

AN EXPLORATORY STUDY OF PSYCHOSOCIAL FACTORS
THAT ARE RELATED TO TROLLING BEHAVIORS
ON SOCIAL MEDIA

by

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DEDICATION

To my parents.

Without your endless support, love, and prayers, I would not be where I am today.

I love you both.

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LIST OF ABBREVIATIONS

Abbreviation	Description
ETB	Exhibiting Trolling Behaviors
NETB	Do Not Exhibit Trolling Behaviors

ABSTRACT

The purpose of this study was to explore the demographic factors, social media behaviors, and psychosocial factors most associated with trolling behaviors on social media. Although minimal research has been done on trolling behaviors, previous literature on bullying and other malicious online behaviors has shown several social media and psychosocial factors associated with the behaviors. Methods: A total of 504 psychology and mass communication students from Texas State University were recruited for the study. Participants were asked to complete a survey in which they responded to questions about demographics and social media, as well as tendencies, and questions from a set of validated personality and psychosocial instruments. Based on their responses to three specific social media behavior questions, the participants were then placed into two groups: those who exhibit trolling behaviors (ETB) and those who do not exhibit trolling behaviors (NETB). Results: Based on the final regression model, males were more likely to exhibit trolling behaviors. For social media behaviors, both greater need for social media and greater likelihood to make downward comparisons were found to be significant predictors of trolling behaviors. Lack of perspective taking, a subscale of the empathy measure, was also found to be a significant indicator of trolling behaviors. Conclusions: Results from this study suggest further research should be done in examining predictors of trolling behaviors on social media in order to gain a better understanding of the emerging malicious online behavior.

I. INTRODUCTION

Within the last decade, 80% of internet users report using social networking sites which accounts for a quarter of the time spent online (Comscore, 2011). Due to an increase in social media use, bullying and other malicious online behaviors have made an appearance in cyberspace. Across most studies in the past ten years, prevalence rates of cyberbullying range from 10% to 40% depending on how cyberbullying was defined (Lenhart, 2010; O'Brennan, Bradshaw, & Sawyer, 2009). Recently, a phenomenon referred to as trolling has emerged in the literature. In many ways trolling is similar to cyberbullying in that technology is used to cause harm and distress (Nichol, 2012). But it is important to note the differences between the two malicious online behaviors. Unlike cyberbullies, trolls often do not know the group or person they are attacking (Nichol, 2012).

Because of the recent emergence of trolling, there is limited research on the phenomenon. This thesis will provide an exploratory study of psychosocial factors that are related to trolling behaviors on social media. In addition, a discussion will further examine how social media and psychosocial variables may predict trolling behaviors. The purpose of this study is to gain a better understanding of trolling behaviors and the variables associated with the phenomenon. By identifying these variables, it will give more insight on this malicious online behavior and ways to identify predictors of trolling behaviors.

II. LITERATURE REVIEW

Advancement in technology has made access to the internet and social media easier than ever. According to Pew Research Center (2018), in 2005, just 5% of Americans were on social media. Since then, the numbers have dramatically increased to 69% in 2018. Young adults have consistently used social media sites, continually reporting the highest usage in comparison to older generations (Pew Research Center, 2018). While there are potential benefits to social media, such as connectivity with friends and family and increased feelings of social support (LaRose, Eastin, & Gregg, 2001; Shaw & Gant, 2002), antisocial online behavior has increased.

Cyberbullying

Traditional bullying has extended from physical interactions to virtual (Ang & Goh, 2010). According to Pew Research Center (2017), 67% of young adults have experienced some form of online harassment from name-calling (46%) and purposeful embarrassment (37%), to physical threats (25%) and sustained harassment (16%) (Pew Research Center, 2017). Fifty-eight percent of young adults report that social media is the most common venue of online harassment with many not knowing who their harasser is (Pew Research Center, 2017).

It has been suggested that malicious online behavior may have a longer lasting impact on the victim compared to traditional bullying (Park, Na, & Kim, 2014). The Internet allows bullies to say and do things anonymously and with little adult supervision. In a study done by Kowalski and Limber (2007), the researchers investigated the prevalence of cyberbullying in middle school students in the United States. It was found that 11% of the middle schoolers were victims of cyberbullying, 7% reported being both

bullied and bullying others via cyberspace, and 4% reported being a cyberbully at least once within the last two months. It was also found that about half of the victims reported not knowing their bully (Kowalski & Limber, 2007).

Trolling

A phenomenon known as ‘trolling’ has recently emerged in the literature related to cyberbullying and other malicious online behavior. While cyberbullying is defined as a way to intentionally harm a specific person or group of persons (Patchin & Hinduja, 2006; Nichol, 2012), ‘trolling’ refers to a specific type of online behavior that serves to aggravate, annoy, and disrupt online interactions and communication (Coles & West, 2016).

Several definitions of trolling have been offered by researchers to account for observed differences in trolls’ behaviors (Coles & West, 2016; Hardaker, 2010; Shachaf & Hara, 2010). One definition put forth by Bishop (2012a) suggests that ‘trolling’ may be the use of unconstructive messages to provoke others to potentially start arguments. According to Shachaf and Hara (2010), ‘trolling’ may be repetitive, harmful actions that go against some websites’ terms of use. Binns’ (2012) definition of trolling refers to the posting of offensive messages to create arguments or start debates.

