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Personality traits, personal motivations, and online news and social media commenting

Temple Northup, Arthur D. Santana, HoJoon Choi and Ratna Puspita

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Full Length Research Paper

Personality traits, personal motivations, and online news and social media commenting

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Among the most popular online platforms for commenting following a news story are Facebook, Twitter and on the news website itself. Using personality characteristics, including from the Big-Five schema (extraversion, neuroticism, openness to experience, agreeableness and conscientiousness) and the Dark Tetrad frame (Machiavellianism, psychopathy, narcissism and sadism), as well as personal motivations, the extent to which personality characteristics are predictors of news commenting behavior was determined, as well as the extent to which their personal motivations mediate and directly contribute to their behaviors. Based on a bi-national survey of 1,053 individuals, results suggest that extraversion, neuroticism, openness, conscientiousness, and Machiavellianism all predict online commenting. Further, motivations to comment seem to fall along two dimensions: Those who wish to discuss, and those who wish to provoke, with the discussion factor playing a larger role in commenting behavior, and mediating or partially-mediating the relationship between certain personality traits and commenting.

Key words: Social media, news, personality, motivation.

INTRODUCTION

Over 15 years after *Time Magazine* named “You” the Person of the Year, declaring that a new internet era of community and collaboration on a scale never before seen had arrived (Grossman, 2006), many of the computer-mediated technologies that helped facilitate that engagement have since become a normalized part of the media landscape.

Time’s assertion that the previously silent and anonymous masses were wresting power from the few and placing it into the hands of the many essentially

recognized the rise of the voices of the people who regularly contribute to blogs, wikis, photos, videos, comments, audio files, podcasts, and other forms of media—often made available through social networking sites (SNSs). On a total population basis (accounting for Americans who do not use the internet at all), 69% of all U.S. adults are Facebook users, while 40% use Instagram, 31% use Pinterest, 28% use LinkedIn and 23% use Twitter (Auxier and Anderson, 2021), statistics that have remained relatively steady in recent years

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(Greenwood et al., 2016).

Often included as a sub-category under the umbrella of such user-generated content (UGC) are news commenting forums, which allow newsreaders the opportunity to join an online conversation to discuss the news by positing a thought or responding to what others are saying. The rise of the forums in the past 15 years has largely mirrored the rise of SNS use: more than 90% of large U.S. daily newspapers accept online comments (Santana, 2014), 55% of Americans have left an online comment, and 78% have read the comments at some point (Stroud et al., 2015).

These computer-mediated technologies are the focus of this research. This research will augment the canon by attempting to better understand why some are more apt than others to post comments in reaction to news stories.

Specifically, the authors studied the extent to which major personality traits and motivations are associated with individuals' *news commenting* behavior, of which only tentative findings are available (Wu and Atkin, 2017). By casting a wide net in its examination of news commenting with these personality traits and motivations, this research adds new layers of knowledge to the existing body of work in this area.

LITERATURE REVIEW

Personality predictors for engaging social media

Scrutinizing personalities has been regarded as one of the most important topics in psychological research (Ozer and Benet-Martinez, 2006). Among the most popular research designs to test this idea is the five-factor, or Big Five, model of personalities. The model is concerned with the hierarchical organization of personality traits along five basic dimensions: extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (McCrae and John, 1992; Costa and McCrae, 1992), and individuals vary in terms on which they possess.

The model has been widely used to test personality predictors of social media use. For example, people who are *extraverted* are most apt to be gregarious, loquacious, and cheerful and thus naturally tend to use social networking sites as a tool to socialize (Seidman, 2013). This is often reflected in their more frequent use of Facebook (Gosling et al., 2011; Blackwell et al., 2017), greater number of Facebook friends (Acar, 2008; Amichai-Hamburger and Vinitzky, 2010; Kosinski et al., 2014) and preference for Facebook features, such as status updates (Ryan and Xenos, 2011). Based on this literature, it is predicted:

H1: There will be a positive relationship between commenting and extraversion.

Neuroticism is characterized by anxiety and sensitivity to threat. Neurotic individuals may use social media to seek a social support that may be missing from their lives offline (Ross et al., 2009). Accordingly, neuroticism is positively associated with frequency of social media use (Correa et al., 2010; Seidman, 2013), the use of Facebook for social purposes (Hughes et al., 2012), and engaging in emotional disclosure on Facebook (Seidman). However, although it makes sense that neurotic individuals would use social media more, their anxiety would probably make it less likely that they post comments to news stories, an act that seemingly would open them up to criticism. Therefore:

H2: There will be a negative relationship between commenting and neuroticism.

People who are high in *openness* tend to be creative, intellectual, and curious. Openness is positively associated with using Facebook for finding and disseminating information (Hughes et al., 2012). People high in openness were more likely to update others about intellectual topics, consistent with their use of Facebook for sharing information (Marshall et al., 2015). Overall, openness has been shown to be a significant predictor of social networking site use (Correa et al., 2010; Ross et al., 2009). Therefore, it would be predicted that:

H3: There will be a positive relationship between commenting and openness.

