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Self-Absorbed and Socially (Network) Engaged: Narcissistic Traits and Social Networking Site Use

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Abstract

Across two studies, the current research investigated how different dimensions of narcissism (grandiosity/agentic extraversion, entitlement/self-centered antagonism, vulnerability/narcissistic neuroticism) relate to social networking site (SNS) use and behaviors. Study 1 employed a community sample of young adults, whereas Study 2 examined college students. Participants completed assessments of narcissism and SNS use through an online survey. Grandiosity/agentic extraversion was generally associated with greater levels of downward social comparison relative to the other two dimensions. Entitlement/self-centered antagonism generally showed weak correlations with SNS outcomes. Vulnerability/narcissistic neuroticism was generally associated with greater upward social comparison and perceived social exclusion relative to the other two dimensions. Results suggest that SNS experiences may vary depending on the dimensions of narcissism.

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Open Practices

The studies reported in this paper were not pre-registered. Study materials and code for both Study 1 and 2 are available on Open Science Framework, as well as the data for Study 2 (<https://osf.io/a4d5j/>). Data are not available for Study 1 as the study collected sensitive information from participants.

Keywords

narcissism; social media; social networking sites; active use; passive use; social comparison; social exclusion

Social networking site (SNS) use remains highly prevalent among U.S. adults, particularly young adults (Perrin & Anderson, 2019). Researchers have suggested that SNSs may be especially attractive to people with higher levels of narcissism, as SNSs can be used to engage in self-promoting self-presentation (Buffardi & Campbell, 2008). Given that SNSs are increasingly intertwined with people's social relationships (Subrahmanyam & Smahel, 2011), investigating links between narcissism and SNS use is needed in order to more fully understand how narcissism relates to interpersonal behavior. Examining these relations is especially important as engaging in different behaviors on SNSs can have repercussions for real-life outcomes (e.g., Underwood & Ehrenreich, 2017). Moreover, SNS behaviors and their offline counterparts may mutually reinforce one another (e.g., Subrahmanyam & Smahel, 2011).

Several studies have examined how narcissism relates to different indices of SNS use (see Gnambs & Appel, 2018; Liu & Baumeister, 2016; McCain & Campbell, 2016, for metaanalyses). Nevertheless, this research is limited in three key ways. First, although narcissism is multifaceted (e.g., with dimensions of grandiosity/agentic extraversion, entitlement/self-centered antagonism, and vulnerability/narcissistic neuroticism; Back et al., 2013; Pincus & Lukowitsky, 2010; Miller, Lynam, McCain, et al., 2016), most SNS research has focused solely on grandiosity/agentic extraversion. These studies typically find that grandiosity/agentic extraversion is associated with greater activity on SNSs, such as overall time spent, frequency of status updates, number of friends and followers, and posting selfies (McCain & Campbell, 2016). Relations with entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism, however, are unclear due to few studies measuring these dimensions (McCain & Campbell, 2016). Second, most studies have examined general indices of SNS use (e.g., time online, number of friends) or active use (e.g., frequency of posting) rather than other common activities, such as passively browsing SNSs (i.e., scrolling through SNS content without direct interaction), engaging in social comparison, and experiencing feelings of social exclusion (Underwood & Ehrenreich, 2017). Third, most studies have focused either solely on Facebook or on behaviors across SNS platforms in general. However, given that different SNS platforms have different characteristics (Wilson, Gosling, & Graham, 2012), associations between SNS behaviors and narcissism may manifest differently across platforms. The current research extends previous research by focusing on multiple dimensions of narcissism and a wider set of SNS outcomes across two studies. One study examined Facebook use in a community sample of young adults, and the second examined Facebook, Instagram, and Snapchat use in college students.

Tripartite Conceptualizations of Narcissism

The Narcissism Spectrum Model (NSM) posits that self-absorption and an entitled self-image (e.g., expectations that you have a right to some positive outcome or deserve special treatment) lie at the core of narcissism (Krizan & Herlache, 2018). This entitled self-image

can manifest itself in expressions of grandiosity (i.e., an inflated self-image characterized by approach-related motivational tendencies and behaviors) and vulnerability (i.e., a depleted self-image characterized by avoidance-related motivational tendencies and behaviors).

Donnellan, Ackerman, and Wright (in press) performed a non-exhaustive review to provide insights into the nomological networks for grandiosity, entitlement, and vulnerability. Although all three dimensions are tied to less agreeableness and warmth and more anger and conflict, some correlates are unique to each dimension. People with greater levels of entitlement possess higher neuroticism and anger, and lower self-control. In addition, these individuals experience pronounced levels of envy, are less inclined to trust and forgive others, and display lower levels of empathy. Similarly, people with greater levels of vulnerability exhibit higher neuroticism, anger and depression, and experience pronounced levels of envy and decreased levels of trust. However, they are also more submissive, and report lower levels of self-esteem and positive affect. In contrast, people with greater levels of grandiosity possess traits including higher levels of extraversion and dominance. They also experience greater subjective well-being and positive affect, decreased depression, and higher levels of self-esteem.

The Trifurcated Model of Narcissism (TMN) proposes a similar conceptualization of narcissism (Crowe, Weiss, Lynam, Campbell, & Miller, in press). In contrast to the NSM, which emphasizes motivational differences between the facets of narcissism, the TMN utilizes a Five-Factor Model (FFM) perspective. Specifically, the model suggests that antagonism lies at the core of narcissism, with agentic extraversion (analogous to grandiosity) and narcissistic neuroticism (analogous to vulnerability) as peripheral components. Self-centered antagonism is argued to tie together agentic extraversion/grandiosity and narcissistic neuroticism/vulnerability. The TMN also differs from the NSM in the breadth of its conceptualization of antagonism, with the NSM adopting a narrower approach in defining the core of narcissism (which, as aforementioned, is entitlement). However, the expected interpersonal associations with the three dimensions of narcissism are the same across the two models, and therefore both models are useful in informing hypotheses regarding how narcissism relates to different types of SNS use and behaviors. In reviewing the literature, we refer to both sets of terminology.

