



## Trolling, the Dark Tetrad, and the four-facet spectrum of narcissism

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### ABSTRACT

Trolling is an antisocial online behavior that involves the aggressive provocation of others by causing conflict for the “troll’s” own personal amusement. In the current study, we explore the utility of the facets of narcissism (agentic, communal, antagonistic, and neurotic) to predict perpetration of trolling, over and above the variance explained by gender, psychopathy, and sadism. We hypothesized that men would troll more than women, that psychopathy, sadism, and antagonistic narcissism would be positive predictors, and agentic, communal, and neurotic narcissism would be negative predictors. Participants ( $N = 444$ ; 66 % women, 34 % men;  $Mage = 34.95$ ,  $SD = 14.84$ ) were recruited via social media (i.e., Facebook) and Cloud Research to complete an anonymous, online questionnaire that comprised measures of personality and trolling behaviors. Results partially supported the hypothesis, with men, people with high psychopathy, and people with high sadism perpetrating more trolling. Unexpectedly, people with high communal narcissism and neurotic narcissism perpetrated more trolling. Antagonistic narcissism and agentic narcissism were nonsignificant predictors. These findings implicate the utility of exploring the facets of narcissism and provide important information regarding the psychological profile of trolls.

Internet trolling (i.e., “trolling”), an antisocial online behavior, involves the aggressive, intentional provocation of others for the “troll’s” own amusement (Navarro-Carrillo, Torres-Marín, & Carretero-Dios, 2021). Experiencing trolling is associated with an array of negative outcomes, such as self-harm and suicidal ideation (Coles & West, 2016). Trolling is also relatively prevalent; in a university sample, approximately 74 % had experienced an instance of trolling in the past week (Hong & Cheng, 2018). Concerningly, research also indicates a reciprocal relationship between experiencing and perpetrating trolling (March, 2019). Due to the impact and prevalence of trolling, further exploration of the mechanisms influencing perpetration of this online behavior is warranted (March, 2019).

As trolling is characterized by aggression (Hardaker, 2010), the  $I^3$  theory of aggression (Finkel & Hall, 2018) has been proposed as an appropriate framework to understand this perpetration (Liu, Wu, Li, Wang, & Geng, 2022). According to the  $I^3$  theory of aggression, aggressive behaviors emerge via three interrelated processes: Instigation (i.e., exposure to environmental stimuli that promote aggression), impellance (i.e., dispositional and stable factors, such as personality, that increase the likelihood of an aggressive response), and inhibition (i.e., dispositional and stable factors, such as personality, that reduce the likelihood an aggressive response). In the current study, we apply the  $I^3$

component of impellance by (1) replicating previous research exploring gender and the Dark Tetrad personality traits (i.e., Machiavellianism, psychopathy, sadism, and narcissism) as predictors of trolling, and (2) extending previous research by exploring, for the first time, the utility of the facets of narcissism (i.e., agentic, communal, antagonistic, and neurotic) to predict trolling.

### 1. Gender, the Dark Tetrad, and trolling

Compared to women, men are more likely to perpetrate trolling (Buckels, Trapnell, & Paulhus, 2014). Researchers have attributed this to gender stereotypes (March & Steele, 2020), where hypermasculine characteristics such as aggression and dominance are typically encouraged and subsequently more likely to be observed in men (Feinstein et al., 2013). Further to gender, researchers have explored the Dark Tetrad personality traits (Chabrol, Van Leeuwen, Rodgers, & Séjourné, 2009) as predictors of trolling perpetration. The Dark Tetrad traits comprise Machiavellianism, psychopathy, sadism, and narcissism — four interrelated, but distinct, traits that have been identified as impellers of aggressive behavior (Jain, Kowalski, Johnson, & Saklofske, 2022). Machiavellianism is characterized by strategic manipulation and exploitation of others (Jones & Paulhus, 2014), psychopathy by

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impulsivity, low empathy, and shallow affect (Jain et al., 2022), sadism by deriving pleasure from other people's suffering (Paulhus & Dutton, 2016), and narcissism by a grandiose self-importance, superiority, and entitlement (Chabrol et al., 2009). In multiple cross-sectional, correlational studies, adults with higher psychopathy and sadism have repeatedly been found to perpetrate more trolling (Buckels et al., 2014; March, 2019; Sest & March, 2017). This is attributed to the callous and impulsive characteristics of psychopathy and the sadistic enjoyment of harming others (March & Steele, 2020; Sest & March, 2017).