People who are high in *agreeableness* tend to be cooperative, helpful, and interpersonally successful. Agreeableness is positively associated with posting on Facebook to communicate and connect with others and negatively associated with posting to seek attention (Seidman, 2013) or to criticize others (Stoughton et al., 2013). The interpersonal focus of agreeable people and their use of Facebook for communication inspire more frequent updates about their social activities and relationships (Marshall et al., 2015). It is also expected that the social nature of commenting online would lead individuals to post more comments to news stories:

H4: There will be a positive relationship between commenting and agreeableness.

Conscientiousness describes people who are organized, responsible, and hard-working. They tend to be more cautious in managing their social media profiles and thus use Facebook less frequently (Gosling et al., 2011). But when they do use it, conscientious individuals are diligent and discreet; they have more Facebook friends (Amichai-Hamburger and Vinitzky, 2010), they avoid criticizing people (Stoughton et al., 2013), and they are less likely to post on Facebook to seek attention or acceptance (Seidman, 2013). As these individuals would tend to be

more cautious, we expect:

H5: There will be a negative relationship between commenting and conscientiousness.

As Ross et al. (2009) maintain that researchers should not limit themselves to studying those personality traits derived only from the Big Five schema. This research thus casts a wider net to include four other personality traits: narcissism, psychopathy, Machiavellianism and sadism, part of the so-called Dark Tetrad of personality traits (Kircaburun et al., 2018). These traits are far less studied, especially in relation to social media use, and therefore are important to consider building a broader understanding of online behaviors.

Narcissistic individuals tend to be self-aggrandizing, vain, exhibitionistic and possess by an inflated sense of self, a sense of uniqueness and entitlement (Raskin and Terry, 1988). They seek attention and admiration by boasting about their accomplishments (Buss and Chiodo, 1991) and take particular care of their physical appearance (Vazire et al., 2008). This suggests that their status updates will more frequently reference their achievements and appearance (Marshall et al., 2015). Moreover, the choice of these topics may be motivated by the use of status updates to gain validation for inflated self-views, consistent with the positive association of narcissism with the frequency of posting status updates and photos of oneself (Carpenter, 2012), posting more self-promoting content (Mehdizadeh, 2010), and seeking to attract admiring friends (Davenport et al., 2014). Therefore, the authors predict:

H6: There will be a positive relationship between commenting and narcissism.

Also considered part of this “dark” personality cluster (Paulhus and Williams, 2002), *psychopathy* is generally understood to refer to a lack of empathy and anxiety, interpersonal manipulation, antisocial behavior, and high impulsivity (Hare and Neumann, 2008). It has been referred to as a pattern of callous, remorseless manipulation and exploitation of others and has been investigated as a psychological cause of antisocial and criminal behavior (Hare, 1991). It was therefore predicted that:

H7: There will be a positive relationship between commenting and psychopathy.

Machiavellianism reflects cold, strategic manipulation and deception in interpersonal interactions, selfishness, instrumentality, cynicism and pragmatic morality (Christie and Geis, 1970). Someone with Machiavellian traits would view other people as mere tools, or a means to an end (Matt, 2017). It has been studied in social psychology investigations involving persuasion, leadership, and unethical behaviors (Lee and Ashton, 2005). In the context of online commenting, it was predicted that:

H8: There will be a positive relationship between commenting and Machiavellianism.

Finally, the argument has been made that *sadism* should be added to the mix (Buckels et al., 2013; Kircaburun et al., 2018) in order to better understand deviant behavior. Sadism is generally understood to be unique from the other “dark” personality traits inasmuch as it is marked by deriving pleasure from inflicting pain, suffering and humiliation on others.

Given that many comments online tend to put down others or their beliefs, we would predict:

H9: There will be a positive relationship between commenting and sadism.

Motivations to comment online

Although it is predicted that personality traits will predict commenting behavior, it was also conceptualized that this relationship could be mediated and uniquely predicted by specific and individual motivations to comment. One of the core assumptions of a new Web 2.0 framework in the mass communication field is the concept of an active audience, one that no longer idly consumes information but rather engages via participation, including with the creation of personalized content or comments. Deemphasizing the role of the sender and instead stressing an active Internet user, one driven by psychological motivations, research has focused on capturing the purposiveness of media consumption.

Those who utilize the two-way interactivity of the Internet are now seen as “users” and their use-habits have been found to fulfill some intrinsic need. The uses and gratifications (U and G) model was thus borne out of the perspective that shifted the focus of media effects from what media do to people to what people do with media, and the theory has been tested and refined in the Internet era (Sundar and Limperos, 2013).

In trying to explain the uses and functions of the media for individuals, groups and society, the theory attempts to explain how individuals use the mass media to “gratify” their needs, including outlining their motivations. Frequently identified in the U and G literature as a driver of user-generated content creation on Internet-based new media platforms have been self-expression gratifications (Kaye and Johnson, 2002; Leung, 2013). Conceptualized broadly, self-expression gratifications refer to gratifications acquired through expression of one’s beliefs, thoughts, opinions or other information about one’s self (Leung, 2013). Commenting on news stories would fall under these self-expressions.