Narcissism and Social Networking Site Use

SNSs are, by definition, interpersonal in nature (boyd & Ellison, 2007). There are numerous features pertinent to these platforms that facilitate social connection, for better or for worse. Users can actively engage with others by posting various kinds of content, or they can passively observe what others post. Additionally, SNSs may amplify several normative social processes. For instance, due to the wealth of easily accessible information about peers presented on SNSs, these platforms are an optimal venue for social comparison (Manago, Graham, Greenfield, & Salimkhan, 2008). Moreover, given the commonplace behavior of uploading posts on SNSs that depict friends (Hu, Manikonda, & Kambhampati, 2014), SNS platforms may also display social gatherings to which one is not invited, thus potentially enhancing perceptions of social exclusion (Underwood & Ehrenreich, 2017). The affordances provided by SNSs that encourage self-promotion (e.g., features of active use,

such as posting content) make these platforms ideal for those higher in narcissism (Buffardi & Campbell, 2008), namely grandiosity/agentive extraversion. However, other components (e.g., passive use, perceived exclusion) may be more closely related to other dimensions of narcissism, such as vulnerability/narcissistic neuroticism. Nonetheless, little research has examined vulnerability/narcissistic neuroticism (as well as entitlement/self-centered antagonism) in conjunction with different types of SNS outcomes.

Active use.

Active use refers to publicly posting or interacting with others on SNSs, such as through posting photos or “selfies” or by uploading status updates or other posts. Most investigations examining SNS use and narcissism have examined grandiosity/agentive extraversion and active use, usually measuring narcissism using the total score of the Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988). Although the NPI primarily captures grandiosity/agentive extraversion (Krizan & Herlache, 2018), there is some content on the NPI that taps into entitlement/self-centered antagonism as well (Ackerman et al., 2011; Crowe et al., in press). Given the NPI’s more primary assessment of grandiosity/agentive extraversion, however, previous literature that uses the total scale will be interpreted in the context of grandiosity/agentive extraversion¹. Meta-analyses suggest significant, positive relations between grandiosity/agentive extraversion and various active use behaviors, including posting frequency (e.g., status updates, tweets), posting selfies, and posting photos (Liu & Baumeister, 2016; McCain & Campbell, 2016). The other dimensions of narcissism have received less attention. Entitlement/self-centered antagonism has been found to be positively associated with general posting frequency on SNSs, and, for men, posting selfies (Weiser, 2015), as well as posting Facebook status updates (although not photo uploads; Lee, Ahn, & Kim, 2014). However, other studies have found little robust evidence of a relation between entitlement/self-centered antagonism and active use (Ho Moon, Lee, Lee, Choi, & Sung, 2016; March & McBean, 2018; Panek, Nardis, & Konrath, 2013; Zell & Moeller, 2017). Vulnerability/narcissistic neuroticism generally has little to no relation with active behaviors, such as posting selfies on SNSs (Barry, Doucette, Loflin, Rivera-Hudson, & Herrington, 2017; McCain et al., 2016).

Passive use.

Passive use refers to scrolling through SNS content without direct interaction. Research examining grandiosity/agentive extraversion and passive use is inconsistent: whereas some studies found no relation (Bergman, Fearrington, Davenport, & Bergman, 2011; Stiff, 2019, as assessed with the Short Dark Triad [Jones & Paulhus, 2014]) or inconsistent relations across different samples (Ozimek, Bierhoff, & Hanke, 2018), one study found it to be correlated with the motive to use SNSs to surveil others (Dumas, Maxwell-Smith, Davis, & Giulietti, 2017). Vulnerability/narcissistic neuroticism is positively related to watching others on Facebook (Ozimek et al., 2018), as well as the motive to use SNSs to surveil

¹Given that the majority of studies have examined narcissism using some form of the NPI, all subsequent reviewed studies that use the total NPI or the grandiose exhibitionism subscale of the NPI will be referred to as measuring grandiosity/agentive extraversion, for simplicity. If a study measured grandiosity with an alternative assessment, the assessment is stated.

others (Sheldon & Bryant, 2016). No studies to our knowledge have examined links with entitlement/self-centered antagonism.

Social Comparison.

In the absence of objective information, people compare the self to others, particularly similar others (Festinger, 1954). These comparisons can be upward (i.e., perceiving that others are better off; Wheeler, 1966) or downward (i.e., perceiving that others are worse off; Wills, 1981). Each type of social comparison can elicit both positive and negative emotional responses (Smith, 2000). However, upward comparisons on SNSs are often associated with negative emotional responses (e.g., envy; Verduyn, Ybarra, Résibois, Jonides, & Kross, 2017). Downward SNS social comparison is less studied, but preliminary evidence suggests that these comparisons are more often associated with positive emotional responses on SNSs (e.g., joyfulness; Rosenthal-von der Putten et al., 2019).

As a whole, all three dimensions of narcissism are positively associated with making social comparisons (Donnellan et al., in press; Lamkin, Clifton, Campbell, & Miller, 2014; Lange, Crusius, & Hagemeyer, 2016). Grandiosity/agentive extraversion is associated with making more downward comparisons (Krizan & Bushman, 2011), as well as experiencing more positive affect after making a social comparison and more hostility when making an upward comparison (as assessed by the total NPI; Bogart, Benotsch, & Pavlovic, 2004). Moreover, those higher in entitlement/self-centered antagonism report experiencing greater positive affect and self-esteem after a downward comparison (Bogart et al., 2004). Little research has examined narcissism and relations to frequency of making social comparisons in SNS contexts. One study suggests that those higher in grandiosity/agentive extraversion (as measured by the Short Dark Triad) engage in more downward comparisons when browsing Facebook profiles (Lopes & Yu, 2017), although other research suggests that it is unrelated to making social comparisons on Instagram (Meier & Schafer, 2018). Additionally, a series of studies found that social comparison orientation (i.e., the dispositional tendency to make social comparisons; Gibbons & Buunk, 1999) mediates the relation between vulnerability/narcissistic neuroticism and greater Facebook use, whereas this path was not supported for grandiosity/agentive extraversion (Ozimek et al., 2018).