Positive correlations exist between Machiavellianism, narcissism, and trolling; however, neither trait emerges as a significant predictor when controlling for shared variance between the Dark Tetrad traits (Gylfason, Sveinsdóttir, Vésteinsdóttir, & Sigurvinsdóttir, 2021). For those with high Machiavellianism, the fast and sometimes impulsive nature of trolling may not appeal to their controlled and calculating nature (Craker & March, 2016). Further, researchers have speculated that those with high narcissism are perhaps too self-absorbed to be concerned with the effort of antagonising others via trolling (Craker & March, 2016). However, we suggest that another possibility is the measurement and conceptualisation of narcissism. In the literature exploring trolling, narcissism has typically been conceptualised as a total, homogenous construct (see Buckels et al., 2014; Craker & March, 2016). As narcissism is a faceted construct (Miller, Lynam, Hyatt, & Campbell, 2017), exploring only total narcissism may have obscured, and limited, its predictive utility. To date, research exploring the facets of narcissism and trolling is limited; however, one study differentiating grandiose narcissism and vulnerable narcissism found only vulnerable narcissism emerged as a significant, negative predictor of the online behavior (March, 2019). Based on these findings, the author recommended that future researchers exploring narcissism and trolling seek to conceptualize and assess narcissism as multidimensional.

## 2. The four-facet spectrum of narcissism

Several models of narcissism have been proposed in the literature. The two-dimensional Narcissistic Admiration and Rivalry model (Back et al., 2013) proposes that narcissists validate their grandiose sense of self through two distinct pathways (admiration and rivalry) which are characterized by separate behavioral processes. However, this model only focuses on the grandiose dimension of narcissism, subsequently omitting the vulnerable dimension. Alternatively, the three-facet structure of narcissism includes grandiose (agentic), vulnerable (neurotic), and antagonistic forms (Miller et al., 2016); however, this model is limited by its lack of inclusion of communal narcissism, a distinctive variant of the grandiose dimension (Gebauer, Sedikides, Verplanken, & Maio, 2012). To address these limitations, recent research has proposed the four-facet spectrum of narcissism — a comprehensive conceptualisation of narcissism that comprises four overarching facets (Mota et al., 2019).

The four-facet spectrum of narcissism comprises four qualitatively distinct facets: agentic, communal, antagonistic, and neurotic (Mota et al., 2019). Both agentic and communal narcissism are characterized by the desire to be well-regarded by others and positive self-promotion (Nowak, Brzóška, Piotrowski, & Żemojtel-Piotrowska, 2022). However, while those with high agentic narcissism self-promote through agentic means such as charm and extraversion (Luo, Cai, Sedikides, & Song, 2014), individuals with high communal narcissism self-promote through prosocial behavior (Luo et al., 2014). Antagonistic narcissism is characterized by self-defence, arrogance, and interpersonal exploitation (Mota et al., 2019). Lastly, those with high neurotic (i.e., vulnerable) narcissism are characterized by hypersensitivity, insecurity (Nowak et al., 2022), and a deep-rooted need for the approval of others (Mota et al., 2019).