Hardaker (2010) analyzed nine years of online interactions investigating users who posted about trolls on public domains. In her study, four characteristics emerged in relation to trolls: deception, aggression, disruption, and success. Trolls often take on different identities or go “undercover” when attacking their victims in order to deceive them. The findings also suggested that trolls are often aggressive, provoking others into retaliation (Hardaker, 2010). Trolls are also found to be attention-seeking which is often

expressed through disruptive tendencies, such as meaningless, repetitive posts. Lastly, Hardaker (2010) found that trolls are motivated by success. If they do not successfully troll, they will heighten their game until they succeed.

Bishop and colleagues (2013a) suggested that “trolls” and “trolling” can be divided into sub-categories including ‘lurkers,’ ‘flame trolls,’ ‘snerts,’ ‘rippers,’ and ‘kudos trolls.’ The most reserved trolling behavior is the ‘lurker,’ which is characterized by performing actions such as accidental calls, clicking on ‘like’ buttons, or modifying opinion polls, ‘behind the scenes.’ Flame trolls send messages with the intent to harm others for their own amusement and for others’ discomfort (Bishop et al, 2013a). A ‘snert’ intends to harm others for their own entertainment. The trolling behavior known as the ‘ripper’ involves self-deprecating trolling acts in order to build a false sense of empathy from others. Bishop (2012a) identifies a troll that is unlike the others in that there is no intent to harm or cause discomfort to readers, but rather their contribution to interactions causes disruption. They are labeled ‘kudos trolls.’

Since “trolling” has only been defined in recent years, the literature on the behavior is limited. Researchers have only begun to examine psychosocial factors such as personality, empathy, and internet behaviors in relation to trolling behaviors.

Differences between Cyberbullying and Trolling

While this study is investigating trolling behaviors, it is critical that there is a clear understanding of the differences between trolling and cyberbullying. At first glance, trolling and cyberbullying appear to be very similar, and many use the terms interchangeably. In reality, the two behaviors have very different intentions and end-goals.

Cyberbullies seek implicit or explicit pleasure through repetitive mistreatment of specific individuals. They also exhibit perceived or actual power over their victims (Patchin & Hinduja, 2006). Cyberbullying is often focused on an individual or group of people and the target or victim is known to the bully (Nichol, 2012).

On the other hand, trolling behaviors are not limited to a specific person or group of persons and there may be no previous connection to the targets (Nichol, 2012). Trolling behaviors can be distinguished from cyberbullying in that the characteristics of deception and meaningless disruption are unique to trolling (Lenhart, 2012). Trolls are also motivated by circumstantial factors such as boredom, attention-seeking, and revenge (Shachaf & Hara, 2010). And unlike cyberbullying, the intent of trolling is to introduce conflict, provoke emotional reactions, and disrupt communication for the troll's own amusement (Hardaker, 2010).

Personality and Bullying

Allport (1961) defines personality as “a dynamic organization, inside the person, of psychophysical systems that create the person's characteristic patterns of behavior, thoughts and feelings” (p. 48). Until the middle of the 1990s, personality as an influence on bullying behaviors had not been investigated. A meta-analysis of bullying and personality literature since then found a lower level of agreeableness and conscientiousness and a higher level of neuroticism and extraversion in relation to both bullying and victimization (Mitsopoulou & Giovazolias, 2015).

Since bullying is not only a face-to-face occurrence anymore, the literature on personality and malicious online behaviors is growing extensively. Studies have focused primarily on the domain of the dark personality traits in relation to these malicious acts.

Originally known as the Dark Triad of personality traits (narcissism, psychopathy, and Machiavellianism), a recent addition of “sadism” has resulted in the Dark Tetrad (Buckels, Jones, & Paulhus, 2013). The personality traits of the Dark Tetrad are associated by characteristics, such as social manipulation, the drive for self-advancement, and lack of empathy (Buckels, Jones, & Paulhus, 2013). The Dark Tetrad has been associated with face-to-face bullying in adolescents (Fanti & Kimonis, 2013) and adults (Baughman, Dearing, Giammarco, & Vernon, 2012; Jones & Paulhus, 2010; Linton & Power, 2013).

Recent research has investigated associations of trolling with the Dark Tetrad along with the Big Five personality factors, which includes extraversion, agreeableness, openness, conscientiousness, and neuroticism (Buckels, Trapnell, & Paulhus, 2014). Buckles and colleagues (2014) were particularly interested in enjoyment of trolling behaviors. The first study focused on enjoyment of trolling compared to other online activities, while the second study focused particularly on enjoyment of commenting activities. Psychopathy (Craker & March, 2016; Sest & March, 2017) and sadism (Buckels, Trapnell, & Paulhus, 2014; Craker & March, 2016; Sest & March, 2017) had the most robust associations with trolling. It was also found that those who claimed to enjoy trolling were higher on extraversion and lower on agreeableness compared to others. In regards to commenting activities, there was a strong positive association between commenting frequency, trolling enjoyment, and trolling behaviors (Buckels, Trapnell, & Paulhus, 2014).

