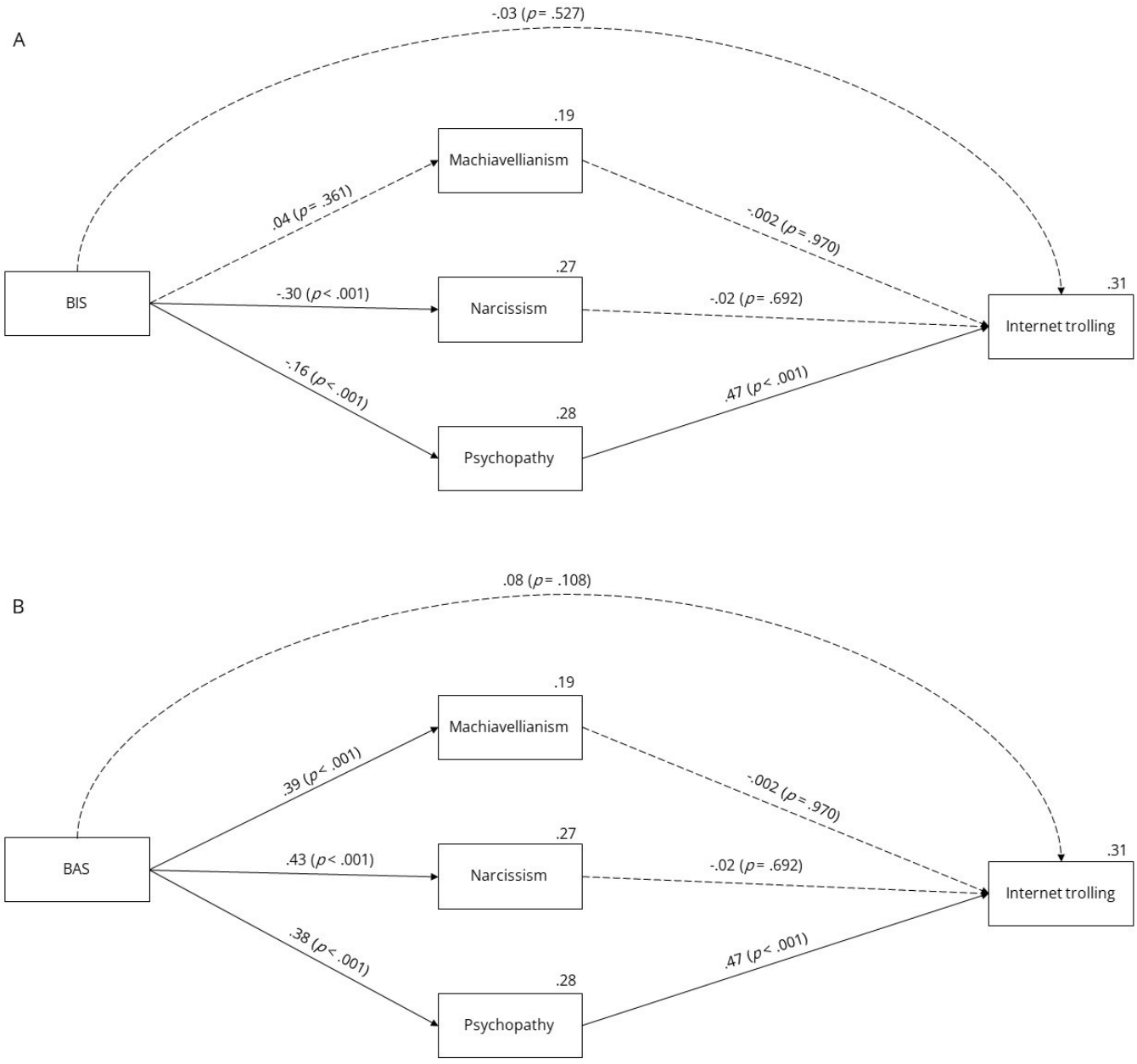
Table 4. *The Effects of BIS/BAS and Dark Triad Traits on Internet Trolling (Study 2, National Quota Sample Representative of Poles).*