There is rationale to expect that each of these facets will relate to trolling. As both agentic and communal narcissism are characterized by a desire to be well-liked and admired by others (Nowak et al., 2022), and

trolling is the deliberate provocation of others (March & Steele, 2020), those with high agentic and communal narcissism will likely be less inclined to troll. As antagonistic narcissism is characterized by arrogance and exploiting others (Mota et al., 2019), and intentionally antagonising and belittling others are fundamental trolling behaviors (March, 2019), those with high antagonistic narcissism will be more likely to troll. Lastly, as those with high neurotic narcissism are hypersensitive and insecure (Geary et al., 2021) Nowak et al., 2022), combined with previous findings that low vulnerable narcissism predicts more trolling (see March, 2019), it is expected that those with high neurotic narcissism will be less likely to troll.

The aim of the current study was to test the  $I^3$  theory of aggression element of impellance by exploring the utility of gender, psychopathy, sadism, and the four-facet spectrum of narcissism to predict perpetration of trolling. We hypothesised that men would troll more than women, and that psychopathy and sadism would be positive predictors. We predicted that the four facets of narcissism would explain additional variance, and that antagonistic narcissism would be a positive predictor, and agentic, communal, and neurotic narcissism would be negative predictors of trolling. Given recommendations to account for shared variance these traits (Furnham, Richards, & Paulhus, 2013), we included Machiavellianism in the model. Lastly, at the recommendation of previous researchers exploring trolling (March, 2019), we controlled for socially desirable responding.

## 3. Method

### 3.1. Participants and procedure

Participants were 444 individuals aged between the ages of 18 to 84 who formed the primary dataset used in this study ( $M = 34.95$ ,  $SD = 14.84$ ). Of the sample, 293 identified as women (66 %) and 151 identified as men (34 %). Participants were predominantly located in Australia (59 %) and the United States (22 %), primarily identified as heterosexual (71 %), and 32.2 % were current students. This research study was approved the [BLINDED FOR REVIEW] Human Research Ethics Committee (Approval No. XXXX). Participants were recruited to participate in the voluntary, anonymous online questionnaire via social media (Facebook, Instagram, Reddit;  $n = 290$ ) and via the paid recruitment platform Cloud Research ( $n = 154$ ). Upon accessing the survey, participants were presented with an overview of the study and were informed that by commencing the questionnaire they were providing their informed consent to participate. Participants recruited via social media were informed that they could enter a random draw to win one of three \$25AUD gift vouchers by participating. Those who were recruited via the paid platform were compensated with a small financial remuneration (~\$2USD). Completion of the questionnaire took approximately 30 min to complete and upon completion participants were debriefed and thanked for their time. An a priori power calculation with power set at 0.90, effect size at 0.15, alpha at 0.05, and with 9 predictors, indicated a minimum sample size of 141 participants required for sufficient power and this was satisfied.

### 3.2. Measures

A summary of all measures included in the online questionnaire can be seen in Table 1. Additional details regarding measurement of agentic and antagonistic narcissism can be found in the supplementary materials.