Empathy and Bullying

The general definition of empathy is an experience or feeling felt when observing the experience of another (Mitsopoulou & Giovazolias, 2015). But the construct is more complex than a generalized definition. Empathy is multidimensional. It can be split into two constructs: affective and cognitive. Affective empathy is the ability to experience, internalize, and share others' emotions (Mehrabian & Epstein, 1972; Baron-Cohen & Wheelwright, 2004), while cognitive empathy is the ability to recognize and understand others' emotions (Hogan, 1969; Mitsopoulou & Giovazolias, 2015).

Research on empathy and bullying is extensive. A common belief is that bullies lack empathy, but research has shown otherwise. Due to the complexity of empathy, it should not be readily assumed that those who perform malicious acts are deficient in this construct. Research over the years has produced mixed results in relation to the association between empathy and bullying. Jolliffe and Farrington (2006) found a negative relationship between empathy and face-to-face bullying, but only in affective empathy –not cognitive empathy. In 2016, van Noorden and colleagues investigated the effects of frequency and severity of bullying with regards to empathy. They found a negative association between bullying and both cognitive and affective empathy. The results of this study are similar to what has been found in online bullying (Ang & Goh, 2010).

Ang and Goh (2010) investigated the influence of both affective and cognitive empathy and gender on cyberbullying behavior. Empathy was measured using the Basic Empathy Scale, which is a 20-item measure assessing cognitive and affective empathy. They found that both boys and girls with low levels of affective empathy produced

similar responses –those who had low levels of cognitive empathy reported more cyberbullying behaviors compared to those who had high levels of cognitive empathy. Interestingly, boys with high levels of affective empathy reported a similar pattern. On the other hand, girls with high levels of affective empathy, reported cyberbullying behaviors at both low and high levels of cognitive empathy (Ang & Goh, 2010). Based on this study, high levels of affective empathy may act as a buffer of low cognitive empathy on cyberbullying behaviors, but more readily for girls versus boys.

Minimal research has been done on empathy and other online antisocial behaviors, such as trolling. Sest and March (2017) investigated empathy as a predictor of trolling and learned that both affective and cognitive empathy significantly predicted trolling behaviors. While a negative relationship was found between affective empathy and trolling, more complex results were found in relation to cognitive empathy. A positive relationship between trolling and cognitive empathy suggests that trolls recognize and are aware of what their victims are feeling and experiencing (Sest & March, 2017).

Social Support and Bullying

Out of the psychosocial factors, social support is the most researched and well-documented regarding physical health outcomes (Berkman, Glass, Brissette, & Seeman, 2000; House, Landis, & Umberson, 1988; Uchino, 2004). It is defined as one's perception of potential care, appreciation, and inclusion by people in their social network (Demaray, Malecki, Davidson, Hodgson, & Rebus, 2005). It is a communication behavior that plays a key role in maintaining or disrupting mental and physical health (House, Landis, & Umberson, 1988) Studies have found that individuals with low levels

of social support have higher mortality rates, particularly related to cardiovascular problems (Berkman, Leo-Summers, & Horwitz, 1992; Brummett et al., 2001).

When personal computers first became available and internet was accessible in individual households, they were used for interpersonal communication more than anything else (Kraut et al., 1998). Online relationships can be formed through a variety of venues including chat rooms, message boards, and multiuser domains (MUDS). Parks and Roberts (1998) surveyed people who participate in online text-based games and found that 94% of them had formed close friendships or romantic relationships with other players.

Perceived social support is subjectively determined by past experiences and it assesses the degree to which an individual believes he or she could receive social support if needed (Kim, Na, & Park, 2010). Social support has been researched minimally in relation to cyberbullying. With a focus on perceived social support from offline relationships, it has been found that a low level of peer social support is associated with an increase in acts of cyberbullying (Park, Na, & Kim, 2014). Cho and Yoo (2017) were interested in examining cyberbullying across various ages as much of past literature focuses on younger children. The two researchers were also curious how social networking site (SNS) usage, number of friends, and perceived social support associated with cyberbullying.

They found that offline perceived social support was negatively associated with cyberbullying. They also investigated the effects of online perceived social support and found that those who had an online social support were less likely to exhibit cyberbullying behaviors (Cho & Yoo, 2017). As of now, no research has investigated the

role of social support in relation to trolling.

Internet Behaviors and Bullying

Antisocial uses of the internet are highly correlated with frequency of activity. According to the findings from Juvonen and Gross (2008), high internet usage is strongly correlated with cyberbullying. It has also been suggested that narcissists (Ljepava, Orr, Locke, & Ross, 2013) and those who report having antisocial personality disorder (Rosen, Whaling, Rah, Carrier, & Cheever, 2013) use Facebook more frequently in comparison to others. Moreover, the internet is used excessively for personal entertainment specifically by people low on agreeableness (Phillips, Butt, & Blaszczyński, 2006).

Previous literature has investigated several psychosocial factors –personality, empathy, social support, and internet behaviors- in relation to malicious online behaviors. Much of the literature focuses on cyberbullying, while there is limited research on trolling behaviors. The present study addresses gaps in the literature with a focus on psychosocial factors that may predict trolling behaviors on several social media sites including Facebook, Instagram, Snapchat, and Twitter. The following hypotheses have been proposed:

Hypothesis I: High levels of trolling behavior will be associated with a greater need for social media.

Hypothesis II: High levels of trolling behavior will be associated with a greater downward comparison.