	Model 1				Model 2				Model 3			
Variables	β	*B* (*SE*)	95% CI	*p*	β	*B*(*SE*)	95% CI	*p*	β	*B*(*SE*)	95% CI	*p*
Intercept		2.40 (0.17)	[2.07, 2.74]	<.001		1.55 (0.39)	[0.78, 2.31]	<.001		0.54 (0.38)	[−0.21, 1.29]	.156
Gender (0 = male; 1 = female)	−.06	−0.09 (0.08)	[−0.25, 0.06]	.220	−.04	−0.06 (0.08)	[−0.21, 0.09]	.440	.03	0.05 (0.07)	[−0.10, 0.19]	.525
Age	−.30	−0.02 (0.01)	[−0.02, −0.01]	<.001	−.28	−0.01 (0.002)	[−0.02, −0.01]	<.001	−.16	−0.01 (0.002)	[−0.01, −0.004]	<.001
Settlement size	.04	0.02 (0.02)	[−0.02, 0.06]	.404	.05	0.02 (0.02)	[−0.02, 0.06]	.295	.05	0.02 (0.02)	[−0.02, 0.06]	.248
Education level	−.07	−0.07 (0.04)	[−0.15, 0.02]	.126	−.09	−0.08 (0.04)	[−0.16, 0.002]	.055	−.03	−0.03 (0.04)	[−0.11, 0.05]	.487
BIS					−.10	−0.19 (0.09)	[−0.37, −0.01]	.035	−.03	−0.06 (0.09)	[−0.23, 0.12]	.527
BAS					.24	0.50 (0.09)	[0.32, 0.68]	<.001	.08	0.16 (0.10)	[−0.04, 0.35]	.108
Machiavellianism									−.002	−0.003 (0.07)	[−0.15, 0.14]	.970
Narcissism									−.02	−0.03 (0.07)	[−0.17, 0.11]	.692
Psychopathy									.47	0.53 (0.07)	[0.40, 0.66]	<.001
Adjusted R^2		.09				.15				.30		
F		$F(4, 427) = 11.61^{***}$				$F(6, 425) = 13.67^{***}$				$F(9, 422) = 21.31^{***}$		
ΔR^2						.06				.15		
ΔF						$F(2, 425) = 16.14^{***}$				$F(3, 422) = 30.82^{***}$		

Note. $^{***}p < .001$.

Similarly to Study 1, the indirect effect of BIS on trolling via psychopathy, *IE* = −0.15, *SE* = 0.05, 95% CI [−0.243, −0.069], was significant, indicating that the relationship between BIS and trolling was mediated by psychopathy. Therefore, we replicated the results of our previous study, suggesting that BIS was negatively associated with trolling by reducing the level of psychopathy. The indirect effects of BIS on trolling via Machiavellianism and narcissism were nonsignificant, *IE* = −0.01, *SE* = 0.01, 95% CI [−0.015, 0.015]; *IE* = 0.02, *SE* = 0.02, 95% CI [−0.032, 0.065], respectively. Next, the positive association between BAS and trolling was mediated by the psychopathy trait, indirect effects analysis also showed a significant effect of BAS on trolling via psychopathy, *IE* = 0.36, *SE* = 0.06, 95% CI [0.242, 0.497]. Thus, we replicated the result of Study 1, indicating that BAS enhanced the use of Internet trolling through an increased level of psychopathy. The indirect effects of BAS on Internet trolling via Machiavellianism and narcissism were nonsignificant, *IE* = −0.01, *SE* = 0.05, 95% CI [−0.087, 0.092]; *IE* = −0.02, *SE* = 0.04, 95% CI [−0.095, 0.049], respectively.

Figure 2. *The Effects of BIS, BAS and Dark Triad Traits on Internet Trolling (Study 2, National Quota Sample Representative of Poles).*



Note. Entries are standardized coefficients. Solid lines indicate significant effects, dashed lines indicate nonsignificant effects. The effects of demographic variables are controlled. Panel A: effects of BIS and Dark Triad traits on Internet trolling with BAS as a covariate. Panel B: effects of BAS and Dark Triad traits on Internet trolling with BIS as a covariate.

Discussion

Study 2, conducted with a national quota sample of Polish adults, partially replicated the results obtained in Study 1. The regression analysis again showed the expected opposite relationships between Internet trolling and Behavioral Approach (BAS) versus Inhibition Systems (BIS). In accordance with our expectations, lower levels of BIS (H1) and higher levels of BAS (H2) predicted Internet trolling. Thus, the results of Study 2 support our theorizing that temperamental traits are associated with Internet trolling. As in Study 1, psychopathy mediated BIS and BAS effects on the dependent variable. Specifically, lower BIS was associated with Internet trolling via higher psychopathy (H3). At the same time, higher BAS was associated with Internet trolling via higher psychopathy as well (H4). In line with past results, psychopathy emerged as the strongest predictor of Internet trolling among the Dark Triad traits (e.g., Craker & March, 2016; March et al., 2017; Moor & Anderson, 2019). However, in contrast to Study 1, we did not find a negative indirect effect of BAS via increased Machiavellianism. We elaborate further on this issue in the General Discussion section.