Perceived Online Exclusion.

SNSs present a new context in which people may perceive social exclusion, as users can view content depicting social events to which they were not invited. To the best of our knowledge, only one study has examined perceived online exclusion in conjunction with narcissism (Fossati, Somma, & Borroni, 2017). This research manipulated social exclusion in a paradigm mimicking a Facebook experience, in which participants received few likes on their profile. The study examined associations with the Five-Factor Narcissism Inventory (FFNI), the subscales of which follow the TMN² (Miller, Lynam, McCain, et al., 2016). After experiencing social exclusion, those higher in agentive extraversion reported lower threatened self-esteem and greater positive feelings; those higher in narcissistic neuroticism

²The authors also examined the FFNI's general scales of grandiosity and vulnerability, with slightly different results. We report on the results with the three subscales here, as it better aligns with our research strategy of examining the three dimensions of narcissism.

reported greater threatened self-esteem; and those higher in self-centered antagonism reported lower threatened self-esteem but greater negative emotions and exclusion feelings (Fossati et al., 2017). Thus, those higher in grandiosity/agentic extraversion may be protected from negative effects of perceived social exclusion on SNS. In contrast, those higher in vulnerability/narcissistic neuroticism may be particularly susceptible to negative effects of SNS social exclusion, and those higher in entitlement/self-centered antagonism may experience mixed emotions.

The Current Research

The goal of the current research was to investigate how the three dimensions of narcissism relate to different types of SNS use and SNS behaviors. Study 1 recruited a community sample of young adults to investigate these relations on Facebook. Study 2 aimed to replicate these findings with a large sample of college students, and further extended this research by examining two popular SNS platforms in addition to Facebook: Instagram and Snapchat.

Our hypotheses were primarily guided by the aforementioned characteristics defining each dimension of narcissism (Donnellan et al., in press). The self-promoting and dominant characteristics of grandiosity/agentic extraversion suggest that these individuals should report increased active use and decreased passive use. Moreover, due to having an inflated self-image, these individuals should engage in greater downward comparison and less upward comparison, and perceive less exclusion. In contrast, the submissive tendencies of those higher in vulnerability/narcissistic neuroticism suggest that they should report decreased active use and increased passive use. Moreover, given that these individuals are also higher in neuroticism and experience increased feelings of envy, a key social comparison emotion (Smith, 2000), they should engage in greater upward comparison and less downward comparison, and perceive more exclusion. Because those higher in entitlement/self-centered antagonism also typically report increased envy and neuroticism, they should report greater upward comparison, less downward comparison, and more perceived exclusion. Relations of entitlement/self-centered antagonism with active and passive use are unclear and therefore will be examined as exploratory. In addition, as the TMN bases its conceptualization of narcissism on the FFM, the most relevant FFM traits (extraversion, (low) agreeableness, neuroticism) were assessed in Study 2 to explore if the FFM trait associations with SNS use paralleled associations observed with the narcissism dimension composites.

Analysis Plan for Studies 1 and 2

We first examined the zero-order correlations between the different dimensions of narcissism and each SNS outcome. We then ran tests of differences in dependent correlations using the psych package (Revelle, 2018) in R (R Core Team, 2015) to determine if the dimensions of narcissism differed in the strength of their relations with each SNS outcome. Given the large number of tests run across both studies, we adopted a significance level of $p < .01$ for all analyses. Additionally, we investigated the unique relations between the narcissism dimensions and SNS outcomes, by specifying path analyses with lavaan

(Rosseel, 2012) in R, using Full Information Maximum Likelihood to handle missing data³. These analyses can be found in the supplemental materials. Readers can access the R syntax and output on the OSF page for this project: <https://osf.io/a4d5j/>

Power for Study 1 was limited, as the study was part of a larger longitudinal study that was impacted by attrition. Study 2 was designed to address this limitation with a larger sample size. Due to the lack of previous studies examining vulnerability/narcissistic neuroticism and entitlement/self-centered antagonism, the expected size of many of our effects were unclear. Nevertheless, previous research suggests that effect sizes with grandiosity/agentic extraversion are generally small (Liu & Baumeister, 2016; McCain & Campbell, 2016), and our results from Study 1 suggested effect sizes that could range from small to large. Thus, we obtained a sample size for Study 2 that enabled us to detect small effect sizes with sufficient power.

Study 1: Method

Participants

Data come from a longitudinal study examining youth social aggression and digital communication. Participants were initially recruited from a suburban county in the southwestern United States, and were followed from third grade through high school. Approximately four years following high school graduation (Summer 2016), participants were invited to participate in a follow-up survey, which is the focus of the current research. Out of the 359 participants who participated in at least one wave of the study, 136 participated in the follow-up wave. Two participants who did not have Facebook accounts were omitted, resulting in a total sample of 134 participants ($M_{age}=22.15$, $SD_{age}=0.48$; 55% female). The sample was ethnically diverse (52% White/Caucasian, 22% Black/African-American, 19% Hispanic/Latinx, 4% Asian, and 3% Mixed/Other). A chi-square test indicated that there were no gender and race differences between the participants who completed this wave of the study and those who did not ($p's>.12$). Attrition analyses also compared participants and non-participants on narcissism and Facebook use variables assessed during the high school graduation time point. A series of t-tests revealed no differences in terms of overall and daily Facebook use or NPI-measured⁴ grandiose exhibitionism, entitlement/exploitativeness, and leadership/authority ($p's>.44$).

Measures

Narcissism.—Grandiosity/agentic extraversion, entitlement/self-centered antagonism, and vulnerability/narcissistic neuroticism were operationalized using scales from the Narcissistic Admiration and Rivalry Questionnaire (NARQ; Back et al., 2013) and the Brief Pathological Narcissism Inventory (BPNI; Schoenleber, Roche, Wetzell, Pincus, & Roberts, 2015). The NARQ assesses the dimensions of *admiration* (e.g., “I am great”) and *rivalry* (e.g., “I want my rivals to fail”). This scale used a 6-point Likert-type scale (1=Not agree at all; 6=Agree

³For Study 1, 16% of participants were missing data for the upward comparison items, 14% were missing data for the remaining Facebook items, and one participant was missing data for the narcissism items. There was little missing data for Study 2 (<2% for all key study variables).

