



The dark side of Facebook®: The Dark Tetrad, negative social potency, and trolling behaviours



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ABSTRACT

Trolling behaviours on social networking sites (SNSs) are problematic for other computer mediated communication users, as the psychological effects of experiencing trolling online are considered similar to the psychological effects of offline harassment. The current study explored personality traits and social motivations associated with individuals who engage in online trolling, specifically on the SNS Facebook®. The Dark Tetrad personality traits (i.e., narcissism, Machiavellianism, psychopathy, and sadism) and social reward (specifically, negative social potency) were examined for their predictive utility of trolling behaviours on Facebook®. A sample of 396 adults (75.9% women, 24.1% men) aged between 18 and 77 years of age ($M = 34.41$, $SD = 1.70$) completed the Global Assessment of Facebook® Trolling (GAFT), The Dirty Dozen, The Short Sadistic Impulse Scale, and The Social Rewards Questionnaire. Results showed that trait psychopathy and sadism predict Facebook® trolling behaviours; however, negative social potency had the strongest predictive utility. These results show that individual trolling behaviour may be better explained by negative social reward motivation than negative personality traits. In addition, these findings offer practical implications for SNS administrators and everyday users of SNSs. Future research should continue to explore predictors of this understudied antisocial online behaviour.

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1. Introduction

Trolling is an interpersonal antisocial behaviour prominent within Internet culture across the world. A form of online bullying and harassment (Pew Research Centre, 2014), common trolling behaviour includes starting aggressive arguments (Klempka & Stimson, 2013) and posting inflammatory malicious messages in online comment sections to deliberately provoke, disrupt, and upset others (Gammon, 2014). The attraction to be a 'troll' and engage in this type of online misconduct is enormous, with current statistics suggesting that over a quarter of Americans have engaged in trolling behaviour at one time or another (Gammon, 2014). Although still in its infancy, areas of academic research have begun to explore predictors of online misconduct including as cyber-bullying, identity theft, and cyberstalking. However, research focusing specifically on trolling has been very limited. The current study aimed to predict trolling behaviours on Facebook® from the Dark Tetrad personality traits (e.g., narcissism, Machiavellianism, psychopathy, and sadism). Furthermore, in addition to personality traits, the current study explored if negative social reward would also predict trolling behaviours.

1.1. Trolling, social media, and Facebook®

With over 3.2 billion people around the world actively accessing the Internet on a daily basis (International Telecommunication Union, 2015), the Internet has become an extension of our face-to-face world, where we engage in personal, social, and business interactions. Along with the positive social aspects of increased virtual opportunities to socialise and communicate, new and diverse antisocial behaviours have also emerged online (Williams, 2000). Although dependent on individual differences, online forms of antisocial behaviour (such as harassment) are associated with the same emotional and psychological outcomes as face-to-face forms harassment such as depression, social anxiety, and low levels of self-esteem (Nicol, 2012).

Facebook®, one of the most popular social media sites, has become the Internet's biggest playground for engaging in antisocial behaviours, particularly trolling (Pew Research Centre, 2014). The open access of Facebook® enables users to access the site and manipulate personal information for their own means and advantage, thus allowing trolling to occur very easily (Marwick & Ellison, 2012). Phillips (2011) suggests that trolls create anti-social networks on Facebook®, identifying themselves to other trolls on Facebook® by flagging their profile names and pictures with well-known trolling and internet references. However, current research on trolling behaviours on SNSs, specifically Facebook®, is fragmented, limited, and warrants further exploration.

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1.2. Defining trolling behaviours

Due to the limited research conceptualising trolling behaviours, Hardaker (2010) conducted a content analysis on discussions about trolling behaviours by internet users that appeared on a non-centralised computer network for topical discussions. Hardaker's (2010) analysis identified four fundamental characteristics central to trolling behaviour: deception, aggression, disruption, and success.