General Discussion

In the present research, we investigated the role of basic temperamental predispositions (i.e., BIS and BAS systems) and Dark Triad traits in shaping Internet trolling behavior. Across two studies, we hypothesized and found that low BIS (H1) and high BAS (H2) predicted Internet trolling and that these relationships were explained by "the darkest" of the Dark Triad traits—psychopathy (H3 and H4). In such a way, this research replicated and extended past work on personal characteristics underlying Internet trolling behavior in a different cultural context (i.e., Poland). Firstly, in line with past findings, we observed the link between Dark Triad traits and Internet trolling. Secondly and more importantly, this research is the first to reveal the temperamental roots of Internet trolling, which may stand behind the high impulsivity and low inhibition typical for psychopathy.

Theoretical Implications

As previously mentioned, both studies showed opposite relationships between Internet trolling and Behavioral Approach (BAS) versus Behavioral Inhibition Systems (BIS). BAS is associated with greater activity, striving for goals and impulsiveness (Carver & White, 1994; Gray, 1987; Strelau, 2001). It seems that Internet trolling requires activity, drive, and approach motivation to create confusion and stir emotions in other users, therefore fulfilling one of Internet trolls' many goals (Papapicco & Quatera, 2019). BAS is also associated with impulsivity, hence some Internet trolling behaviors might be an expression of this link. This result was in line with previous findings. March and colleagues (2017) showed that Internet trolling is associated with dysfunctional impulsivity, whereas another research (Leone & Russo, 2009) suggested that BAS also correlates with impulsivity.

Internet trolling was also found to be negatively related to the Behavioral Inhibition System. According to Gray's theory, BIS is responsible for inhibiting behaviors that may have unpleasant or painful effects (Carver & White, 1994; Włodarska et al., 2021). We propose that trolling is one of such behaviors. Due to creating chaos and exacerbating Internet conflicts (Hardaker, 2010), Internet trolls may trigger hostility (e.g., aggressive comments) in other Internet users. BIS may fulfill its basic protective function by inhibiting trolling and thereby minimizing the risk of unpleasant and painful experiences.

Our findings regarding the opposite effects of BIS and BAS on Internet trolling are in line with the vast literature on the temperamental roots of interpersonal behavior. For instance, Smits and Kuppens (2005) found that the anger-out coping style was positively associated with BAS and negatively with BIS, whereas anger-in showed an opposite pattern. Moreover, Runions and colleagues (2017) showed that some aspects of cyber-aggression correlated positively with BAS and negatively with BIS. In a similar vein, Internet trolling, as an online deviant behavior (Fichman & Sanfilippo, 2016), focused on evoking unpleasant feelings in other discussion participants (Craker & March, 2016; Masui, 2019), might be considered a type of interpersonal phenomenon characterized by high-approach, low-avoidance temperament (Włodarska et al., 2021).

Moreover, we replicated previous studies confirming that the Dark Triad traits, especially psychopathy, were associated with Internet trolling (Craker & March, 2016; March et al., 2017; Moor & Anderson, 2019). Among the Dark Triad traits, psychopathy is most strongly associated with antisocial strategies, socioemotional deficits, or problems with ethical behavior (Muris et al., 2017). Trolling as a type of antisocial behavior on the Internet, most

often aimed at causing frustration or anger in other discussion participants (Hardaker, 2010; Masui, 2019), is linked to impulsivity, sensation-seeking or destructiveness towards oneself or others, which are captured by psychopathy (Paulhus & Williams, 2002; Rauthmann & Kolar, 2012).

In line with past findings (Craker & March, 2016; Moor & Anderson, 2019), we did not find a similar pattern for narcissism. Narcissists crave positive reinforcement and admiration from the social environment, that is, other people (Back et al., 2013), whilst Internet trolling might lead to the opposite (i.e., being criticized). Narcissistic individuals strive to take advantage of various opportunities and social interactions in order to maintain and boost a grandiose self-image, as well as receive admiration from others (Morf & Rhodewalt, 2001). Internet trolling, however (at least measured in this general way), might not be the type of activity that meets their needs.