Hypothesis III: High levels of trolling behavior will be associated with greater social media addiction.

Hypothesis IV: High levels of trolling behavior will be associated with lower levels of perspective taking and empathic concern.

Hypothesis V: High levels of trolling behaviors will be associated with lower levels of conscientiousness and agreeableness.

Hypothesis VI: High levels of trolling behaviors will be associated with lower perceived social support.

III. RESEARCH DESIGN AND METHOD

Participants

Five hundred and four undergraduate students recruited from Mass Communication and Psychology courses at Texas State University participated in this study. Participants were at least 18 years of age and reported using at least one of four social media applications including Facebook, Twitter, Snapchat, or Instagram. Participants received course credit for completing this survey.

Procedure

Participants completed an anonymous online survey through Qualtrics, which was available on a computer or smartphone. The survey began by asking participants to read a consent form and then they were asked to give consent to participate. The participants were asked to respond to demographic questions, questions about their social media tendencies, and questions from a set of validated personality and psychosocial instruments. Participants were informed that they were allowed to skip any questions they did not feel comfortable answering.

Measures

Demographics. Participants were asked to provide their age, gender, and race/ethnicity.

Psychosocial predictors. To evaluate empathy, the Interpersonal Reactivity Index (Davis, 1983) was used. Three subscales of empathy were evaluated: Perspective-Taking, Empathic Concern, and Personal Distress. The assessment contains 21 items measured on a 5-point Likert-type scale on which participants stated the extent to which

the statement describes them. Example items include: “Sometimes I don't feel very sorry for other people when they are having problems” and “I believe that there are two sides to every question and try to look at them both.” Previous literature using this measure has shown acceptable values for Cronbach’s alpha ranging from .67 to .87 (Hawk et al., 2013). For this sample, the perspective-taking scale ($M = 2.68$, $SD = 0.34$) achieved an alpha reliability of .76, the empathic concern scale ($M = 2.89$, $SD = 0.23$) achieved an alpha reliability of .75, and the personal distress scale ($M = 1.72$, $SD = 0.48$) achieved an alpha reliability of .71.

Conscientiousness and agreeableness were assessed with the Big Five Personality Inventory (John & Srivastava, 1999). The assessment contains 44 items measured on a 5-point Likert-type scale ranging from *Disagree strongly* to *Agree strongly*. Participants indicated the extent to which they agreed to statements. An example statement from this assessment is: “I see myself as someone who.... has an assertive personality.” Previously, this measure has shown acceptable values for Cronbach’s alpha ranging from .78 to .87 (Arterberry, Martens, Cadigen, & Rohrer, 2014). For this sample, the conscientiousness scale ($M = 3.50$, $SD = 0.71$) achieved an alpha reliability of .73 and the agreeableness scale ($M = 3.82$, $SD = 0.43$) achieved an alpha reliability of .75.

Social support was assessed using the Interpersonal Support Evaluation List (ISEL) (Cohen & Hoberman, 1983). Participants were asked to indicate on this 12-item measure whether statements were true or false about themselves on 4-point Likert-type scale ranging from *Definitely false* to *Definitely true*. An example statement includes: “When I need suggestions on how to deal with a personal problem, I know someone I can turn to.” Previous literature using this measure has provided acceptable values for

Cronbach's alpha ranging from .77 to .86 (Cohen, Memelstein, Kamarck, & Hoberman, 1985). For this sample, the ISEL-12 scale ($M = 3.21$, $SD = 0.19$) achieved an alpha reliability of .88.

Social media behaviors. Behaviors often found on social media were measured with both validated scales and items created for the purpose of this study. Intensity of social media use was measured with the Social Media Intensity Scale (Ellison, Steinfield, & Lampe, 2007). This 13-item measure asks about social media intensity in regards to Facebook. It was modified as needed to measure Instagram, Twitter, and Snapchat intensity. Participants completed the scale for each of the four social media outlets used. These questions were measured on a 5-point Likert-type scale that ranged from *Strongly disagree* to *Strongly agree*. Example items include, "Facebook has become part of daily routine" and "I feel out of touch when I haven't logged onto Instagram for a while." The scale originally created by Ellison and colleagues (2007) reached acceptable values for Cronbach's alpha at .83. For this sample, the Facebook scale ($M = 2.49$, $SD = 0.31$) achieved an alpha reliability of .88, the Snapchat scale ($M = 3.76$, $SD = 0.35$) achieved an alpha reliability of .91, the Instagram's scale ($M = 3.38$, $SD = 0.25$) was .92, and the Twitter scale ($M = 3.44$, $SD = 0.21$) achieved an alpha reliability of .94.

To assess the need for social media, the 16-item Need for Participating in Social Media Scale was used (Park, Kee, & Valenzuela, 2009). The scale uses a 6-point Likert-type scale ranging from *Strongly disagree* to *Strongly agree* to assess participants' motivations to use social media. An example statement from this scale is, "I use social media (Facebook, Twitter, Instagram, and Snapchat) to feel like I belong to a community." The scale has previously reached acceptable values of Cronbach's alpha in

all four needs of social media use: socializing: .87, entertainment: .81, self-status seeking: .81, and information: .83 (Park, Kee, & Valenzuela, 2009). For this sample, the scale's ($M = 3.69$, $SD = 0.93$) alpha reliability was .85.