Till date, there has been no research that has examined both the personality traits and motivations to comment online together as predictors of who ultimately comments online. The author suggests that motivations to comment are associated with and derived from the more stable

personality traits, and therefore there will be a relationship between the traits and motivations. Further, because the motivations are associated with the traits, we posit that they will mediate the relationship between the personality traits and the actual behavior. Therefore, the following research questions are posed:

RQ1: To what extent will personality traits predict different motivations to comment online?

RQ2: To what extent will motivations mediate the relationship between personality traits and commenting online?

METHODS

In order to test these hypotheses and explore the research questions, a national, representative survey was conducted in both the United States (U.S.) and Indonesia using Qualtrics to provide the sample. In total, 1,053 participated in the survey, with an average age of 42.23 ($SD = 15.99$) and the gender breakdown being nearly identical (526 female, 527 male).

The U.S. sample included 527 people, with an average age of 52.19 ($SD = 15.47$) and an equal gender representation (263 female, 264 male). There was some variation among race, with 79.7% White ($n = 420$), 12.9% African American ($n = 68$), 3% Asian ($n = 16$), and the rest indicating "other" or "multiracial" ($n = 23$). For educational levels, 7.2% reported having less than a high school education ($n = 38$), 31.9% reported a high school education ($n = 168$), 25.6% had some college ($n = 135$), 11.6% reported an Associate's Degree ($n = 61$), 15.9% had a college degree ($n = 84$), 6.5% a Masters ($n = 34$), and 1.3% a doctorate ($n = 7$).

The Indonesian sample was 526 individuals, with an average age of 32.15 ($SD = 8.36$). There were equal numbers of males and females ($n=263$ each). For educational levels, .4% reported having less than a high school education ($n = 2$), 1.3% reported a high school education ($n = 7$), 27.6% had some college ($n = 145$), 10.6% reported an Associate's Degree ($n = 56$), 54.4% had a college degree ($n = 286$), 4.8% a Masters ($n = 25$), and 1% a doctorate ($n = 5$).

Independent variables

Big Five Inventory (BFI)

The BFI was measured using the scale items developed by John et al. (1991, 2008). In total, there were 44 questions that measured the extent to which different characteristics applied or did not apply to each participant. Measured traits included Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness.

All Cronbach's alphas suggest that the scale items were reliable (Extraversion $\alpha = 0.786$; Agreeableness $\alpha = 0.774$; Conscientiousness $\alpha = 0.823$; Neuroticism $\alpha = 0.856$; Openness $\alpha = 0.786$). The scales range from 1 (=not possessing trait) to 5 (=strongly possessing the trait). The means and standard deviations for the variables were as follows: Extraversion, $M = 3.31$ ($SD = 0.74$); Agreeableness, $M = 4.01$ ($SD = 0.74$); Conscientiousness, $M = 3.91$ ($SD = 0.66$); Neuroticism, $M = 2.63$ ($SD = 0.85$); and Openness, $M = 3.74$ ($SD = 0.64$).

The dark tetrad

To examine these traits, scales developed by Jones and Paulhus

(2013) and O'Meara et al. (2011) were used. Measured traits included Machiavellianism, Narcissism, Psychopathy, and Sadistic Impulses. All Cronbach's alphas suggest that the scale items were reliable (Machiavellianism $\alpha = 0.770$; Narcissism $\alpha = 0.774$; Psychopathy $\alpha = 0.802$; Sadism $\alpha = 0.898$). The scales range from 1 (=not possessing trait) to 5 (=strongly possessing the trait). The means and standard deviations for the variables were as follows: Machiavellianism, $M = 3.14$ ($SD = 0.73$); Narcissism, $M = 2.17$ ($SD = 1.09$); Psychopathy, $M = 2.10$ ($SD = 0.78$); and Sadistic Impulses, $M = 1.61$ ($SD = 0.79$).

Mediating variables

Motivations to comment online

To measure individual's specific motivations for commenting online, a series of statements were developed. Their intention was to capture a wide spectrum of reasons that one might consider when commenting online, particularly based on individual's various aspects of self-expression gratification motivations (Sundar and Limperos, 2013; Kaye and Johnson, 2002; Leung, 2013). Table 1 lists the statements to which they agreed or disagreed with in relation to commenting on news stories online.

Employing a whole sample data set, an exploratory factor analysis was conducted to confirm whether all the mediating variables had clearly separable dimensions among the respondents. The factor analysis used Varimax rotation, and the results successfully identified two distinctive factors. As shown in Table 1, the first factor accounted for 51.05% of the variance with high level of internal consistency ($\alpha = 0.94$), and the factor loading values were between 0.62 and 0.87.

Items in the first factor included the motivations of: representing one's view, expressing one's thoughts, giving one's own perspective, agreeing with someone else's opinion, adding to the discussion, praising other comments, interacting with the community, correcting errors, disagreeing with someone's opinion, and adding context. Since these items primarily related to statements related to wanting to add to conversations or interact with others constructively online, we conceptualized the first factor as "Discussion." In contrast, the second factor accounted for 15.03% of the variance.