**Table 1**  
Summary of online questionnaire measures.

Construct	Measure	Author(s)	Items	Subscales	Example	Scale	$\alpha$
Trolling	Global Assessment of Internet Trolling-Revised	Sest & March, 2017	8	N/A	I enjoy upsetting people I do not personally know on the Internet	5-point Likert (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i> )	0.83
Machiavellianism psychopathy	Short Dark Triad Scale	Jones & Paulhus, 2014	18	Machiavellianism (9-items) Psychopathy (9-items)	Most people can be manipulated I like to get revenge on authorities	5-point Likert (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i> )	0.830 .81
Sadism	Short Sadistic Impulse Scale	O'Meara, Davies, & Hammond, 2011	10	N/A	I enjoy seeing people hurt	5-point Likert (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i> )	0.89
Agentic narcissism	Narcissistic Personality Inventory-13	Gentile et al., 2013	9	Leadership/authority (4-items) Grandiose exhibitionism (5-items)	I am a born leader I like to look at my body	Narcissistic response = 1 Non-narcissistic response = 0	0.73
Communal narcissism	Communal Narcissism Inventory	Gebauer et al., 2012	16	N/A	I am extraordinarily trustworthy	7-point Likert (1 = <i>Strongly disagree</i> ; 7 = <i>Strongly agree</i> )	0.92
Antagonistic narcissism	Narcissistic Admiration and Rivalry Questionnaire-Short Brief-Pathological Narcissism Inventory	Leckelt et al., 2018 Schoenleber, Roche, Wetzel, Pincus, & Roberts, 2015	3 8	Rivalry Exploitativeness (4-items) Entitlement Rage (4-items)	I want my rivals to fail I can usually talk my way out of anything I will never be satisfied until I get all that I deserve	6-point Likert (1 = <i>Strongly disagree</i> ; 6 = <i>Strongly agree</i> ) 6-point Likert (0 = <i>not at all like me</i> ; 5 = <i>very much like me</i> )	0.84
Neurotic Narcissism	Hypersensitive Narcissism Scale	Hendin and Cheek, 1997	10	N/A	I often interpret the remarks of others in a personal way	5-point Likert (1 = <i>Strongly disagree</i> ; 5 = <i>Strongly agree</i> )	0.82
Social Desirability	Marlowe-Crowne Short Form C	Reynolds, 1982	13	N/A	I am always courteous, even to people who are disagreeable	Socially desirable response = 1 Non-socially desirable response = 0	0.65

#### 4. Results

The study was a correlational, cross-sectional design and all analyses<sup>1</sup> on data<sup>2</sup> were performed on Jamovi (version 2.2). Total zero-order correlations and descriptive statistics are presented in Table 2. There were significant, negative correlations between social desirability, gender, and trolling, and significant positive correlations between all remaining variables and trolling. Men scored significantly higher than women on Machiavellianism, psychopathy, sadism, antagonistic narcissism, and trolling, with no other significant gender differences.

To control for shared variance between all variables, we performed a 3-step Hierarchical Regression Analysis with social desirability entered in step 1, gender, Machiavellianism, psychopathy, and sadism in step 2, and the facets of narcissism (agentic, communal, antagonistic, and neurotic) in step 3. The total model explained 53.30 % of variance in trolling,  $R^2 = 0.53$ ,  $F(9, 434) = 55.03$ ,  $p < .001$ , with a large effect size ( $f^2$ ) of 1.13. Details of the full model can be seen in Table 3. In the final model, gender (male), and high psychopathy, sadism, communal narcissism, and neurotic narcissism predicted trolling. Lastly, we explored the variance uniquely explained by each variable with a commonality analysis (Ray-Mukherjee et al., 2014; see Table 4).

#### 5. Discussion

The aim of the current study was to test the I3 theory of aggression element of impellance and explore the utility of gender, psychopathy, sadism, and the four-facet spectrum of narcissism to predict trolling. Compared to women, men were more likely to troll, thus supporting the hypothesis and corroborating previous findings (see Buckels et al., 2014;

Sest & March, 2017). This finding has been attributed to rigid gender stereotypes that encourage aggression and dominance (see March & Steele, 2020) thus leading men to engage in more antisocial behavior — both online and offline (Feinstein et al., 2013; Strimbu & O'Connell, 2021).

We also found that people with high psychopathy and high sadism trolled more, corroborating the hypothesis and previous findings (Buckels et al., 2014; March, 2019). As those with high psychopathy are often callous and impulsive (Jain et al., 2022), trolling may be a thrill-seeking activity that appeals to these individuals by presenting opportunities to aggressively prey on other online users (March and Steele, 2020). Further, as those with high sadism are said to derive pleasure from harming others (Paulhus & Dutton, 2016), social media likely provides these individuals with a platform to inflict pain onto others via trolling (Buckels, Trapnell, Andjelovic, & Paulhus, 2018). To account for shared variance (see Furnham et al., 2013), we included Machiavellianism in the model. Alike previous studies (see Gylfason et al., 2021; March et al., 2017), although Machiavellianism correlated with trolling it did not emerge as a predictor in the shared variance model.