To measure participants' upward and downward comparisons, the 2-item Social Comparison on Social Media measure was used (Vogel, Rose, Roberts, & Eckles, 2014). Participants were asked to respond on a 5-point Likert-type scale ranging from *Not at all* to *A great deal*. The statements used were, "When comparing yourself to others on social media, to what extent do you focus on people better off/ worse off than you?" For this sample, participants' upward comparison scores averaged 2.81 ($SD = 1.23$) and downward comparison scores averaged 2.18 ($SD = 1.06$).

To measure social media addiction, the Bergen Social Media Addiction Scale (Andreassen, Torsheim, Brunborg, & Pallesen, 2012) was used. The 6-item scale measures the frequency with which participants experienced negative effects on their life in the past year from social media use. The scale uses a 5-point Likert scale ranging from *Very rarely* to *Very often*. An example item includes: "How often during the last year have you: Become restless or troubled if you have been prohibited from using social media?" Previously, the scale has reached acceptable values of Cronbach's alpha of .83 (Andreassen, Torsheim, Brunborg, & Pallesen, 2012). The overall scale ($M = 2.63$, $SD = 0.45$) achieved an alpha reliability of .85.

Outcome variable. The outcome variable, trolling behaviors, was measured using three questions developed based on past literature. The 3-item scale measured the extent of debating and intentions to aggravate/irritate. The items were measured on different scales. The items asking, "To what extent do you enjoy the following: Debating various

topics with the intention to irritate/upset others” and “To what extent do you enjoy the following: ‘Trolling’ on public forums” were measured on a 5-point Likert scale ranging from *Not at all* to *Very much*. The item asking, “Please indicate how much you agree with the following statement: I like to post memes and comments with the intent to aggravate or annoy others” was measured on a 5-point Likert scale ranging from *Strongly disagree* to *Strongly agree*.

Trolling behaviors are defined in this study based on certain responses given on the 3-item scale. Participants who select “somewhat” or “very much” in regards to debating and trolling are individuals who exhibit trolling behaviors. Those who select “agree” or “strongly agree” in regards to posting content to aggravate or annoy are also considered to be individuals who exhibit trolling behaviors.

Statistical Analysis

Univariate comparisons were conducted to assess differences in demographics, social media behaviors, and measures of empathy, personality, and social support between individuals who exhibited trolling behaviors (ETB) and those who did not exhibit trolling behaviors (NETB). For comparisons of categorical variables, chi-square tests of independence were used. For comparisons of continuous variables, independent t-tests were used. A stepwise logistic regression model was developed to determine the key social media behaviors associated with trolling behaviors. Only variables significant at the univariate level were included in the model. To determine significance, two-tailed tests with an alpha level = 0.05 were used. All analyses were conducted using SPSS version 24.0 (Armonk, NY: IBM Corp).

IV. RESULTS

Five hundred and four (504) participants completed the survey assessing social media tendencies and several psychosocial factors. Of the participants, 414 were female (82.1 %), 86 were male (17.1%), and the remaining 4 participants (0.8%) identified as “other” or preferred not to answer. The participants’ mean age was 20.39 ($SD = 3.65$). Of the participants who reported their ethnicity, 285 (58.6%) were Caucasian, 55 (11.3%) were African American, and 146 (30.0%) were Latino/Hispanic.

Participants were placed into two comparison groups based on their reported trolling behaviors. Univariate comparisons were conducted to determine if participants who exhibit trolling behaviors (ETB) differ from those who do not exhibit trolling behaviors (NETB) on demographic factors, specific social media behaviors, and psychosocial factors.

Univariate Analyses

Demographic variables. Significant differences were found for gender and trolling behaviors, such as there was a higher percentage of males in the ETB group (29.7%) as compared to the NETB group (14.9%) ($\chi^2(4) = 12.337, p = .015$). There was no significant difference in age between the ETB and NETB groups. Additionally, distribution of race/ethnicity did not differ in the two groups (see Table 1).

Social media behaviors. Several specific social media behaviors varied significantly between the two comparison groups. When examining social media intensity, individuals in the ETB group ($M = 20.22, SD = 7.9$) used Twitter significantly more intensely than those in the NETB group ($M = 23.11, SD = 7.6$); $t(375) = -2.51, p = .011$. No significance differences were found between the ETB and NETB groups on

social media intensity for the other social media platforms examined (Facebook, Instagram, and Snapchat).

In measuring need for social media, a significance difference was found between the ETB ($M = 47.49$, $SD = 11.15$) and the NETB ($M = 43.65$, $SD = 10.86$) groups; $t(502) = -2.79$, $p = .005$. Individuals in the ETB group had significantly more need for social media.

In examining comparison to others, a significance difference was found between the ETB ($M = 2.59$, $SD = 1.26$) and NETB ($M = 2.1$, $SD = 1.01$) groups when comparing to others who are worse off; $t(502) = -3.71$, $p = .002$. Those who report exhibiting trolling behaviors were more likely to compare themselves to others who are worse off. There were no significant differences between the ETB or NETB groups for comparison to others who are better off.

Finally, a significance difference was found between the ETB ($M = 17.03$, $SD = 6.01$) and NETB ($M = 15.6$, $SD = 5.4$) groups when examining social media addiction; $t(501) = -2.08$, $p = .038$. Those who reported exhibiting trolling behaviors had higher levels of addiction to social media (see Table 2).