Items in the second factor had 0.73 to 0.87 factor loading values with high level of internal consistency ($\alpha = 0.90$). The second factor was conceptualized as "Provocation" the statements were less about adding information as they were about taking a specific and negative approach (e.g., to "be offensive"). Thus, these two factors represent what we found to be the two primary motivations related to why individuals were commenting on online news stories or posts.

Dependent variables

The primary dependent variable in this research was the frequency with which participants commented online to news articles. Three separate measures were used to evaluate this depending on the location of where the commenting occurred. Specifically, we analyzed commenting that occurred: on a Facebook post of a news article; on a Twitter post of a news article; and directly on a news website.

Frequency of Facebook commenting

To measure this, three items were developed asking how frequently each participant commented on a news article on Facebook (frequency of commenting on a news organization's post, a friend's

Table 1. Factor analysis of motivations to comment online.

Factor labels	Variable	Factor loadings	Eigen-value	Percent of variance (%)
Discuss factor	Represent my view	0.872	8.168	51.05
	Express my thoughts	0.862		
	Give my perspective	0.858		
	Agree with someone else	0.819		
	Add to the discussion	0.803		
	Praise other commenters	0.791		
	Interact with a community	0.75		
	Correct an error in a story	0.665		
	Disagree with someone else	0.665		
Provoke factor	Add context to the story	0.623	2.404	15.03
	Be deliberately provocative	0.872		
	Be deliberately offensive	0.867		
	Demonstrate I am smarter than someone else	0.842		
	Give my ego a boost	0.786		
	Get a reaction from another	0.732		

Source: Author's Calculations

post, or the post of someone they do not know). These three items had good reliability, $\alpha = 0.907$, with lower scores representing commenting less frequency ($M = 2.96$, $SD = 1.67$).

Frequency of Twitter commenting

To measure this, three similar items were developed asking how frequently each participant commented on a news article on Twitter (frequency of commenting on a news organization's Tweet, a friend's Tweet or the Tweet of someone they do not know). These three items had good reliability, $\alpha = 0.969$, with lower scores representing commenting less frequency ($M = 2.89$, $SD = 1.96$).

Frequency of News Website commenting

To measure this, a single item was used asking the frequency with which each participant would comment on a story directly on a news website, $M = 2.82$, $SD = 1.80$.

RESULTS

To test the proposed hypotheses, this research needed to estimate the predictive effects of respondents' diverse personality traits on their frequency of online news commenting. Furthermore, to answer the research questions, it needed to examine the predictive effects of respondents' personality traits on their Discussion and Provocation motivations to comment online, and whether the motivations mediated the relationship between personality traits and frequency of online news commenting.

First, for hypotheses testing, a set of multiple linear regression analyses were conducted across the

dependent variables. As shown in Table 2, the results showed that the influences of Extraversion, Openness, and Machiavellianism were positive and significant on all the dependent variables ($p < 0.05$), while Sadism only positively predicted the frequency of Twitter commenting at significant levels ($\beta = 0.206$, $t(1012) = 2.247$, $p < 0.05$). In contrast, the predictive effects of Conscientiousness and Narcissism were significant on all the dependent variables ($p < 0.01$), but all of their influences were in negative direction. Meanwhile, the results indicated that Agreeableness, Neuroticism, and Psychopathy did not make any significant influences on the dependent variables ($p > 0.05$). Thus, H1 (extraversion), H2 (neuroticism), H3 (openness), H5 (conscientiousness), and H8 (Machiavellianism) were fully supported, with H9 (sadism) being partially supported. However, H4 (agreeableness), H6 (narcissism), and H7 (psychopathy) were not supported.

In addition to the hypotheses testing, the predictive effects of these personality traits on discussion and provocation motivations were also examined to test RQ1. Table 3 presents the predictive effects of the independent variables on each of the motivational factors. Discussion factor was significantly and positively predicted by Extraversion, Agreeableness, Openness, and Machiavellianism ($p < 0.01$), while the factor was negatively predicted by Conscientiousness, Narcissism, and Psychopathy at significant level ($p < 0.05$). For provocation factor, it was positively predicted by Extraversion, Openness, Machiavellianism, Psychopathy, and Sadism at significant level ($p < 0.05$), whereas the factor was negatively predicted by Conscientiousness, Neuroticism, and Narcissism at significant level ($p < 0.01$).

Table 2. The effect of personality traits on frequency of commenting.