⁴The high school graduation time point was the last time point where NPI data were available; the time point of focus in the present study utilized alternative measures of narcissism.

completely). We used the 9-item admiration scale to operationalize grandiosity/agentive extraversion ($\alpha=.81$) and the 9-item rivalry scale to operationalize entitlement/self-centered antagonism ($\alpha=.87$).

The BPNI is a shortened version of the Pathological Narcissism Inventory (Pincus et al., 2009) that assesses the dimensions of pathological vulnerability (e.g., “It’s hard to show others the weaknesses I feel inside”) and grandiosity (e.g., “I find it easy to manipulate people”) using a 6-point Likert-type scale (1=Not at all like me; 6=Very much like me). We used the 16-item vulnerability scale ($\alpha=.92$) to operationalize vulnerability/narcissistic neuroticism. The grandiosity scale from the Pathological Narcissism Inventory tends to be less consistent with conceptualizations of grandiosity (Krizan and Herlache, 2018), and empirical investigations examining associations with alternative assessments of grandiosity have found it to have rather weak relations with these measures (Miller & Lynam, 2017; Miller, Lynam, & Campbell, 2016; Miller, Lynam, Hyatt, & Campbell, 2017). Thus, we chose to omit it from our operationalization of grandiosity in both studies.

Active and passive Facebook use.—Active and passive Facebook use were measured with a modified version of the Multidimensional Scale of Facebook Use (Frison & Eggermont, 2015). Active use was measured with two items⁵ (e.g., “How often do you post a message on your own Facebook timeline?”; “How often do you post a photo on your own Facebook timeline?” $\alpha=.86$). Passive use was measured with two items (e.g., “How often do you visit a Facebook profile of a Facebook friend?”; “How often do you visit a Facebook profile of someone that does not belong to your Facebook network?”; $\alpha=.80$). Participants reported on a 7-point Likert-type scale (1=Never; 7=Several times per day).

Social comparison.—Our measurement of social comparison focused on affective consequences⁶ of engaging in social comparison on Facebook. Participants were asked: “How often do you look at Facebook and compare your experiences to what other people are doing?” Next, a question measuring upward comparison asked, “How often does this make you feel bad about yourself?” and a question measuring downward comparison asked, “How often does this make you feel good about yourself?” Both items used an 8-point Likert-type scale (1=More than 20 times per day; 8=Less often or never). These items were reverse coded so that higher scores indicated more social comparison.

Perceived exclusion.—Our measure of perceived exclusion focused on the affective consequences of exclusion. Participants were asked: “How often do you look at Facebook and feel hurt or left out by seeing friends doing things without you?” The item used the same

⁵This measure consists of an additional item (“How often do you post something else (e.g., a picture or video) on your own Facebook timeline?”). Unfortunately, due to experimenter error, this item had a sentence structure error that altered the meaning of the item, and therefore it was omitted from analyses.

⁶We recognize that social comparison can result in different types of affective experiences, such as how upward comparison can result in positive emotions (e.g., inspiration), and downward comparison can result in negative emotions (e.g., pity; Smith, 2000). However, as aforementioned, research suggests that for social comparisons specifically on SNSs, upward comparisons may more often be associated with negative emotions and downward comparisons associated with positive emotions (Rosenthal-von der Pütten et al., 2019; Verduyn et al., 2017). Thus, we believe our social comparison measurements mirror the typical types of emotional consequences that accompany upward and downward comparison on SNSs.

8-point Likert-type scale as the social comparison items. Responses were reverse-coded so that higher scores indicated greater perceived social exclusion.

Study 1: Results

Descriptive statistics are reported in Table 1. Perceived exclusion was especially positively skewed; consequently, a square root transformation was applied to this variable for all analyses ($M=1.29$, $SD=0.44$, skewness=1.78, kurtosis=2.65). In addition, correlations between the measures of narcissism suggest that the NARQ Admiration scale was moderately correlated with the NARQ Rivalry scale ($r=.35$) and the BPNI Vulnerability scale ($r=.25$); the NARQ Rivalry scale and BPNI Vulnerability scale were strongly correlated ($r=.65$).

Zero-order correlations are presented in Table 2, along with the results of tests of differences in dependent correlations. Grandiosity/agentic extraversion was moderately positively correlated with active use, but this correlation did not significantly differ from the other dimensions. Vulnerability/narcissistic neuroticism was moderately positively correlated with passive use, but this correlation did not significantly differ from the other dimensions. All three dimensions of narcissism were moderately positively correlated with downward comparison, and these correlations did not significantly differ from each other. Entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism had moderate-to-strong positive correlations with upward comparison. Although the strength of these correlations did not differ between each other, both were significantly stronger than grandiosity/agentic extraversion. Likewise, entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism had moderate-to-strong positive correlations with perceived exclusion. Again, these correlations did not differ from each other, but both were significantly stronger than grandiosity/agentic extraversion.

Study 2

Study 1 found that grandiosity/agentic extraversion was associated with greater active use and downward comparison, that entitlement/self-centered antagonism was associated with greater downward comparison, upward comparison, and perceived social exclusion, and that vulnerability/narcissistic neuroticism was associated with greater passive use, downward comparison, upward comparison, and perceived social exclusion. Notably, correlations generally did not significantly differ from each other across the three dimensions of narcissism, with the exception of entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism being more strongly associated than grandiosity/agentic extraversion with upward comparison and perceived exclusion. Because Study 1 was part of a larger study, measures of Facebook use and behaviors were limited to reduce participant response burden. Thus, a second study was conducted in an attempt to replicate the findings in a sample of undergraduate students. Study 2 expanded on Study 1 by including a larger sample and more comprehensive assessments of narcissism, and by examining multiple SNS platforms.