We predicted that people with low agentic narcissism would engage in more trolling. However, agentic narcissism was a nonsignificant predictor. As agentic narcissism is characterized by a desire to be well-regarded and admired by others (Nowak et al., 2022), and those with high agentic narcissism employ charm to achieve this desire (Luo et al., 2014), it does follow that this facet may not predict trolling. Further, although antagonistic narcissism shared a strong, positive correlation with trolling, it was also nonsignificant in the shared variance model. This finding contradicted our hypothesis and previous suggestions that trolling is associated with antagonism and aggression (March et al., 2017; Navarro-Carrillo et al., 2021). As antagonism is considered a common core of the Dark Tetrad traits (Vize, Miller, & Lynam, 2019), we speculated that this finding could be due to the shared variance between antagonistic narcissism, psychopathy, and sadism. We controlled for psychopathy and sadism and found a significant, but weak, positive

<sup>1</sup> Summary of data screening and assumptions can be found in supplementary materials.

<sup>2</sup> [https://figshare.com/articles/dataset/Trolling\\_and\\_Narcissism/21965789](https://figshare.com/articles/dataset/Trolling_and_Narcissism/21965789).

**Table 2**

Bivariate correlations between gender, social desirability, Machiavellianism, psychopathy, sadism, the spectrum of narcissism, and trolling.

Variable	1	2	3	4	5	6	7	8	9	10
1. Gender	–									
2. Social desirability	–0.03	–								
3. Machiavellianism	–0.14**	–0.32**	–							
4. Psychopathy	–0.31**	–0.25**	0.60**	–						
5. Sadism	–0.22**	–0.26**	0.46**	0.65**	–					
6. Agentic narcissism	0.01	–0.24**	0.22**	0.37**	0.33**	–				
7. Communal narcissism	–0.08	0.19**	0.22**	0.26**	0.19**	0.16**	–			
8. Antagonistic narcissism	–0.16**	–0.39**	0.61**	0.62**	0.63**	0.45**	0.30**	–		
9. Neurotic narcissism	0.05	–0.42**	0.40**	0.25**	0.32**	0.12*	0.12*	0.50**	–	
10. Trolling	–0.27**	–0.15**	0.42**	0.64**	0.65**	0.31**	0.28**	0.53**	0.29**	–
Total <i>M</i> ( <i>SD</i> )	6.83 (2.74)	25.53 (6.59)	19.36 (6.47)	16.91 (7.61)	2.75 (1.94)	60.49 (17.77)	29.68 (10.20)	29.04 (7.33)	13.92 (5.70)	
Men <i>M</i> ( <i>SD</i> )	6.92 (2.61)	26.83 (6.17)	22.11 (6.18)	19.28 (8.30)	2.72 (1.95)	62.47 (18.48)	31.89 (10.30)	28.56 (7.18)	16.07 (6.05)	
Women <i>M</i> ( <i>SD</i> )	6.78 (2.81)	24.86 (6.72)	17.94 (6.17)	15.69 (6.94)	2.77 (1.94)	59.47 (17.33)	28.55 (9.98)	29.29 (7.41)	12.82 (5.19)	
<i>t</i> -Value	0.52	3.00**	6.75**	4.56**	–0.25	1.69	3.30**	–0.99	5.91**	
Cohen's <i>d</i>	0.05	0.30	0.68	0.48	–0.03	0.17	0.33	–0.10	0.59	

Note. Gender is coded as 0 = men, 1 = women.

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 3**

Hierarchical regression analysis of social desirability, gender, Machiavellianism, psychopathy, sadism, and the spectrum of narcissism predicting trolling.