Independent variable	DV: Frequency of news website commenting		DV: Frequency of Facebook commenting		DV: Frequency of Twitter commenting	
	Beta	t (1012)	Beta	t (1012)	Beta	t (1012)
Extraversion	0.429	5.573***	0.399	4.695***	0.480	5.402**
Agreeableness	0.024	0.222	-0.049	-0.412	0.121	0.971
Conscientiousness	-0.397	-4.053***	-0.344	-3.180**	-0.476	-4.207***
Neuroticism	0.013	0.179	0.079	0.990	-0.068	-0.810
Openness	0.392	4.674***	0.253	2.727**	0.520	5.364***
Machiavellianism	0.344	4.484***	0.187	2.209*	0.536	6.042***
Narcissism	-0.731	-17.142***	-0.549	-11.642***	-0.941	-19.091***
Psychopathy	0.005	0.052	0.019	0.178	0.001	0.010
Sadism	0.148	1.868	0.095	1.083	0.206	2.247*
R-square		0.295		0.168		0.342

***p < .001, **p < .01, *p < .05, #p < .10.

Source: Author's Calculations

Table 3. The effect of personality traits on motivations to online comment.

Independent variable	MV: Discussion factor		MV: Provocation factor	
	Beta	t (1012)	Beta	t (1012)
Extraversion	0.321	7.177***	0.103	2.488*
Agreeableness	0.231	3.686***	0.019	0.334
Conscientiousness	-0.166	-2.918**	-0.165	-3.152**
Neuroticism	0.062	1.475	-0.111	-2.852**
Openness	0.448	9.185***	0.116	2.572*
Machiavellianism	0.345	7.730***	0.208	5.057***
Narcissism	-0.356	-14.337***	-0.072	-3.155**
Psychopathy	-0.135	-2.451*	0.360	7.110***
Sadism	-0.036	-0.774	0.426	10.020***
R-square		0.365		0.461

***p < .001, **p < .01, *p < .05, #p < .10.

Source: Author's Calculations

Furthermore, to test RQ2, the authors examined to what extent Discussion and Provocation motivations mediate the relationship between personality traits and frequencies of commenting online. Employing Hayes' (2013) Process macro, a series of mediation analyses was conducted (model 4) to estimate the direct and indirect effects of independent and mediating variables on dependent variables. First, when independent and mediating variables were inserted into the regression models together (Table 4), the positive direct effects of Extraversion and the negative direct effects of Conscientiousness and Narcissism were still significant across all dependent variables ($p < 0.05$), while the positive effects of Openness and Machiavellianism were significant on frequency of news website commenting ($p < 0.05$) and frequency of Twitter commenting ($p < 0.01$). Sadism had a significantly positive direct effect on frequency of news website commenting only ($p < 0.05$).

Second, a series of mediation analyses were conducted to test the indirect effects of these independent variables on dependent variables (Table 5 to 7). As the results, discussion factor partially mediated the positive effect of extraversion on all three dependent variables (for frequency of news website commenting: effect = 0.137, $CI_{LL-UL} = 0.087$ to 0.194 ; for frequency of Facebook commenting: effect = 0.128, $CI_{LL-UL} = 0.077$ to 0.185 ; for frequency of Twitter commenting: effect = 0.154, $CI_{LL-UL} = 0.099$ to 0.219). Similarly, discussion factor partially mediated the negative effect of conscientiousness on the dependent variables (for frequency of news website commenting: effect = -0.071, $CI_{LL-UL} = -0.123$ to -0.023 ; for frequency of Facebook commenting: effect = -0.066, $CI_{LL-UL} = -0.117$ to -0.022 ; for frequency of Twitter commenting: effect = -0.079, $CI_{LL-UL} = -0.136$ to -0.029), and the negative effect of Narcissism on the dependent variables (for frequency of news website commenting:

Table 4. The mediation effect of motivations to comment between personality traits and frequency of commenting.

Predictor	Mediators and dependent variable					
	DV: Frequency of news website commenting		DV: Frequency of Facebook commenting		DV: Frequency of Twitter commenting	
	Beta	t (1012)	Beta	t (1012)	Beta	t (1012)
Extraversion	0.292	3.806***	0.285	3.338**	0.315	3.541***
Agreeableness	-0.074	-0.707	-0.139	-1.186	0.008	0.068
Conscientiousness	-0.327	-0.407**	-0.3	-2.819**	-0.377	-3.402**
Neuroticism	-0.014	-0.196	0.039	0.005	-0.085	-1.039
Openness	0.202	2.369*	0.090	0.948	0.293	2.969**
Machiavellianism	0.198	2.545*	0.078	0.904	0.347	3.855***
Narcissism	-0.580	-12.679***	-0.417	-8.197***	-0.762	-14.405***
Psychopathy	0.064	0.676	0.122	1.165	0.024	0.224
Sadism	0.165	2.045*	0.168	1.871#	0.174	1.869
Discussion Factor	0.426	8.09***	0.399	6.829***	0.478	7.851***
Provocation Factor	-0.004	-0.062	-0.137	-2.163*	0.114	1.727#

***p < .001, **p < .01, *p < .05, #p < .10.

Source: Author's Calculations

Table 5. Mediation analyses – DV: Frequency of news Website commenting.