Deception was noted by Hardaker (2010) as characteristically important to trolling behaviours, suggesting that people who engage in trolling often portray themselves differently on their 'trolling profile/s'. In addition, aggression was often used tactically by individuals that engage in trolling behaviour (Hardaker, 2010). By employing malicious taunts and provocative comments, trolls are able to annoy or emotionally provoke others into retaliating. Thirdly, individuals who engage in trolling are typically noted to employ what often seems to be meaningless disruptions aimed at attention-seeking and/or generating reactive responses from others (Hardaker, 2010). The combination of the characteristics of deception, aggression, and disruption leads to the fourth characteristic of trolling behaviours: success. Hardaker (2010) suggests that individuals who engage in this behaviour are motivated by the success in deceiving, aggravating, and disrupting the people they troll. If this success doesn't result, in that their provocative attempts are ignored or misplaced, the trolling individuals may increase and heighten their trolling attacks, or move on to new opportunities.

Hardaker (2010) also distinguished trolling behaviours from other forms of antisocial online misconduct. For example, the characteristics of deception and meaningless disruption unique to trolling distinguish this behaviour from cyber-bullying (Lenhart, 2012). Although trolling behaviours and cyber-bullying share aggressive attributes (Dooley, Pyżalski, & Cross, 2010), cyber-bullies are not characteristically deceptive or meaninglessly disruptive. Research on cyberbullying suggests quite the contrary; that cyber-bullies are often known to their victims in real life (Dooley et al., 2010), and the harassing behaviour involved in cyber-bullying is very direct and specifically targeted (Steffgen, König, Pfetsch, & Melzer, 2011). Thus, this suggests a distinct difference between trolling and cyberbullying.

1.3. Trolling behaviours: Personality and motivation

The domain of dark personality traits is an area of investigation relating to interpersonal online misconduct (e.g., Nevin, 2015), due to strong links between these traits and socially destructive and malevolent behaviours. Originally known as the Dark Triad of personality traits (e.g., narcissism, psychopathy, and Machiavellianism), the recent addition of everyday sadism has resulted in a Dark Tetrad constellation of personality (Buckels, Jones, & Paulhus, 2013). The Dark Tetrad are united by a handful of central characteristics, such as social manipulation, the drive for ruthless self-advancement, and most notably a lack of empathy (see Buckels et al., 2013 for an indepth description of the Tetrad).

Although research on trolling behaviours is limited, recent research has identified associations between the Dark Tetrad and trolling behaviours (Buckels, Trapnell, & Paulhus, 2014). Specifically, the trait of everyday sadism was found to be the most robust when predicting trolling behaviours (Buckels et al., 2014). Buckels et al. (2014) highlight the significance of studying Dark Tetrad personality traits to further understand and profile trolls.

In addition to personality traits, it is also of interest to understand motivational factors that lead individuals to engage in trolling behaviours on Facebook®. In general terms, motivation to engage in any behaviour is determined by the outcomes, and individuals are reasonably more motivated to engage in behaviours that provide outcomes that are personally rewarding (Deci & Ryan, 2000). Thus, understanding the rewards valued by individuals that engage in trolling behaviours is central to a deeper understanding of what motivates people to troll. Given that the success of trolling behaviours is reliant on the

interaction with others, the social interaction of trolling behaviour may be significant motivational component. Therefore, the current study will explore social rewards that may motivate trolling behaviour.

Social rewards are conceptualised as typical or atypical, with typical social rewards defined as prosocial, socially accepted rewards and atypical social rewards as socially negative unaccepted forms of reward, commonly associated with selfish or self-serving behaviours and interaction (Foulkes, Viding, McCrory, & Neumann, 2014). Foulkes, Viding, et al. (2014) established six domains of social rewards, with five typical social rewards (e.g., Admiration, Passivity, Prosocial Interactions, Sexual Reward, and Sociability), and one atypical social reward (e.g., negative social potency). Foulkes, Viding, et al. (2014) proposed that each domain offered a unique set of associations with personality traits, social attitudes and goals.

Foulkes, Viding, et al. (2014) found negative social potency to be positively associated with Dark Triad personality traits (narcissism, Machiavellianism, and psychopathy) and hostile interpersonal goals. This suggests that individuals who seek negative social potency are likely to enjoy inflicting psychological pain and distress onto others through exerting negative social influence, power, and strength (Foulkes, Viding, et al., 2014). Social reward, specifically negative social potency, offers a classification and acknowledgment of motivation to engage in face-to-face antisocial behaviours (Foulkes, McCrory, Neumann, & Viding, 2014; Foulkes, Viding, et al., 2014). However, this type of social reward is yet to be explored in reference to Facebook® and SNS antisocial behaviour, such as trolling.