Psychosocial factors. Several psychosocial factors were assessed, including empathy, personality, and social support. In measuring empathy, there was a significant difference in the perspective taking subscale between the ETB ($M = 17.01$, $SD = 4.9$) and NETB ($M = 19.1$, $SD = 4.7$) groups; $t(490) = 3.39$, $p = .001$. Those who did not exhibit trolling behaviors were more likely to understand others' perspectives. There was also a significant difference for the empathic concern subscale between the ETB ($M = 18.2$, $SD = 5.1$) and the NETB ($M = 20.6$, $SD = 4.5$) groups; $t(491) = 4.00$, $p < .001$. This suggests

that individuals who did not exhibit trolling behaviors were more likely to express empathy towards others. No significant difference was found for the personal distress subscale between the two comparison groups.

In examining personality, two of the big five subscales showed a significant difference between the comparison groups. Agreeableness differed between the ETB ($M = 32.3$, $SD = 5.3$) and the NETB ($M = 34.7$, $SD = 5.2$) groups; $t(487) = 3.55$, $p < .001$. Individuals who did not exhibit trolling behaviors were more likely to be agreeable. There were also significant differences between the ETB ($M = 30.2$, $SD = 4.3$) and the NETB ($M = 31.7$, $SD = 5.3$) groups in relation to conscientiousness; $t(485) = 2.20$, $p = .029$, such that those who did not exhibit trolling behaviors had higher scores on the conscientiousness scale. No significant differences were found between the comparison groups for the other personality subscales (extraversion, neuroticism, and openness).

Finally, a significant difference was found for interpersonal support between the ETB ($M = 36.6$, $SD = 6.7$) and the NETB ($M = 38.8$, $SD = 6.8$) groups; $t(500) = 2.52$, $p = .012$. Individuals who exhibited trolling behaviors reported having significantly lower perceived social support (see Table 3).

Multivariate Analyses

The variables showing significant differences in means or proportions in comparison of the two trolling behavior groups at the univariate level were included in the multivariate analysis. A stepwise binary logistic regression analysis was conducted to determine which variables were most associated with exhibiting trolling behaviors. The overall model was significant ($X^2(4) = 25.802$, $p < .001$) with a Nagelkerke R Square = .134. The following factors were included: gender, social media intensity specifically for

Twitter, need for social media, downward comparison, social media addiction, the perspective taking and empathic concern subscales of the IRI, the agreeableness and conscientiousness personality factors, and interpersonal support.

In the comparison of exhibiting trolling behaviors, gender was found to be significant in that males were 2.637 times more likely to be classified in the ETB group ($B = .970, X^2 = 5.25, p = .019$). The need for social media also produced a significant association such that those with higher need for social media were more likely to exhibit trolling behaviors ($B = .037, X^2 = 4.081, p = .043$). Those with higher scores on making downward comparisons were more likely to be in the ETB group ($B = .446, X^2 = 8.07, p = .005$). Those who exhibit trolling behaviors are more likely to compare themselves to those who are worse off. Lastly, the perspective taking subscale of the IRI produced a significant negative association ($B = -.080, X^2 = 5.101, p = .024$), such that individuals who were less likely to take on another's perspective were more likely to be in the ETB group (see Table 4).

V. DISCUSSION

The present study was an exploratory examination of trolling behaviors on social media. Because there is limited research on the factors related to online trolling behaviors, many of the hypotheses developed for this study were based on prior research related to either bullying or cyberbullying. A few prior studies have shown that particular social media behaviors and psychosocial factors are associated with malicious online behaviors and cyberbullying, which are related to trolling (Ang & Goh, 2010; Nichol, 2012). The purpose of this study was to identify key demographics, social media behaviors, and psychosocial factors related to trolling behaviors on social media sites.

Basic demographic variables such as age, ethnicity, and gender were taken into consideration for this study. Age and ethnicity were not found to be significant predictors of trolling behaviors. A recent study examining cyberbullying behaviors over the lifespan identified a parabolic relationship showing that cyberbullying behaviors tended to increase throughout adolescence into young adulthood and then decrease (Barlett & Chamberlin, 2017). Since the current survey was administered to a population of college students, the age distribution was not very wide, which may explain why there was no significant difference in age detected between those who did and did not exhibit trolling behaviors in this sample.

It was found that participants who were male were more likely to exhibit trolling behaviors. This aligns with previous research showing that males are more likely to use social networking sites, such as Facebook, for antisocial purposes (Ferenczi, Marshall, & Benjanyan, 2017). Sun et al (2016) conducted a meta-analysis on gender differences in cyberbullying evaluating 39 empirical studies. While the authors stated that there were

many methodological issues to be considered in the analysis, there was a statistically significant gender difference observed, such that males were more likely to exhibit cyberbullying behaviors than females. The authors discussed reasons for these differences which included males being more likely to bully others in face-to-face situations and males having a higher tendency of playing more violent online games. Another factor that may influence the gender differences found in trolling behaviors is testosterone. Owelus and colleagues found that testosterone has a marked and direct causal effect on aggressive behaviors (1988). Although testosterone was only one of many potential factors, they found that high levels of the hormone affect the probability of initiating aggressive behavior (Owelus, Mattsoon, Schalling, & Low, 1988). This may help to explain why males were significantly more likely to exhibit trolling behaviors in the current study.