Indirect effect of IV on DV	Mediator	Effect	BootSE	LLCI	ULCI	Note
Extraversion → Frequency of commenting	Discuss factor	0.137	0.027	0.087	0.194	Partial mediation
	Provoke factor	0.000	0.006	-0.014	0.011	No mediation
Agreeableness → Frequency of commenting	Discuss factor	0.098	0.030	0.043	0.159	Indirect effect only
	Provoke factor	0.000	0.003	-0.007	0.007	No mediation
Conscientiousness → Frequency of commenting	Discuss factor	-0.071	0.026	-0.123	-0.023	Partial mediation
	Provoke factor	0.001	0.009	-0.018	0.021	No mediation
Neuroticism → Frequency of commenting	Discuss factor	0.026	0.020	-0.014	0.067	No mediation
	Provoke factor	0.000	0.007	-0.014	0.014	No mediation
Openness → Frequency of commenting	Discuss factor	0.191	0.035	0.127	0.262	Partial mediation
	Provoke factor	0.000	0.007	-0.014	0.013	No mediation
Machiavellianism → Frequency of commenting	Discuss factor	0.147	0.029	0.093	0.206	Partial mediation
	Provoke factor	-0.001	0.012	-0.026	0.022	No mediation
Narcissism → Frequency of commenting	Discuss factor	-0.151	0.021	-0.195	-0.109	Partial mediation
	Provoke factor	0.000	0.004	-0.008	0.008	No mediation
Psychopathy → Frequency of commenting	Discuss factor	-0.057	0.025	-0.109	-0.012	Indirect effect only
	Provoke factor	-0.001	0.020	-0.040	0.039	No mediation
Sadism → Frequency of commenting	Discuss factor	-0.015	0.020	-0.056	0.023	No mediation
	Provoke factor	-0.002	0.023	-0.050	0.043	No mediation

Source: Author's Calculations

effect = -0.151, $CI_{LL-UL} = -0.195$ to -0.109 ; for frequency of Facebook commenting: effect = -0.141, $CI_{LL-UL} = -0.189$ to -0.097 ; for frequency of Twitter commenting: effect = -0.170, $CI_{LL-UL} = -0.220$ to -0.125). Discussion factor also partially mediated the positive effect of Openness on frequency of news website commenting (effect = 0.191, $CI_{LL-UL} = 0.127$ to 0.262) and frequency of Twitter commenting (effect = 0.214, $CI_{LL-UL} = 0.142$ to 0.293), and

the positive effect of Machiavellianism on frequency of news website commenting (effect = 0.191, $CI_{LL-UL} = 0.127$ to 0.262) and frequency of Twitter commenting (effect = 0.214, $CI_{LL-UL} = 0.142$ to 0.293).

Interestingly, the direct effects of Openness and Machiavellianism on frequency of Facebook commenting were not significant with the mediating factors ($p > 0.05$; Table 4), while these independent variables made

Table 6. Mediation analyses – dv: Frequency of Facebook commenting.

Indirect Effect of IV on DV	Mediator	Effect	BootSE	LLCI	ULCI	Note
Extraversion → Frequency of commenting	Discuss factor	0.128	0.028	0.077	0.185	Partial mediation
	Provoke factor	-0.014	0.009	-0.036	0.000	No mediation
Agreeableness → Frequency of commenting	Discuss factor	0.092	0.029	0.039	0.149	Indirect effect only
	Provoke factor	-0.003	0.009	-0.024	0.014	No mediation
Conscientiousness → Frequency of commenting	Discuss factor	-0.066	0.024	-0.117	-0.022	Partial mediation
	Provoke factor	0.023	0.013	0.003	0.052	Partial mediation
Neuroticism → Frequency of commenting	Discuss factor	0.025	0.020	-0.013	0.065	No mediation
	Provoke factor	0.015	0.008	0.001	0.034	Indirect effect only
Openness → Frequency of commenting	Discuss factor	0.179	0.035	0.114	0.252	Full mediation
	Provoke factor	-0.016	0.009	-0.037	-0.001	Full mediation
Machiavellianism → Frequency of commenting	Discuss factor	0.138	0.029	0.084	0.197	Full mediation
	Provoke factor	-0.029	0.014	-0.060	-0.004	Full mediation
Narcissism → Frequency of commenting	Discuss factor	-0.142	0.023	-0.189	-0.097	Partial mediation
	Provoke factor	0.010	0.006	0.001	0.022	Partial mediation
Psychopathy → Frequency of commenting	Discuss factor	-0.054	0.024	-0.106	-0.010	Indirect effect only
	Provoke factor	-0.049	0.023	-0.097	-0.007	Indirect effect only
Sadism → Frequency of commenting	Discuss factor	-0.014	0.018	-0.052	0.020	No mediation
	Provoke factor	-0.058	0.028	-0.118	-0.008	Indirect effect only

Source: Author's Calculations

Table 7. Mediation analyses – DV: Frequency of Twitter commenting.