1.4. Aim and hypotheses

Further investigation of trolling behaviours on SNSs is warranted to create a more detailed character profile of individuals who engage in trolling behaviour. As such, the aim of this research project is to investigate the relationship between the Dark Tetrad (i.e., sadism, Machiavellianism, psychopathy, and narcissism) personality traits, social reward (specifically negative social potency) and Facebook® trolling behaviours. It is hypothesised, based on previous research, that higher levels of Dark Tetrad personality traits (i.e., narcissism, Machiavellianism, psychopathy, and sadism) will predict Facebook® trolling behaviours. In addition to the variance explained by Dark Tetrad traits, it is hypothesised that high levels of negative social potency will also predict Facebook® trolling behaviours.

2. Method

2.1. Participants

The sample consisted of 396 adults aged between 18 and 77 years of age (M age = 34.41, SD = 1.70). Of the sample, there were 296 (75.90%) women and 94 (24.10%) were men. To participate in the study, participants were required to be at least 18 years of age and have an active Facebook® account.

2.2. Materials

An online survey package provided to participants via SurveyMonkey included demographic questions (such as age and sex) and five measures: The Global Assessment of Facebook® Trolling, Social Rewards Questionnaire, The Dirty Dozen and The Short Sadistic Impulse Scale.

2.2.1. The Global Assessment of Facebook® Trolling

A modified and extended version of Global Assessment of Internet Trolling (GAIT; Buckels et al., 2014) was used to assess participants' trolling behaviour. For the purpose of the current study, the wording of the four item GAIT was modified to reflect Facebook® trolling, rather than internet trolling in general; e.g. 'I have sent people to shock

websites for the lulz' was modified to 'I have shared or sent disturbing or controversial Facebook® posts for the lols (i.e. for the laughs)'. Five new items were also added to extend the GAIT, as Field (2013) suggests four item scales do not adequately address content validity. The Facebook® specific item modifications and item additions to the GAIT in this study formed a new measure: The Global Assessment of Facebook® Trolling (GAFT; Cronbach's $\alpha = 0.70$). Participants responded by indicating how much they agreed or disagreed on a five-point scale (1 = Strongly Disagree, 5 = Strongly Agree) with statements such as "I enjoy upsetting people on Facebook®".

2.2.2. The Short Sadistic Impulse Scale

The Short Sadistic Impulse Scale (SSIS; O'Meara, Davies, & Hammond, 2011) was used to measure participant's level of trait sadism. Previous studies employed the SSIS have established good concurrent validity (e.g., O'Meara et al., 2011). Participants responded on a dichotomous scale (0 = Unlike Me; 1 = Like Me) to 10 statements such as 'People would like hurting others if they gave it a go'. The SSIS was shown to have a lower than expected internal consistency for the current sample, with Cronbach's $\alpha = 0.58$.

2.2.3. The Dirty Dozen

The Dirty Dozen (Jonason & Webster, 2010) has both established convergent and discriminant validity, and was used to measure participants levels of the dark triad traits (Machiavellianism, narcissism, and psychopathy). The 12 item self-report questionnaire consists of three subscales, one for each personality trait. Participants responded to all items by indicating how much they agreed or disagreed on a nine-point scale (1 = Disagree Strongly, 9 = Agree Strongly) with statements such as, 'I have used deceit or lied to get my way' (i.e., Machiavellianism), 'I tend to want others to admire me' (i.e., narcissism), and 'I tend to lack remorse' (i.e., psychopathy). For the current sample, the Dirty Dozen scale was also found to have excellent reliability (Cronbach's $\alpha = 0.87$), and each subscale respectively; Machiavellianism $\alpha = 0.80$, narcissism $\alpha = 0.82$, and psychopathy $\alpha = 0.75$.