Study 2: Method

Participants

Participants included 814 undergraduates recruited from a large, southwestern university (76% female; $M_{\text{age}}=20.76$, $SD_{\text{age}}=4.09$) during the Fall 2018 semester. Participants reported being 42% Asian/Asian-American, 33% White/Caucasian, 15% Hispanic/Latinx, 7% Black/African-American, and 3% Mixed Race/Other. Students were recruited through online advertisements and completed the study entirely online via Qualtrics. Participants received course credit for completing the study.

Measures

Narcissism.—Participants completed a battery of measures assessing multiple dimensions of narcissism, including the NPI (Raskin & Terry, 1988), the NARQ (Back et al., 2013), the Five-Factor Narcissism Inventory-Short Form (FFNI; Glover et al., 2012; Sherman et al., 2015), and the BPNI (Schoenleber et al., 2015; Pincus et al., 2009). The NPI was administered to participants in forced-choice format, with participants choosing between two possible statements in terms of which statement is closer to the self (e.g., “I like to be the center of attention” versus “I prefer to blend in with the crowd”). Scores were coded so that the statement exemplifying narcissism received a ‘1’, whereas the other statement received a ‘0’. We derived subscales from the NPI using the Ackerman et al. (2011) factor solution (Leadership/Authority: $\alpha=.76$; 11 items; Grandiose Exhibitionism: $\alpha=.75$; 10 items; Entitlement/Exploitativeness: $\alpha=.49$; 4 items). Participants used the same 6-point Likert-type scale from Study 1 to respond to questions on the NARQ, and we computed subscales for Admiration ($\alpha=.83$; 9 items) and Rivalry ($\alpha=.85$; 9 items). The FFNI-Short form asked participants to respond to 60 items using a 5-point Likert-type scale (1=Strongly Disagree, 5=Strongly Agree). Based on Miller, Lynam, McCain, et al. (2016), we computed scales from the FFNI for Extraversion (e.g., “I am extremely ambitious”; $\alpha=.85$; 16 items), Antagonism (e.g., “I don’t think the rules apply to me as much as they apply to others”; $\alpha=.92$; 32 items), and Neuroticism (e.g., “When I realize I have failed at something, I feel humiliated”; $\alpha=.87$; 12 items). We also computed the FFNI Vulnerability subscale (e.g., “I often feel as if I need compliments from others in order to be sure of myself”; $\alpha=.82$, 16 items). Participants used the same 6-point Likert-type scale from Study 1 to respond to Vulnerability items from the BPNI ($\alpha=.89$; 16 items), with the grandiosity scale again omitted.

Participants also completed measures that targeted individual dimensions of narcissism, including the Narcissistic Grandiosity Scale (Rosenthal, Hooley, & Steshenko, 2007), the Psychological Entitlement Scale (Campbell, Bonacci, Shelton, Exline, & Bushman, 2004), and the Hypersensitive Narcissism Scale (Hendin & Cheek, 1997). Participants used a 9-point Likert-type scale (1=Not at all; 9=Extremely) to rate themselves on 16 adjectives (e.g., “Perfect”, “Envious”) for the Narcissistic Grandiosity Scale ($\alpha=.96$). Participants responded to nine items from the Psychological Entitlement Scale using a 7-point Likert-type scale (1=Strong Disagreement; 7=Strong Agreement; e.g., “Great things should come to me”; $\alpha=.87$). Finally, participants responded to ten items from the Hypersensitive Narcissism Scale using a 5-point Likert-type scale (1=Very uncharacteristic or untrue, Strongly

disagree; 5=Very characteristic or true, Strongly agree; e.g., “My feelings are easily hurt by ridicule or by the slighting remarks of others”; $\alpha=.77$).

To ensure that our substantive conclusions were not tied to a single operationalization of narcissism (cf. Miller et al., 2017), we created composites for each narcissism dimension that grouped measures together based on recommendations aligned with the NSM (Krizan & Herlache, 2018; Wright & Edershile, 2018) and the TMN (Crowe et al., in press). For the NSM composites, we created a grandiosity composite variable ($\alpha=.84$, average inter-item $r=.51$) by standardizing and averaging the NPI Leadership/Authority scale, the NPI Grandiose Exhibitionism scale, the NARQ Admiration scale, the Narcissistic Grandiosity Scale, and the FFNI Extraversion scale. Similarly, we created an entitlement composite variable ($\alpha=.80$, average inter-item $r=.50$) by standardizing and averaging the NPI Entitlement/Exploitativeness scale, the NARQ Rivalry scale, the Psychological Entitlement Scale, and the FFNI Antagonism scale. Finally, we created a vulnerability composite variable ($\alpha=.78$, average inter-item $r=.55$) by standardizing and averaging the BPNI Vulnerability scale, the Hypersensitive Narcissism Scale, and the FFNI Neuroticism scale. For the TMN composites, we created an agentic extraversion composite ($\alpha=.83$, average inter-item $r=.55$) by standardizing and averaging the FFNI Extraversion scale, the NARQ Admiration scale, the NPI Leadership scale, and the Narcissistic Grandiosity Scale. We created a self-centered antagonism scale ($\alpha=.76$) by standardizing and averaging the FFNI Antagonism scale and the NARQ Rivalry scale. We created a narcissistic neuroticism scale ($\alpha=.85$) by standardizing and averaging the FFNI Vulnerability scale and the BPNI vulnerability scale. By constructing composites based on both the NSM and TMN, we can evaluate whether our results are contingent on the particular aggregation method chosen⁷.

Active and passive use.—Participants completed a modified version of the Multidimensional Scale of Facebook Use for Facebook, as well as modified versions for Instagram and Snapchat to ensure the items were applicable to each platform’s features (Frison & Eggermont, 2015). All items were responded to on a 7-point Likert-type scale (1=Never; 7=Several times per day). Factor analyses were run to ensure the factor structure observed on Facebook extended to Instagram and Snapchat (see supplemental materials). With the exception of Snapchat passive use (2 items; $\alpha=.55$), internal consistency was acceptable for all scales (Facebook active use: 3 items, $\alpha=.76$; Facebook passive use: 4 items, $\alpha=.88$; Instagram active use: 3 items, $\alpha=.82$; Instagram passive use: 4 items, $\alpha=.88$; Snapchat active use: 3 items, $\alpha=.94$).