	B [95 % CI]	SE B	$\beta$	<i>t</i>	$\Delta F$	<i>df</i>	$\Delta R^2$
<i>Step One</i>					10.20	1, 440	0.02
Social desirability	–0.31 [–0.51, –0.12]	0.10	–0.15	–3.19**			
<i>Step Two</i>					109.80	4, 438	0.49
Social desirability	0.10 [–0.04, 0.25]	0.07	0.05	1.38			
Gender	–0.79 [–1.63, –0.04]	0.43	–0.15	–1.87*			
Machiavellianism	0.02 [–0.05, 0.10]	0.04	0.01	0.63			
Psychopathy	0.32 [0.23, 0.40]	0.04	0.37	7.19**			
Sadism	0.30 [0.23, 0.37]	0.03	0.40	8.97**			
<i>Step Three</i>					4.88	4, 434	0.02
Social desirability	0.14 [–0.02, 0.31]	0.08	0.07	1.68			
Gender	–1.04 [–1.94, –0.20]	0.43	–0.21	–2.44**			
Machiavellianism	–0.02 [–0.09, 0.06]	0.04	–0.03	–0.43			
Psychopathy	0.29 [0.20, 0.38]	0.05	0.33	6.34**			
Sadism	0.27 [0.20, 0.34]	0.04	0.35	7.63**			
Agentic narcissism	0.17 [–0.05, 0.39]	0.11	0.08	1.51			
Communal narcissism	0.03 [0.00, 0.05]	0.01	0.08	2.24*			
Antagonistic narcissism	0.02 [–0.05, 0.08]	0.03	0.03	0.51			
Neurotic narcissism	0.08 [0.02, 0.14]	0.03	0.12	2.53*			

Note. B = unstandardised beta; SE = standard error,  $\beta$  = standardised beta; gender is coded as 0 = men, 1 = women.

\*  $p < .05$ .

\*\*  $p < .01$ .

**Table 4**

Commonality analysis with variance explained uniquely and commonly by social desirability, gender, Machiavellianism, psychopathy, sadism, and the spectrum of narcissism.

	Trolling
Unique for social desirability	0.57 %
Unique for gender	1.20 %
Unique for Machiavellianism	0.04 %
Unique for psychopathy	8.12 %
Unique for sadism	11.76 %
Unique for agentic narcissism	0.46 %
Unique for communal narcissism	1.01 %
Unique for antagonistic narcissism	0.05 %
Unique for neurotic narcissism	1.29 %
Common for all variables	0.05 %

correlation between antagonistic narcissism and trolling.<sup>3</sup> We suggest that the variance explained in trolling by antagonistic narcissism is largely captured by psychopathy and sadism.

Unexpectedly, and contrary to the hypothesis, people with high communal narcissism engaged in *more* trolling. It was surprising that a trait characterized by amplifying prosocial characteristics (e.g., agreeableness, being helpful; Luo et al., 2014) would be linked to an online behavior characterized by aggression (Navarro-Carrillo et al., 2021). To interpret this finding, we explored item-level correlations. We found the communal narcissism items with the strongest relation to trolling were “I will be well-known for solving the world’s problems” ( $r[444] = 0.42, p < .001$ ) and “I will be able to solve world poverty” ( $r[444] = 0.42, p < .001$ ), and the items with the weakest relation to trolling were “I am extraordinarily trustworthy” ( $r[444] = -0.00, p < .928$ ) and “I am an amazing listener” ( $r[444] = -0.03, p < .546$ ). As such, it appears that the communal narcissism characteristics least related to trolling are

<sup>3</sup>  $r(442) = 0.10, p = .041$ .

those that emphasise prosocial interpersonal characteristics, whereas the characteristics best related to trolling are those that capture an inflated sense of self and status.