The Social Media Intensity Scale was examined for each of the four platforms: Facebook, Twitter, Instagram, and Snapchat to assess the extent to which social media use has become a major part of the participant's daily routine. When examining social media intensity, Twitter intensity was the only platform to be significantly associated with online trolling behaviors. Both Facebook and Twitter are structured to allow more written content, as compared to Instagram and Snapchat which focus more on images. It is likely that trolling behaviors are more associated with Twitter intensity because the Twitter platform is public, unlike Facebook.

The Need for Participating in Social Media scale assessed motivations related to social media use, and it was significantly associated with trolling behaviors. This supports Hypothesis I, which stated that high levels of trolling behaviors would be

associated with a greater need for social media. One possible explanation for this finding is that trolls or people who exhibit trolling behavior need to be entertained and exert power in some way. Social media sites are an outlet in which these needs can be met with anonymity and ease.

There was a significant finding between the groups associated with social comparisons, specifically comparing to others worse off. This supports Hypothesis II that high levels of trolling behavior would be associated with a greater downward comparison. Social comparison theory, postulated by Festinger (1954), states that humans develop self-evaluations by comparing themselves to others. This can be done through either upward comparisons, for which one compares him/herself to others better off than him/herself, or through downward comparisons, for which one compares him/herself to others they perceive to be worse off than themselves. Previous literature suggests that an upward comparison often leaves an individual with feelings of inadequacy, poorer self-evaluations, and experiences of negative affect (Marsh & Parker, 1984; Morse & Gergen, 1970; Pyszczynski, Greenberg, & LaPrelle, 1985). On the other hand, although downward comparisons can produce negative feelings as they reveal how things could be worse, they have actually been shown to lead to improvements in affect and self-evaluation (Wills, 1981). This may help explain why those who are identified as trolls are more likely to compare themselves to others worse off.

It was also found that social media addiction was a significant predictor of trolling behaviors. This supports Hypothesis III, which stated that higher levels of trolling behavior would be associated with greater social media addiction. In a meta-analysis done by Frost and Rickwood (2017), they conducted a systematic review of mental health

outcomes associated with Facebook use, including Facebook addiction. A cyclical relationship was found in that higher levels of general use led to an increased chance of Facebook addiction, and then the addiction led to more time spent online (Turel, 2015). Due to a troll's insatiable desires to initiate trouble online, it is logical that higher levels of trolling behaviors would be associated with social media addiction.

When examining psychosocial variables in relation to trolling behaviors some interesting results were produced. Lower scores on the Perspective-Taking subscale and on the Empathic Concern subscale of the Interpersonal Reactivity Index were both significantly associated with higher levels of trolling behaviors. This supports Hypothesis IV stating that high levels of trolling behavior would be associated with lower levels of perspective taking and empathic concern. While no studies to date have examined these empathic subscales against trolling behaviors, one study evaluated the relationship between trolling behaviors with cognitive and affective empathy and found a positive relationship between trolling and cognitive empathy, which suggests that trolls are aware of what their victims are experiencing (Sest & March, 2017). There are subtle differences between cognitive empathy and perspective-taking empathy, such that cognitive empathy focuses on the ability to recognize someone's emotional state, whereas with perspective-taking empathy, the individual views the situation from another's point of view. The findings from the current study show that individuals who exhibit trolling behaviors are less likely to be able to understand the situation from another's perspective.

Personality factors were also examined in relation to trolling behaviors. While there were no significant associations between extraversion, neuroticism, and openness with trolling behaviors, low levels of agreeableness and conscientiousness were

significantly associated with trolling behaviors. This supports Hypothesis V, which stated that high levels of trolling behaviors would be associated with lower levels of agreeableness and conscientiousness. These findings support those of Buckels, Trapnell, and Paulhus (2014) who also found that lower levels of agreeableness were exhibited in those identified as trolls. No research to date has found lower levels of conscientiousness to be associated with trolling behaviors. Bollmer and colleagues (2005) investigated a type of bully described as the dominant, imposing child who maliciously aggresses others. They found that this type of bully scored lower on both agreeableness and conscientiousness. With the ultimate goals of bullies and trolls being similar, previous bullying literature supports the findings in the current study.

Low interpersonal support was significantly associated with trolling behaviors. This supports Hypothesis VI which stated that high levels of trolling behaviors would be associated with lower perceived social support. This finding aligns with the literature in regards to other malicious online behaviors. As mentioned earlier in this study, Cho and Yoo found that high levels of perceived social support were negatively associated with cyberbullying (2017). In a study assessing characteristics of traditional bullies and cyberbullies, Kwak and Oh (2017) identified low social support to be a significant predictor of cyberbullying behaviors. To date, no studies have examined social support in relation to trolling behaviors. Previous literature has found that enacted social support, such as comments and ‘likes’, on Facebook contributed to increased life satisfaction (Zhang, 2017). Receiving positive feedback from Facebook friends has been shown to increase self-esteem and well-being (Steinfeld, Ellison, & Lampe, 2008; Valkenburg et

al., 2006). These findings could possibly explain the finding in the current study that low interpersonal support is associated with trolling behaviors.