Downward social comparison.—Participants completed the 11-item Social Comparison Scale (Allan & Gilbert, 1995), which has been previously used in SNS research (e.g., Feinstein et al., 2013). Participants were asked about how they felt in relation to others on a series of bipolar traits for each platform (e.g., “When on Facebook, in relation to others I generally feel... inferior/superior”; α ’s=.92-.95). Participants completed items on a 10-point scale, with participants selecting “1” if they identified strongly with the first trait and

⁷Additional analyses were performed with each of the subscales comprising the composites, and we found that the results from these analyses generally paralleled those found for the composites. These and other analyses evaluating the placement of each subscale in each composite can be found in the supplementary materials for this manuscript.

“10” if they identified strongly with the second trait. Therefore, this scale captured social comparison on a spectrum, with lower values indicating greater upward comparison and higher values indicating greater downward comparison. Because higher values indicated greater downward comparison, we henceforth refer to this variable as downward comparison. It is important to note that, in contrast to the downward comparison measure in Study 1, this assessment of comparison was not confounded by affect (e.g., one could feel superior to others but not necessarily good).

Upward social comparison.—Participants completed Lee’s (2014) three item negative social comparison scale. Participants answered items with a 5-point Likert-type scale, with items also adapted for Instagram and Snapchat (1=Strongly Disagree; 5=Strongly Agree; α ’s=.85-.90; e.g., “On Facebook, when I read news feeds (or see others’ photos), I often think that others are having a better life than me”). Because this variable focuses on perceptions of inferiority in comparison to others, it will be referred to as upward comparison for this research. It is important to note that, in contrast to Study 1, the items did not necessarily suggest an affective response to upward comparison (e.g., one can perceive that others have a better life but not necessarily feel bad).

Perceived online exclusion.—Due to a lack of existing measures assessing perceived online exclusion at the time of data collection, six items were developed to measure the degree to which participants view content depicting events to which they were not invited (three items), as well as the degree to which they were negatively emotionally impacted by this exclusion (three items). Because participants did not respond to the emotional impact items if they indicated that they never viewed content that depicted social events to which they were not invited, only the viewing items were included for the current study. Participants responded to items using a 5-point Likert-type scale (1=Never, 5=Always). Items were asked for each social media platform (e.g., “On Facebook, how often do you see social events to which you were not invited?”; α ’s=.69-.83).

FFM traits.—Participants completed the 44-item Big Five Inventory (John & Srivastava, 1999) using a 5-point Likert-type scale (1=Disagree Strongly; 5=Agree Strongly). The Big Five Inventory assesses extraversion (eight items; α =.85; e.g., “I see myself as someone who is talkative”), neuroticism (eight items; α =.81; e.g., “I see myself as someone who is depressed, blue”), and agreeableness (nine items; α =.74; e.g., “I see myself as someone who is helpful and unselfish with others”). To better parallel self-centered antagonism, agreeableness was reverse scored so that higher levels indicated greater antagonism.

Study 2: Results

Six hundred and forty-five participants reported having a Facebook account, 635 reported having an Instagram account, and 610 reported having a Snapchat account. Descriptive statistics are presented in Table 3. Zero-order correlations for the different narcissism scales and the FFM traits are presented in Table 4. Zero-order correlations for the narcissism composites, FFM traits, and SNS outcomes are presented in Table 5, along with the results of the tests of differences in dependent correlations.

Grandiosity/Agentic Extraversion.

Grandiosity and agentic extraversion had small positive correlations with active Facebook use, and moderate positive correlations with both active Instagram and Snapchat use. Small-to-moderate positive correlations were also observed for passive use across all three platforms. Although grandiosity and agentic extraversion exhibited moderate-to-large positive correlations with downward comparison across all platforms, they were generally unrelated to upward comparison, with the exception of small, negative correlations for Facebook. There were no significant relations with perceived exclusion.

Entitlement/Self-Centered Antagonism.

Entitlement and self-centered antagonism had small-to-moderate positive correlations with active use across platforms, although the correlation between self-centered antagonism and active Facebook use was not significant. Small-to-moderate positive correlations were also observed for passive use across all three platforms. Entitlement and self-centered antagonism were generally unrelated to downward comparison, with the exception of a small, positive correlation observed for entitlement on Snapchat. Small-to-moderate positive correlations were observed for upward comparison across all three platforms. Entitlement and self-centered antagonism were generally unrelated to perceived exclusion, with the exception of small, positive correlations observed for Snapchat.

Vulnerability/Narcissistic Neuroticism.

Vulnerability and narcissistic neuroticism were unrelated to active SNS use. Small-to-moderate positive correlations were observed for passive use across all three platforms. Vulnerability and narcissistic neuroticism also had small-to-moderate negative correlations with downward comparison across all three platforms, though the relation between downward comparison and narcissistic neuroticism was not significant for Snapchat. In addition, moderate-to-large positive correlations were observed for upward comparison across all platforms, and small-to-moderate correlations were observed for exclusion across all platforms.

Comparing trait-to-SNS relations among narcissistic traits.

There were notable differences in the strength of relations between the narcissism dimensions and SNS outcomes. First, grandiosity/agentic extraversion significantly differed from entitlement/self-centered antagonism for both downward comparison and upward comparison across all three platforms. The two dimensions also differed from each other for active Snapchat use. Second, grandiosity/agentic extraversion significantly differed from vulnerability/narcissistic neuroticism for downward comparison, upward comparison, and perceived exclusion across all three platforms. The two dimensions also differed from each other for active Instagram and Snapchat use. Third, entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism significantly differed from each other in their relations with downward comparison, upward comparison, and perceived exclusion across all three platforms. Notably, whereas entitlement and vulnerability significantly differed from each other for active use across all platforms, self-centered antagonism and narcissistic neuroticism did not differ from each other in their relations with active use on any platform.