2.2.4. The Social Rewards Questionnaire

The Social Rewards Questionnaire (SRQ; Foulkes, Viding, et al., 2014) has established construct validity and test-retest reliability, and thus was used to assess participants value of negative social potency type of social reward. The questionnaire consisted of six subscales, each representing a specific type of social reward: Admiration, negative social potency, passivity, prosocial interactions, sexual relationships and sociability. For the aim of this study, only the negative social potency subscale was of interest. Participants respond to all items on a seven-point scale (1 = Disagree Strongly, 7 = Agree Strongly) in response to statements such as "I enjoy making someone angry" and "I enjoy embarrassing others". For the current sample, both the SRQ and the negative social potency subscale were found to have good overall internal consistency, Cronbach's $\alpha = 0.78$ and 0.81 , respectively.

2.3. Procedure

Participants were recruited through a snowball sampling technique via Facebook®, email distribution and printed flyers. Advertisements provided a URL link directing potential participants to the online survey hosted by surveymonkey.com. Participants were also informed that their participation was voluntary, that they were free to withdraw at any stage, and about the details regarding the use, storage and confidentiality of any data collected. Participants were asked for their consent to participate and were then provided with the survey package to complete online. Upon completion of the questionnaire, students were thanked for their involvement.

3. Results

Data was first analysed for missing values and statistical assumptions. Missing value analyses of scales of Facebook® trolling behaviours, sadism, Machiavellianism, psychopathy and negative social potency were all under 5%. Due to potential validity concerns that may occur with responses on the trolling scale, all individual items of this scale were assessed for non-responsiveness (i.e., missing values <5%) and ceiling effects ($\leq 80\%$ of responses at the high or low anchor of the scale). However, no item showed cause for concern.

Distributions of these scales were found to violate normality, and visual inspection of Q-Q plots and boxplots revealed the presence of univariate outliers. However, as removal of outliers did not impact results, and additionally the *F* test is considered robust to violations of normality (Keppel & Wickens, 2004), the outliers were retained. An examination of correlations between predictor variables revealed that correlations between predictors did not exceed 0.7, which is considered to meet assumptions of multicollinearity (Field, 2013).

The mean score, standard deviation and correlation coefficients for Facebook® Trolling Behaviours, sadism, Machiavellianism, psychopathy, narcissism, and negative social potency are presented in Table 1. Descriptive statistics for men and women and significant sex differences for variables are presented in Table 2.

A bivariate correlation analysis was run examining Pearson's Correlation Coefficient (*r*) to investigate the relationships between age, gender, sadism, Machiavellianism, psychopathy, narcissism, negative social potency, and Facebook® trolling behaviours. Pearson's correlation coefficient results are displayed in Table 3.

To test the hypotheses, a 3 step hierarchical multiple regression analysis (HMRA) was run. To account for the significant associations between age, gender, and Facebook® trolling, the predictors of age and gender were entered at step 1. Following this, the Dark Tetrad traits were entered at step 2, and negative social potency was entered at step 3.

At step 1, age and gender significantly explained 13.0% (adjusted R^2) of the total variance in Facebook® trolling behaviours, $R^2 = 0.14$, $F(2, 336) = 26.27$, $p < 0.001$, $f^2 = 0.16$. By Cohens (1988) conventions, this is considered a medium effect. At step 2, the addition of the Dark Tetrad traits significantly explained 24.1% (adjusted R^2) of the total variance in Facebook® trolling behaviours, $R^2 = 0.25$, R^2 change = 0.12, $F(6, 332) = 18.89$, $p < 0.001$, $f^2 = 0.33$. By Cohens (1988) conventions, this is considered a large effect. This change was also significant, *F* Change (4332) = 13.28, $p < 0.001$. At step 3, the addition of negative social potency to age, gender, and the Dark Tetrad traits explained 30.6% (adjusted R^2) of the total variance in Facebook® trolling behaviours, $R^2 = 0.32$, R^2 change = 0.07, $F(7, 331) = 22.25$, $p < 0.001$, $f^2 = 0.47$. By Cohens (1988) conventions, this is considered a large effect. This change was also significant, *F* Change (1331) = 31.87, $p < 0.001$. Unstandardised (*B*) and Standardised (β) regression coefficients and *t*-tests are shown in Table 4.

Table 4 shows that at step 1, both gender and age were significant negative predictors of Facebook® trolling behaviours. At Step 2, only

Table 1

Descriptive statistics for Facebook® trolling, sadism, Machiavellianism, psychopathy, narcissism, and negative social potency and correlation with ages.