Across two studies, we did not observe a consistent pattern for Machiavellianism. In both studies, Machiavellianism was significantly related to BAS, but its relationship to BIS was significant only in Study 1. This replicated some of the past research on the relationship between the Dark Triad traits and BIS/BAS (Włodarska et al., 2021). Also, while in Study 1 (conducted among younger adults) Machiavellianism appeared as a weak negative predictor of Internet trolling, in Study 2 (conducted among adults of all ages) this relationship was not significant. This would suggest that the negative relationship between Machiavellianism and trolling may be the case only among young people, who spend more time online and, thus, are more familiar with the virtual world (Livingstone & Bober, 2004). It is possible that young individuals who score higher (vs. lower) on Machiavellianism may perceive Internet trolling as an unproductive activity, which prevents them from attaining their goals, because its effects are, perhaps, too unpredictable. This issue, however, requires further empirical investigation and should be treated with caution, as previous research did not find a significant effect of Machiavellianism on Internet trolling (Buckels et al., 2019; March et al., 2017; Seigfried-Spellar & Lankford, 2018; see also Moor & Anderson, 2019).

It is worth noting here that Internet trolling manifests itself in a variety of ways (Bishop, 2014) that may have different meanings (Fichman & Sanfilippo, 2016). The scale we used in this research was designed to capture the general readiness to engage in Internet trolling inspired by the GAIT scale (Buckels et al., 2014). Arguably, narcissism and Machiavellianism might be associated with Internet trolling in some contexts (e.g., when Internet trolling could bring recognition or could be strategic), but not in others. Similarly, certain types of Internet trolling (Bishop, 2014) could be more strongly related to narcissism and Machiavellianism than other. In contrast, the relationship between trolling and psychopathy might be less context-dependent. Regardless of its context or meaning, Internet trolling seems to be an opportunity to satisfy impulsive goals and an expression of disinhibition among individuals with high levels of psychopathy (March et al., 2017; Muris et al., 2017). Nevertheless, these conjectures need to be examined in future studies, possibly using more complex measures of Internet trolling.

Finally, the results of both studies demonstrated the indirect effects of BIS and BAS on Internet trolling through psychopathy. These findings imply that BIS is linked to lower levels of psychopathy, which in turn attenuates the use of Internet trolling. In contrast, BAS enhances the use of Internet trolling through increased levels of psychopathy. One of the possible mechanisms behind this effect may be a low level of anxiety and a high level of disinhibition linked to low BIS and high psychopathy (Muris et al., 2017; Paulhus & Williams, 2002; Strelau, 2014). High levels of BAS activity are associated with impulsivity (Gray, 1987; Strelau, 2014), which is one of the characteristics of psychopathy (Jones & Paulhus, 2011; Paulhus & Williams, 2002; R. Rogoza & Cieciuch, 2019). In line with this, BAS positively predicted Internet trolling and this relationship was mediated by psychopathy.

Practical Implications

Given that Internet trolling can be identified as undesirable online activity, leading to potentially negative outcomes, various attempts have been made to eliminate this form of hostile behavior, such as introducing troll detecting algorithms (Achimescu & Sultanescu, 2020), providing anti-troll training (Bhatt et al., 2018) or introducing specific legislation banning trolling (Klein, 2021). A practical implication of our studies is that both temperamental dispositions and personality traits should be taken into account in designing future Internet trolling interventions or trainings. For example, individuals high in disinhibition and impulsivity (i.e., low BIS, high BAS) could be offered easy access to more constructive activities or goals than Internet trolling, such as helping behavior (van den Bos et al., 2009). While tackling the basic temperamental predispositions or personality traits is challenging, offering online environments for instant rewards, stemming from more socially acceptable behavior and making it harder to gain instant rewards from abusing others (rather than punishing it), may be a more realistic and ethical way of counteracting disruptive online behavior. Thus, our results may provide valuable insight into the psychological

mechanisms underlying online hostility for professionals dealing with this phenomenon in everyday activities, for example educators or social media administrators. Finally, both policymakers designing anti-trolling legislation and activists leading anti-trolling campaigns could also benefit from this knowledge and potentially increase their activities' efficiency.

Limitations and Future Directions

Although our research adds to the knowledge on the psychological underpinnings of Internet trolling, it is not without limitations. Both studies were conducted with Polish participants, making our findings less generalizable. More studies involving samples drawn from different populations and cultures are needed to examine whether the effects of temperament (i.e., BIS and BAS) on Internet trolling are stable and replicable. Importantly, our studies, and most of the studies examining Internet trolling, were cross-sectional and involved correlational designs, thereby limiting causal inferences (for experimental studies regarding trolling see Cheng et al., 2017; Lopes & Yu, 2017).