Despite some slight differences noted above, the pattern of associations with SNS outcomes for the parallel NSM and TMN composites were highly similar. Using similarity correlations to quantify the correspondence between the correlation profiles (Samuel & Widiger, 2008), we found that the parallel NSM and TMN narcissistic traits displayed near identical profiles: grandiosity and agentic extraversion $r = .998$, entitlement and self-centered antagonism $r = .958$, and vulnerability and narcissistic neuroticism $r = .996$. This suggests that the choice of aggregation method made little difference.

Comparisons between the TMN and FFM Traits.

As the TMN maps onto the personality traits of extraversion, antagonism, and neuroticism, these traits were included to examine if the findings observed for the TMN generally paralleled findings with these traits. Although many relations were similar, there were some notable differences, particularly between self-centered antagonism and antagonism. Similarity correlations corroborated this observation. Associations between agentic extraversion and extraversion ($r = .971$) and narcissistic neuroticism and neuroticism ($r = .974$) were nearly perfectly correlated, whereas associations between self-centered antagonism and antagonism were substantially weaker ($r = .513$).

Discussion

Across two studies, we investigated how three dimensions of narcissism relate to different types of SNS use and behaviors. We hypothesized that grandiosity/agentic extraversion would be associated with greater dominant and self-promoting behaviors such as greater active use and downward comparison, and less passive use, upward comparison, and perceived exclusion. Additionally, we predicted that entitlement/self-centered antagonism would be associated with greater neurotic behaviors such as upward comparison and perceived exclusion, and less downward comparison. Last, we expected that vulnerability/narcissistic neuroticism would be associated with greater submissive and neurotic behaviors, such as greater passive use, upward comparison, and perceived exclusion, and less active use and downward comparison. Overall, there was mixed support for these hypotheses.

Active use.

Consistent with previous research (Liu & Baumeister, 2016; McCain & Campbell, 2016), grandiosity/agentic extraversion was positively associated with active use, across both studies and across all platforms. Entitlement/self-centered antagonism was positively associated with active use for all platforms in Study 2 (although not with Facebook active use when using the TMN composite), but was not significantly associated with active use in Study 1, perhaps due to a lack of power to detect the effect. Vulnerability/narcissistic neuroticism was not associated with greater active use. The correlations did not significantly differ from each other in Study 1, but there were notable differences in Study 2. There were slight variations depending on which model composites were used: when using the NSM, vulnerability differed from both grandiosity and entitlement (with the exception of no difference with active Facebook use with grandiosity), but when using the TMN, narcissistic neuroticism only differed from agentic extraversion (for Instagram and Snapchat only).

Grandiosity/agentive extraversion and entitlement/self-centered antagonism generally did not differ from each other, with the exception of Snapchat.

Perhaps the self-centered and self-important nature that unites grandiosity/agentive extraversion and entitlement/self-centered antagonism drives greater active use, as those high in this trait may use SNS posts in an attempt to solicit attention from others in order to sustain their feelings of specialness. Moreover, the extraverted and exhibitionist qualities of grandiosity/agentive extraversion may further enhance the correlation with active use, as these individuals may be especially motivated to engage in behaviors that involve actively publicly connecting with others. Notably, however, the stronger correlation between grandiosity/agentive extraversion and active use, relative to entitlement/self-centered antagonism, was only observed for Snapchat. This could be due to the norms that govern different SNS platforms. As indicated by our means, active Snapchat use was more frequent than active Facebook or Instagram use. Therefore, posting on Facebook and Instagram may be uncommon, and those high in grandiosity/agentive extraversion may be turning to Snapchat as posting may be more socially acceptable.

Passive use.

All three dimensions of narcissism had small-to-moderate correlations with passive use, although these correlations were not significant for grandiosity/agentive extraversion or entitlement/self-centered antagonism in Study 1. As demonstrated by our means and by previous research (Pempek, Yermolayeva, & Calvert, 2009; Verduyn et al., 2015), passively using SNSs is a relatively common activity. Therefore, engaging in this behavior may not be unique to a specific type of person, at least in terms of narcissistic tendencies.

Downward Social Comparison.

Aligned with previous research (Krizan & Bushman, 2011), grandiosity/agentive extraversion was consistently positively associated with downward comparison. Entitlement/self-centered antagonism was generally not associated with downward comparison, with the exceptions of a moderate positive correlation observed in Study 1 and a small positive correlation observed in Study 2 for Snapchat, with the NSM composite only. Vulnerability/narcissistic neuroticism was unexpectedly associated with greater downward comparison in Study 1, but was generally associated with less downward comparison in Study 2 (although the correlation was not significant for Snapchat when using the TMN composite). The unexpected finding for Study 1 could be due to idiosyncrasies of the small sample or differences in measurement of downward comparison. Correlations between grandiosity/agentive extraversion and downward comparison were significantly stronger compared to the other two dimensions in Study 2. The inflated self-image of those high in grandiosity may render them more likely to perceive that others are worse off than the self. Additionally, correlations between vulnerability/narcissistic neuroticism and downward comparison were significantly different from entitlement/self-centered antagonism in Study 2. Given the depleted self-image of those high in vulnerability/narcissistic neuroticism, it is unsurprising that these individuals are less likely to perceive that others are worse off than the self.

Upward social comparison.

Grandiosity/agentic extraversion was not robustly associated with upward comparison, with only one small negative correlation observed for Facebook in Study 2. Entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism were both consistently associated with greater upward comparison, across both studies and across all platforms. Correlations for all three dimensions of narcissism significantly differed from each other, with the exception of no difference between entitlement/self-centered antagonism and vulnerability/narcissistic neuroticism in Study 1. These findings are in line with previous research that has established that both dimensions are associated with greater feelings of envy (Donnellan et al., in press), a prominent emotion that results from making an upward comparison (Smith, 2000). Moreover, the depleted self-image characteristic of those high in vulnerability/narcissistic neuroticism may enhance these associations for these individuals, as they may be especially likely to perceive that others are doing better than the self.

Perceived social exclusion.