Variable	<i>N</i>	<i>M</i>	Median	<i>SD</i>	Age correlation
Facebook® trolling	345	13.17	13.00	4.51	−0.13*
Sadism	345	0.83	1.00	1.17	−0.09**
Machiavellianism	345	13.81	13.00	6.50	−0.20***
Psychopathy	345	10.59	9.00	5.67	−0.08
Narcissism	345	18.00	19.00	7.09	−0.13*
Negative social potency	345	9.18	8.00	4.31	−0.18***

p-Value is two-tailed.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 2

Male and female descriptive statistics for Facebook® trolling, sadism, Machiavellianism, psychopathy, narcissism, and negative social potency.

Variable	Male M	Male SD	Male N	Female M	Female SD	Female N	Gender difference (M-F)
Facebook® trolling	15.86	4.58	87	12.52	4.00	292	3.34***
Sadism	1.32	1.58	77	0.68	0.99	266	0.64***
Machiavellianism	16.44	6.89	78	13.09	6.16	269	3.35***
Psychopathy	13.62	6.82	78	9.76	4.97	269	3.86***
Narcissism	19.73	6.88	78	17.48	7.01	269*	2.25**
Negative social potency	11.67	5.78	82	8.54	3.48	274	3.13***

Independent-measures *t*-tests were conducted to test sex differences with Bonferroni adjustment applied to correct familywise error.

p-Value is two-tailed.

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

gender, sadism, and negative social potency were significant positive predictors of Facebook® trolling behaviours. Finally, at step 3, only gender (negative) and negative social potency (positive) were significant predictors of Facebook® trolling behaviours.

It was of interest why the addition of negative social potency as a predictor caused psychopathy and sadism to no longer significantly predict trolling behaviours. As such, it was possible that the predictive utility of sadism and psychopathy regarding Facebook® trolling behaviour may be moderated by negative social potency. To test this potential, a PROCESS moderation analysis was performed and results are reported in Table 5.

As shown in Table 5, the variable of negative social potency did not moderate the effect of predictors.

4. Discussion

The aim of this research was to examine the predictive utility of the Dark Tetrad (i.e., narcissism, Machiavellianism, psychopathy, and sadism) and social reward (specifically negative social potency) on Facebook® trolling behaviours. Based on previous research, it was hypothesised that higher levels of Dark Tetrad traits would predict Facebook® trolling behaviours, and this hypothesis received partial support. In addition to the variance explained by Dark Tetrad traits, it was hypothesised that high levels of negative social potency would predict Facebook® trolling behaviours and results showed support for this hypothesis. The predictor variables will be discussed in relation to predicting Facebook® trolling behaviours, in order of the HMRA.

Table 3

Pearson's correlation coefficients between predictor variables of age, gender, sadism, Machiavellianism, narcissism, psychopathy, and negative social potency and criterion variable of Facebook® trolling behaviours.

Variable	1	2	3	4	5	6	7
1. Age							
2. Gender	−0.02**						
3. Sadism	−0.09	−0.23***					
4. Mach.	−0.20***	−0.21***	0.43***				
5. Narcissism	−0.13*	−0.15*	0.24***	0.58***			
6. Psychopathy	−0.08	−0.29***	0.44***	0.57***	0.29***		
7. NSP	−0.18***	−0.33***	0.53***	0.61***	0.32***	0.64***	
8. Trolling	−0.13*	−0.34***	0.35***	0.34***	0.18***	0.39***	0.53***

NSP = negative social potency, Trolling = Facebook® trolling behaviours, Mach. = Machiavellianism.

p-Value is two-tailed.

* *p* < 0.05.

** *p* < 0.01.

*** *p* < 0.001.

4.1. The Dark Tetrad of personality predicting Facebook® trolling behaviours

4.1.1. Narcissism

Contrary to predictions, trait narcissism did not predict Facebook® trolling behaviours. However, the motivation to engage in this behaviour may explain this result. Research suggests that individuals with high levels of trait narcissism engage in behaviour that is characterised by “self-absorption” (Ackerman et al., 2011, p. 6). As such, individuals with high trait narcissism may be too self-interested to be concerned with purposely disrupting other users on Facebook® through trolling behaviours.