Lastly, those with high neurotic narcissism engaged in more trolling, a finding inconsistent with our hypothesis and previous findings (March, 2019). This finding was unexpected, especially as our employed measure of neurotic (or vulnerable) narcissism (i.e., the Hypersensitive Narcissism Scale; Hendin & Cheek, 1997) was consistent with the methodology of March (2019). Still, it is worthwhile to note that the finding of March (2019) was yet to be replicated, and these findings suggest that trolling may be associated with insecurity and hypersensitivity to ego threats (e.g., neurotic narcissism; Grieve & March, 2021). Still, we acknowledge the need for further research to establish the role of vulnerable/neurotic narcissism on trolling to confirm such speculation.

## 6. Implications, limitations, future directions, and conclusion

We applied the I<sup>3</sup> theory of aggression (Finkel & Hall, 2018), exploring how dispositional and/or stable factors influence an individual engaging in aggressive behaviors (i.e., component of impellence). As many of the traits emerged as predictors of trolling, a theoretical implication is that the I<sup>3</sup> theory of aggression (Finkel & Hall, 2018) is a suitable framework to explain trolling perpetration. This theory may be applied to explore other antisocial online behaviors such as cyberbullying or cyberstalking.

Previous studies exploring trolling have typically conceptualised narcissism as a total, homogenous construct with no predictive utility (see Buckels et al., 2014; Craker & March, 2016). In the current study, we adopted recommendations that narcissism should be conceptualised, and measured, as multifaceted (Nowak et al., 2022). As differential patterns emerged between the facets and trolling, our findings implicate that future research exploring narcissism and online – and even offline – behaviors should adopt a facet-based approach. Still, given the relative novelty of the four-facet model of narcissism, we still recommend future researchers seek to establish the stability of this model.

Our assessment of agentic narcissism is a potential limitation. We followed the procedure of previous research (i.e., Nowak et al., 2022) which included the leadership/authority and grandiose/exhibitionism subscales of the NPI-13; however, other studies have typically measured agentic narcissism with the full NPI-13 or the extended NPI-16 (Ames, Rose, & Anderson, 2006). Although the internal reliability of the two subscales used in the present study was acceptable ( $\alpha = 0.73$ ), the inclusion of a less validated measure of agentic narcissism may have implications for construct validity. Future research might consider including a more validated measure of agentic narcissism.

The unequal distribution of gender within the current sample (women = 66 %) may also be a potential limitation. However, it is worthwhile to note that this ratio is more equal than previous studies (e.g., 75.9 % women; Craker & March, 2016; 85.6 % women; Gylfason et al., 2021). Still, we caution readers in concluding that women do not engage in antisocial online behavior. Indeed, some online behaviors (e.g., cancel culture) may be performed by more women than men (Cook et al., 2021), and future studies investigating those behaviors would likely result in somewhat balanced gender ratios.

Further, although common for researchers to use self-report measures to assess personality, the self-report nature of the questionnaire may be subject to response biases. Adopting recommendations of previous research (see March, 2019), we attempted to control for such bias by controlling for social desirability. Still, we recommend future research seek to explore personality and trolling by combining self-report data with behavioral observations to yield more objective findings.

In the current study, we applied the I<sup>3</sup> theory of aggression and explored, for the first time, the four-facet spectrum of narcissism in relation to trolling perpetration. Given the novel, exploratory nature of

this study, we note the need for replication to ensure the reliability of these findings. Our findings indicate that trolls are likely to be male, and impulsive and callous (i.e., psychopathy), and enjoy harming others (i.e., sadism). Further, based on our exploratory findings, trolls may have an inflated sense of self and status (i.e., communal narcissism) that is characterised by insecurity and hypersensitivity to ego threats (i.e., neurotic narcissism). The psychological profile of the internet troll identified in the current study might inform psychoeducational programs with the goals of both managing and preventing trolling and informing – and thus empowering – those who experience it.

## CRedit authorship contribution statement

**Lauren Furian:** Conceptualization, Methodology, Formal analysis, Writing – original draft. **Evita March:** Conceptualization, Writing – review & editing, Supervision.

## Data availability

The link to open data is included in the results section

## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2023.112169>.

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