Indirect effect of IV on DV	Mediator	Effect	BootSE	LLCI	ULCI	Note
Extraversion → Frequency of commenting	Discuss factor	0.154	0.030	0.099	0.219	Partial mediation
	Provoke factor	0.012	0.008	-0.002	0.031	No mediation
Agreeableness → Frequency of commenting	Discuss factor	0.110	0.034	0.046	0.180	Indirect effect only
	Provoke factor	0.002	0.008	-0.014	0.020	No mediation
Conscientiousness → Frequency of commenting	Discuss factor	-0.079	0.028	-0.136	-0.029	Partial mediation
	Provoke factor	-0.019	0.013	-0.047	0.003	No mediation
Neuroticism → Frequency of commenting	Discuss factor	0.030	0.023	-0.015	0.075	No mediation
	Provoke factor	-0.013	0.009	-0.033	0.001	No mediation
Openness → Frequency of commenting	Discuss factor	0.214	0.038	0.142	0.293	Partial mediation
	Provoke factor	0.013	0.010	-0.002	0.036	No mediation
Machiavellianism → Frequency of commenting	Discuss factor	0.165	0.032	0.106	0.232	Partial mediation
	Provoke factor	0.024	0.015	-0.004	0.054	No mediation
Narcissism → Frequency of commenting	Discuss factor	-0.170	0.024	-0.220	-0.125	Partial mediation
	Provoke factor	-0.008	0.006	-0.021	0.001	No mediation
Psychopathy → Frequency of commenting	Discuss factor	-0.064	0.028	-0.125	-0.014	Indirect effect only
	Provoke factor	0.041	0.026	-0.007	0.093	No mediation
Sadism → Frequency of commenting	Discuss factor	-0.017	0.022	-0.060	0.025	No mediation
	Provoke factor	0.049	0.029	-0.008	0.106	No mediation

Source: Author's Calculations

positive indirect effects on the dependent variable (Table 6), so the discussion factor fully mediated the predicting relationships (Baron and Kenny, 1986).

In contrast, the partial and full mediating effects of

Provocation factor were observed only in frequency of Facebook commenting because the factor showed significant direct effect only on the dependent variable ($p > 0.05$; Table 4). As shown in Table 6, Provocation

factor partially and positively mediated the effects of Conscientiousness (effect = 0.023, CI_{LL-UL} = 0.003 to 0.052) and Narcissism (effect = 0.010, CI_{LL-UL} = 0.001 to 0.052), and fully and negatively mediated the effects of Openness (effect = -0.016, CI_{LL-UL} = -0.037 to -0.002) and Machiavellianism (effect = -0.029, CI_{LL-UL} = -0.006 to -0.004).

Other than the partial and full mediating effects of the two mediating factors, mediation analyses also revealed several “indirect-only” effects, which show significant mediations but no direct prediction from the independent variable (Tables 2, 5, 6, and 7). Particularly for the frequency of Facebook commenting, Provocation factor showed several indirect-only effects mediating the positive influence from Neuroticism (effect = 0.015, CI_{LL-UL} = .001 to 0.034), and mediating the negative influences from Psychopathy (effect = -0.054, CI_{LL-UL} = -0.106 to -0.010) and Sadism (effect = -0.058, CI_{LL-UL} = -0.118 to -0.008) (Table 6). The indirect-only effects were also observed in Discussion Factor, particularly mediating the positive influence of Agreeableness and also mediating the negative influence of Psychopathy on all the dependent variables.

In sum, for one or more dependent variables, Discussion factor fully, partially, or indirectly mediated the positive effects of Extraversion, Agreeableness, Openness, and Machiavellianism, and also mediated the negative effects of Conscientiousness, Narcissism, and Psychopathy. Whereas, Provocation factor indirectly or partially mediated the positive effects of Conscientiousness, Neuroticism and Narcissism, and fully or indirectly mediated the negative effects of Openness, Machiavellianism, Psychopathy, and Sadism on frequency of Facebook commenting only. Additionally, across all the set of regression analyses, the possibility of multi-collinearity was very low because all the independent variables’ variance-inflation factors (VIFs) were less than 3 while their tolerance values were higher than 1 (Hair et al., 2009). Outliers were not detected in the analyses, either (Mahalanobis, 1936).

DISCUSSION

This research builds on the work of others who examined the intersection of personality traits and news commenting (Wu and Atkin, 2017). Such inquiry of news commenting on social media is meaningful as a number of regional and large news outlets—in responses to concerns over discussion quality—now require commenters to log in via their Facebook or other accounts (Santana, 2014). Moreover, there exists only a small body of research on the personality traits associated with news content creation. Understanding how differing personality characteristics affect the commenting behavior of users is important because it sheds new light on how news commenters have multi-

varied and diverse motivations. This research expands on previous findings by adding four more personality characteristics found in the Dark Tetrad of personality traits and by considering individual motivations to comment as possible mediators to the relationships between personality and commenting behaviors.

Considering first the Big Five personality traits, Extraversion and Openness were strong and significantly positive predictors of online news commenting, as hypothesized. Also as predicted, Conscientiousness was a significantly negative predictor. Within the schema of personalities, these results make conceptual sense. People who are extraverted get a sense of pleasure by interacting with others; these results suggest that the interaction carries forward into posting comments to online news stories. Those who are prone to openness, which includes those who are more intellectual and curious, also would post more because they presumably derive pleasure by those online interactions with others who are thinking critically about the news stories they are reading. Conversely, those who are conscientious tend to be a bit more cautious, which in this context means that they are less likely to comment perhaps because they do not want to open themselves up to being wrong or seen as being rude.