A multivariate regression was developed to identify the key factors related to online trolling behaviors, with all of the predictors being assessed simultaneously. The final stepwise logistic regression found several variables to be significantly associated with trolling behaviors. Male gender was significantly associated with trolling behaviors. In regards to general social media behaviors, the need for social media and downward social comparisons were significantly associated with trolling behaviors. Those who exhibit trolling behaviors had a higher need for social media and they focused more on others who they perceived to be worse off than them. To the author's knowledge, this is the first study showing an association between these two social media behaviors and trolling behaviors. Although social media intensity and social media addiction produced significant results in initial analyses, neither were significant predictors of trolling behaviors in the final logistic regression model, which may be due to the overlap between social media intensity, addiction, and need. The perspective taking subscale of the empathy measure was the only psychosocial variable to be significantly associated with trolling behaviors in the multivariate analysis. Those who exhibited trolling behaviors were less likely to be able to see from others' perspectives. To the author's knowledge, this is the first study investigating this empathic subscale in relation to trolling behaviors indicating further research should be conducted.

Limitations

Although this study did advance the understanding of trolling behaviors by identifying demographic factors, social media behaviors, and psychosocial factors related

to trolling behaviors, there are limitations. One limitation is that the participants in the study were comprised of college students from mass communication and psychology courses at Texas State University. A sample pulled from a wider population may yield different results due to age, education, and experience. Another limitation is the sample was largely comprised of female participants. Results indicated that males were being significantly more likely to exhibit trolling behaviors, but a population more diverse in gender may yield different results. Another potential limitation is that data used for this study were collected via self-report measures. Participants may have been dishonest when taking the survey, thus possibly jeopardizing the validity of the study. Despite the limitations, the study aims to add to the research on trolling behaviors in order to gain a better understanding of malicious online behavior.

Conclusion

The purpose of this study was to gain a better understanding of trolling behaviors online. The findings in this study show that there are demographic factors, social media behaviors, and psychosocial factors related to trolling behaviors. Gaining a better understanding of this malicious online behavior may help to identify potential trolls and could lead to more prevention and intervention opportunities focused on reducing negative behaviors. Future research should focus more specifically on the behaviors that could lead to trolling, the effects of trolling on others, and the types of trolling occurring. The prevention of a behavior such as trolling could improve experiences online experiences and could prevent potential psychological issues. Overall, trolling is a new concept in which further research and understanding would be beneficial for the online population.

APPENDIX SECTION

Table 1. Demographics

	Trolling Behaviors	No Trolling Behaviors	Statistical Significance
Gender n(%)			
Males	22(29.7)	64(14.9)	p = .015
Females	51(68.9)	363(84.4)	
Age Mean (Std. Dev)	20.14(2.75)	20.43(3.78)	NS
Race/Ethnicity n(%)			
Caucasian	33(47.1)	252(60.6)	NS
African American	11(15.7)	44(10.6)	
Latino/Hispanic	26(37.1)	120(28.8)	

Table 2. Relationship between Trolling Behaviors and General Social Media Measures

	Trolling Behaviors N = 74	No Trolling Behaviors N = 430	Statistical Significance
Social Media Intensity			
Facebook	14.1 (7.1)	15.1 (6.0)	NS
Instagram	20.9 (6.7)	20.2 (6.7)	NS
Snapchat	23.5 (6.9)	22.4 (6.2)	NS
Twitter	23.1 (7.6)	20.2 (7.9)	p = .011
Need for Social Media	47.5 (10.9)	43.7 (10.9)	p = .005
Comparisons of Others...			
Better than me	2.89 (1.4)	2.79 (1.2)	NS
Worse than me	2.59 (1.3)	2.10 (1.0)	p = .002
Social Media Addiction	17.03 (6.1)	15.6 (5.4)	p = .038

Table 3. Relationship between Trolling Behaviors and Specific Psychosocial Factors

	Trolling Behaviors	No Trolling Behaviors	Statistical Significance
Empathy			
Perspective Taking	17.01 (4.9)	19.1 (4.7)	p = .001
Fantasy Scale	16.4 (4.7)	16.7 (5.4)	NS
Empathic Concern	18.2 (5.1)	20.6 (4.5)	p < .001
Personal Distress	10.0 (3.9)	9.8 (4.1)	NS
Big Five Personality			
Extraversion	26.1 (6.3)	25.4 (6.4)	NS
Agreeableness	32.3 (5.3)	34.7 (5.2)	p < .001
Conscientiousness	30.2 (4.3)	31.7 (5.3)	p = .029
Neuroticism	24.7(5.1)	25.3(5.2)	NS
Openness	35.3(6.0)	35.0(6.0)	NS
Interpersonal Support			
	36.6(6.7)	38.8(6.8)	p = .012

Table 4. Stepwise Binary Logistic Regression Analysis

	B	S.E.	Wald	Significance	Odds Ratio/95% CI
Gender: Male	.970	.413	5.525	.019	2.64 [1.18, 5.92]
Need for Social Media	.037	.018	4.081	.043	1.04 [1.001, 1.08]
Downward Comparison	.446	.157	8.065	.005	1.56 [1.15, 2.13]
Empathy: Perspective Taking Subscale	-.080	.035	5.101	.024	.92 [.86, .99]
Constant	-3.466	1.143	9.200	.002	

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