Also, previous studies (e.g., Buckels et al., 2019; March, 2019; Sest & March, 2017) showed that the Dark Tetrad—and especially the trait of sadism that the Dark Tetrad includes—is a robust predictor of Internet trolling. In our research, we relied on the well-established measure of the Dark Triad, which has been validated in Polish (R. Rogoza & Cieciuch, 2019). However, future research would do well to additionally control for sadism when studying the associations between BIS and BAS, personality traits, and Internet trolling. This might be especially useful in the context of BAS, which is sensitive to reward signals (Carver & White, 1994; Gray, 1987; Włodarska et al., 2019). According to some scholars (Buckels et al., 2014), trolling can be seen as a sadistic act and online trolls might be "sensitive to the rewards afforded by interpersonal cruelty and humiliation of others" (Buckels et al., 2019, p. 21). In line with this, BAS could constitute an important factor in explaining the relationship between sadism and trolling, which should be investigated in future studies.

Moreover, future research would do well to examine Internet trolling and cyberbullying simultaneously. Although these are distinct online behaviors, they may share some similarities or congruent predictors (Zezulka & Seigfried-Spellar, 2016). For example, Goodboy and Martin's (2015) study showed that psychopathy is a unique predictor of cyberbullying among all of the Dark Triad traits, consistent with the results regarding trolling. However, they did not examine Internet trolling in their study, making it difficult to compare these two behaviors in terms of their personality profiles. In turn, Zezulka and Seigfried-Spellar (2016) conducted a study that measured both these online practices. Their research revealed that individuals engaged in these behaviors share some common traits (e.g., low conscientiousness). Still, there are differences between those involved only in cyberbullying and those involved only in trolling (e.g., high neuroticism vs. high openness to experience, respectively). We believe that more research examining both Internet trolling and cyberbullying, as well as other deviant online behaviors (e.g., flaming), would be greatly valuable in understanding the psychological differences and similarities between them. For example, future studies could investigate if Internet trolls and cyberbullies share similar temperamental profiles (i.e., low BIS, high BAS).

Closing Remarks

Overall, by investigating the associations between two basic motivational systems in humans (BIS/BAS) and trolling, the present research offers a novel approach to the study of the psychological underpinnings of hostile online behaviors. Crucially, our research replicated previous studies (Moor & Anderson, 2019) suggesting that psychopathy is the strongest and the most replicable predictor of Internet trolling among the Dark Triad traits, making this association more generalizable regardless of the cultural context and age group. Extending past findings, we found that not only personality traits, which have been studied before (i.e., Dark Triad), but also basic temperamental dispositions are associated with Internet trolling, drawing attention to the complexity of this phenomenon. Specifically, our results provide empirical evidence that Internet trolling may be in fact described as high-approach low-avoidance behavior (Włodarska et al., 2021). In other words, Internet trolls are characterized by disinhibition, a low level of fear of the unpleasant consequences of their actions, and high activity and impulsiveness. Thus, our findings may prove a valuable addition for those engaged in activities aimed at counteracting this type of disruptive online behavior.

Footnotes

[1] Besides the variables reported here, Study 1 also involved measures of political engagement and a set of individual differences variables included for the purposes of different projects employing the same predictors (please contact the first author for details).

[2] All items from the Internet Trolling Questionnaire (both in Polish and English) are available in the Online Supplement; https://osf.io/836dk/?view_only=33ecbac02e0647e7a393ec9054940b17.

[3] An informal expression meaning "for fun/laughs."

[4] All additional analyses are reported in detail in the Online Supplement.

[5] For the results of the analyses not accounting for demographic variables, see the Online Supplement; https://osf.io/836dk/?view_only=33ecbac02e0647e7a393ec9054940b17.

[6] Besides the variables reported here, Study 2 also involved measures of stress and emotions, and a set of individual differences variables included for the purposes of different projects employing the same predictors (please contact the first author for details).

Conflict of Interest

The authors do not have any conflicts of interest to report.

Authors' Contribution

Zuzanna Molenda: conceptualization, data curation, formal analysis, investigation, methodology, writing—original draft, writing—review & editing**. Marta Marchlewska**: funding acquisition, investigation, methodology, writing—review & editing, supervision**. Marta Rogoza**: investigation, validation, writing—review & editing**. Piotr Michalski**: formal analysis, investigation, writing—review & editing**. Paulina Górska**: formal analysis, investigation, writing—review & editing**. Dagmara Szczepańska**: investigation, writing—review & editing**. Aleksandra Cislak**: writing—review & editing.

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