Agreeableness and Neuroticism were not found to be significant predictors; however, the lack of relationship actually makes conceptual sense. For those who are agreeable, they have a strong desire to get along with others and avoid being in conflict. Posting a reaction to a news story opens one up to some possibilities of conflict, as the vast majority of the time people comment to add their own views or opinions about the story. Those who are wishing to avoid confrontation may avoid posting in general on news stories. Similarly, those who are neurotic and have anxiety may similarly wish not to post information that opens themselves up to being judged. Thus, although we predicted a relationship for both of those variables, the lack of significance itself is interesting and suggests that individuals with those personality traits may avoid sharing their opinions related to news stories.

Among the Dark Tetrad, in line with predictions, Machiavellianism was a strong and positive predictor of online news commenting, as was Sadism but only for those commenting on Twitter. For many, those results are probably not surprising. Those who score high in Machiavellianism tend to be strategic, cold, and manipulative—commenting online may allow them the opportunity to be all of those things. Similarly, those who score high in Sadism enjoy humiliating others. The fact that this trait was only associated with commenting on Twitter, a space that perhaps allows more anonymity than something like Facebook, would make sense as it is a space where you can freely mock others.

Contrary to expectations, there was a negative relationship between Narcissism and commenting online.

As a possible explanation, the characteristics of this trait are to inflate one's self-achievement, which perhaps do not fit with general engagement of discussions online. In fact, a motivation to gain validation from friends could discourage one's participation in discussions around news events.

Considering next the different motivations to comment online, respondents' motivations were categorized along two dimensions: Discussion and Provocation. Whereas the "Discussion" dimension primarily related to the desire to participate in an online discussion around a news article, the "Provocation" dimension related more specifically to trying to get a reaction from others. Of the two dimensions, the results suggest that the desire to engage in discussion is the stronger motivation.

For the discussion factor, Extraversion, Agreeableness, Openness, and Machiavellianism all were significant and positive predictors; conversely, Conscientiousness, Narcissism, and Psychopathy were all significant and negative predictors. Recognizing that this first motivational dimension revolves around those who wish to in some way engage with others about what is being read, these relationships all make sense. Those who are more outgoing, intellectual, and even calculating are more motivated to engage with others online; those who are more self-aware and nervous would avoid those behaviors. It is perhaps not surprising, then, that the influence of the different personality traits tends to be direct, or partially indirect, on the commenting variables through the Discussion motivation.

Many of the same traits have a similar relationship with the Provocation factor, with the addition of Sadism as a positive and significant predictor. The idea that those who have more tendencies to humiliate others and comment in a provocative way online is not surprising, and fits with what one would generally expect to find.

Taken together, these results provide more depth and context to understanding who is commenting online and what their motivations may be. The fact that two dominant motivations to commenting online was found — Discussion and Provocation—perhaps would surprise nobody who reads comments online, as they do tend to fall into those two broad categories. However, from this analysis, the good news for news organizations is that the Discussion factor provided much more explanatory power. In other words, although there are those who comment online just to be provocative or confrontational, commenters are more motivated to actually add to the discussion than they are just to cause trouble. This suggests that comments on news stories actually could add value to the story, rather than just devolving into nasty debates.

It is also important to recognize that the personality traits that tended to predict online news commenting were largely positive. Two of the most consistent traits to predict commenting across platforms were extraversion and openness—both of which suggest that a lot of the commenting does revolve around a desire to connect

with and learn from others.

This is not to say that negative traits do not also play a factor, as particularly those who score high on Machiavellianism tend to comment more, but to say that the value of online news comments and interactions may be more than what is generally thought.

Conclusion

As with any study, limitations should be recognized. In particular, the sample comprised of participants recruited by Qualtrics. Although they are a reputable company that uses its vast network to find participants, its participants does not always exactly match the demographics of the population (for example, Boas et al., 2018). Nevertheless, the limitation is tempered by the fact that this research examined underlying psychological motivations, which should be less sample dependent than political orientation, and that we drew as diverse and large of a sample as we could. Still, future research should be conducted to replicate and build upon these results using other samples.

As noted above, the results suggest that users are primarily motivated by wanting to discuss rather than provoke. Future endeavors could build upon this by doing more research into examining commenting behaviors by type of story. In other words, it could be possible that individuals are motivated to discuss when the topic is non-controversial, but more likely to provoke when the topic is one that is by nature sensitive (e.g., politics).

Despite these limitations, this research makes a significant contribution to the understanding of how underlying psychological traits and one's motivations influence decisions to comment on news stories. As news organizations and social media platforms grapple with the importance and value of allowing comments and commenters, this research helps inform those decisions by painting a picture of those who are commenting as extraverted and intellectual, if also strategic and cold at times. Regardless, it helps to demonstrate that the motivations and traits of those who comment are not uniform and are more complex than perhaps previously conceptualized.

CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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