4.1.2. Machiavellianism

Also contrary to predictions, trait Machiavellianism did not predict Facebook® trolling behaviours. However, the distinctive behavioural components unique to Machiavellianism may possibly explain this result. Jones and Paulhus (2009) suggest that although commonly cruel, manipulative, and exploitative, individuals with high trait Machiavellianism are also calculating, strategic, and can commonly exercise impulse restraint. Considering the fast and responsive conversational environment akin to Facebook® trolling, it is reasonable to suggest that Facebook® may not be an optimal environment for Machiavellianism's manipulative, deceptive behaviour.

4.1.3. Psychopathy

Trait psychopathy was found to be a significant positive predictor of Facebook® trolling behaviour, providing support for the first hypothesis and corroborating previous research of Buckels et al. (2014). Thus, individuals who troll on Facebook® are more likely to lack empathy, be driven by the satisfaction of predatory impulses, and show a brazen disregard for the psychological distress caused to others (e.g., Lilienfeld et al., 2014).

4.1.4. Sadism

Results showed that sadism was a significant positive predictor of Facebook® trolling behaviours, also providing the first hypothesis and corroborating previous research of Buckels et al. (2014). Therefore, Facebook® trolls are also more likely to be merciless, emotionally cruel, and are driven by the pleasure they obtain through others pain and discomfort.

4.2. Negative social potency predicting Facebook® trolling behaviours

In addition to the Dark Tetrad traits, it was predicted that the social reward of negative social potency would predict Facebook® trolling behaviours. Results supported this hypothesis; specifically, high levels of negative social potency were found to predict Facebook® trolling activity. This result provides support for previous research of Foulkes, Viding,

Table 4

Summary of the hierarchical multiple regression analysis for age, gender, sadism, Machiavellianism, narcissism, psychopathy, and negative social potency predicting Facebook® trolling behaviours.

Variable	B	SE	β	t
Step 1				
Constant	21.29	1.19		
Age	−0.05	0.02	−0.14	−2.68**
Gender	−3.61	0.53	−0.34	−6.78***
Step 2				
Constant	15.69	1.47		
Age	−0.03	0.02	−0.09	−1.76
Gender	−2.42	0.53	−0.23	−4.61***
Sadism	0.62	0.21	0.16	2.914***
Machiavellianism	0.08	0.05	0.11	1.58
Psychopathy	0.15	0.05	0.19	3.16***
Narcissism	−0.02	0.04	−0.02	−0.42
Step 3				
Constant	13.00	1.48		
Age	−0.02	0.02	−0.06	−1.22*
Gender	−1.94	0.51	−0.19	−3.81***
Sadism	0.29	0.21	0.07	1.36
Machiavellianism	−0.00	0.05	−0.00	−0.04
Psychopathy	0.05	0.05	0.06	1.03
Narcissism	−0.01	0.03	−0.01	−0.25
Negative social potency	0.41	0.07	0.38	5.65***

p-Value is two-tailed.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

et al. (2014), who found negative social potency to be predictive of antisocial behaviours. The current study also corroborates Foulkes, McCrory, et al. (2014), who found that individuals who seek negative social potency engage in negative social behaviours that involve the callous treatment of others. In sum, Facebook® users who engage in trolling behaviours are likely to be intrinsically motivated by obtaining negative power and influence over other people as a social reward.

It was of interest is why the addition of negative social potency resulted in trait sadism and psychopathy no longer significantly predicting the behaviour. Furthermore, moderation analyses showed that negative social potency was not a significant moderator of these traits and trolling behaviours. However, a potential explanation may lie in the inherent connection between trait sadism and psychopathy, and negative social rewards. For example, Foulkes, McCrory, et al. (2014) suggest that individuals high in trait psychopathy may be motivated by negative social potency in their interpersonal interactions. Specifically, individuals high in trait psychopathy take pleasure in treating others cruelly (Foulkes, McCrory, et al., 2014, p. 8), a trait that would also be common in individuals of high sadism levels. As such, the opportunity of negative social rewards may be the underlying motivation for these individuals engaging in Facebook® trolling behaviour. This would explain how trait psychopathy and sadism positively predicted Facebook® trolling behaviours until negative social potency was introduced. Most interestingly, the current study suggests that perhaps it is

Table 5

PROCESS analysis for negative social potency moderating predictive utility of trait sadism and psychopathy.

Variable	B	SE B	t
Constant	7.19	1.10	
Negative social potency	0.55	0.12	4.75***
Sadism * psychopathy	0.10	0.07	1.91**
Interaction	−0.00	0.01	−0.38*

p-Value is two-tailed.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

social motivation, not personality, which best predicts online trolling behaviours.

4.3. Additional considerations: Age and gender

Although not related to the specific predictions of the current study, results showed that both age and gender were negatively correlated with Facebook® trolling behaviours. However, although age lost its predictive utility at the addition of the Dark Tetrad traits, gender remains a significant negative predictor throughout the regression model. Specifically, men were more significant predictors of Facebook® trolling behaviours, a result consistent with previous research on trolling (e.g., Buckels et al., 2014). Future research should endeavour to further explore this sex difference, examining interactions between gender, personality traits, and social rewards in an effort to properly predict antisocial behaviours online.

4.4. Limitations and future research

The sampling procedure, specifically participation being voluntary and anonymous, may have had an influence on the results as it is impossible to determine whether or not the self-report questionnaire on trolling behaviours has in fact been trolled. For example, it is likely that due to the very nature of trolling behaviour, some participants might have chosen to report false and misleading answers purposely (i.e., to troll the questionnaire). However, as all self-report surveys may be subject to potential selection bias, in an effort to address this potential bias the term 'trolling' was not present in participant recruitment advertisements and in the questionnaire itself.

A further limitation of the current sample is the high proportion of woman (75.9%) in comparison to men. As results did show a significant difference between men and women's Facebook trolling behaviour (i.e., men engaged in Facebook trolling more often than women), future research should seek to address this gender sample disparity when assessing trolling behaviours.

There were also limitations regarding the psychometric validity and consistency of two measures used in the current study. Firstly, given the current study was the first to employ the Global Assessment of Facebook® Trolling (GAFT), the psychometric validity of this measure is limited to indices generated in this study. Although the GAFT has generated sufficient internal consistency (Cronbach's $\alpha = 0.76$) and the inclusion of more items may increase the scale's construct validity (e.g., Field, 2013), further studies are required to validate the psychometric properties of this measure before generalisability can be assured. Secondly, the internal consistency of the Short Sadistic Impulse Scale (SSIS; O'Meara et al., 2011) was low and therefore potentially problematic. However, as the SISS has a relatively short history in the literature the current study adds to the body of research on the psychometric properties of this measure.

4.5. Implications of current research

The current study has highlighted key personality and motivators predictive of Facebook® trolling behaviours. Such information may contribute towards reducing and minimise the harmful and disruptive effects associated with SNS trolling (especially Facebook® trolling). Therefore, results of the current study have implications for individuals who work within social media agencies and SNS administrators, specifically those involved in policy, data, content, marketing and public relations.

To minimise harmful psychological effects, it is important to increase education about trolling. Results of this research could be used to educate Facebook® users about personality characteristics of Facebook® trolls (i.e., trait sadism and psychopathy), what motivates trolls, and what they gain from trolling (i.e., having power and dominance over others). By educating Facebook® users that the goals of trolling are to

cause social chaos through negative interpersonal interactions, this may empower users to take more educated action against trolling behaviour and hopefully reduce its negative impact.

4.6. Conclusions

The current study has been the first to investigate the utility of Dark Tetrad personality traits and atypical social reward when predicting Facebook® trolling behaviours. Results have supported and extended previous research by providing new evidence regarding the personality traits and motivations of individuals that engage in Facebook® trolling. In sum, the current findings suggest that individuals that engage in trolling behaviours on Facebook® are characterised by a lack of empathy, callousness, and enjoyment of others distress (as indicated by high levels of sadism and psychopathy), and are driven by gaining negative power and influence over others (as indicated by high levels of negative social potency). Importantly, the results indicate that trolls are individuals who use Facebook® as a way to gratify their desire for negative social power by creating social chaos and negative interpersonal interactions.

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