Grandiosity/agentic extraversion was not associated with perceived social exclusion in either study. Entitlement/self-centered antagonism was moderately positively correlated with social exclusion in Study 1, but was generally not correlated in Study 2, with the exception of a small correlation observed with Snapchat. Vulnerability/narcissistic neuroticism was consistently correlated with greater perceived social exclusion, across both studies and across all platforms. The correlations with vulnerability/narcissistic neuroticism were significantly different from the other two dimensions, with the exception of Study 1, with no difference with entitlement/self-centered antagonism. Entitlement/self-centered antagonism did not differ from grandiosity/agentic extraversion in Study 2. Thus, there is little robust evidence that entitlement/self-centered antagonism has unique, meaningful correlations with perceived exclusion. The findings with vulnerability/narcissistic neuroticism are in line with the characterization of this trait, as those who are highly neurotic with a depleted self-image may struggle socially, which may lead them to be excluded to various social events.

FFM traits.

Because the TMN relies on the FFM to conceptualize the different dimensions of narcissism, the most relevant FFM traits (extraversion, antagonism, and neuroticism) were examined to explore whether results paralleled those found for the TMN composites. Similarity correlations suggested that the pattern of SNS relations for extraversion and neuroticism were nearly perfectly correlated with the pattern of SNS relations for agentic extraversion and narcissistic neuroticism, respectively. These findings support the adaptation of a personality trait approach to studying narcissism, bolstering arguments that personality disorders manifest extremes of personality traits (Lynam & Widiger, 2001; Miller, Lynam, Widiger, & Leukefeld, 2001; Widiger, Trull, Clarkin, Sanderson, & Costa, 2002).

Notably, however, findings were less consistent with self-centered antagonism and antagonism, with the similarity correlation between the two much lower than the other parallel TMN and FFM dimensions. This discrepancy could be a result of using the Big Five Inventory to measure the FFM traits, as evidence suggests that the antagonism/agreeableness scale generally lacks the inclusion of the 'honesty-humility' facet of agreeableness (Crowe,

Lynam, & Miller, 2018; Miller, Gaughan, Maples, & Price, 2011). Thus, future research should explore these associations further with alternative measurements of FFM traits, particularly assessments of agreeableness/antagonism.

Limitations.

These findings should be considered in the context of several limitations. As aforementioned, Study 1 was limited by a small sample, a focus on just Facebook, and measurements of social comparison and perceived social exclusion that were confounded by emotional responses to these experiences. Study 2 addressed these limitations with a large sample and measurements of social comparison and perceived social exclusion that were relatively free of affect. Study 2 also examined the increasingly popular platforms of Instagram and Snapchat in addition to Facebook, with findings indicating how although many relations between constructs may replicate across platforms (e.g., vulnerability/narcissistic neuroticism and upward comparison; grandiosity/agentive extraversion and downward comparison), others may perhaps be platform-specific depending on the norms of the platform (e.g., grandiosity/agentive extraversion and active Snapchat use).

Study 2 also had several limitations. First, the study was conducted with college students with a large proportion being women, and therefore findings may not generalize to other populations. Notably, however, many findings paralleled the results seen in Study 1, which examined a community sample of young adults. Second, we created the measure of perceived online social exclusion, due to the lack of existing measures of the construct. Future research should replicate findings with a validated measure. Third, our measurements of upward and downward comparison were not parallel to each other. Our measure of downward comparison was on a spectrum, with downward comparison on one end and upward comparison on the other, whereas our measure of upward comparison solely measured the extent to which an individual engaged in upward comparison. Thus, for downward comparison, it may not necessarily be that positive relations indicate that participants engage in greater downward comparisons, but instead that they engage in fewer upward comparisons. Given that our main findings with downward comparison, at least in relation to grandiosity/agentive extraversion, were observed across studies, we can be reasonably confident that these individuals engage in greater downward comparison on SNSs, but future research should replicate these findings with a unipolar measure of downward comparison. Fourth, our measure of passive use on Snapchat was limited to two items and had poor internal consistency. Thus, future research should attempt to replicate these findings with more reliable and validated assessments of passive Snapchat use.

Implications.

This study increases our understanding of how different dimensions of narcissism relate to different types of SNS use and SNS behaviors. This knowledge can be used to understand how certain personality traits may cultivate a more positive or negative SNS experience. Given the immense popularity of SNSs, particularly among young people (Anderson & Jiang, 2018; Perrin & Anderson, 2019), it is critical to understand what types of experiences individuals have on SNSs. The observed findings suggest that those higher in vulnerability/narcissistic neuroticism may be susceptible to more maladaptive SNS experiences, such as

more frequent engagement in upward comparisons and feelings of exclusion. On the flip side, those higher in grandiosity/agentive extraversion may have more positive SNS experiences, such as greater engagement in downward comparisons. There is general consensus among researchers that SNSs are an optimal venue to engage in harmful, upward comparisons due to the highly positive content that others post online (Verduyn et al., 2017); however, our findings suggest that this experience may not be universal, depending on the characteristics of the SNS user. Additionally, those higher in grandiosity/agentive extraversion and entitlement/self-centered antagonism tended to engage in greater active use. Active use is speculated to be a positive process (e.g., increasing well-being; Verduyn et al., 2017), although this relation may be complex, depending on how others respond to this content (e.g., positive feedback through Likes, or negative feedback through negative comments). Thus, future research should examine the types of content that these individuals may post online, and what the effects of others' feedback may be, to better determine if active use is an adaptive or a maladaptive process.

These resulting effects of SNS use can be considered in the context of the dynamic relations between the different dimensions of narcissism. Back (2018) suggests that those higher in narcissism tend to default to behaviors that reflect a high level of social potency and self-promotion and that result in outcomes such as popularity and social interest. If these outcomes are not achieved, those higher in narcissism may engage in self-protection. For example, an individual may post something to Instagram, with the hope of obtaining a large amount of Likes and comments, which will feed his or her desire for popularity and social interest. If the desired amount of Likes and comments are not achieved, then an individual may engage in self-protection, such as by deleting the post. Thus, the social outcomes of different SNS behaviors may shape narcissistic tendencies over time, and future research should test these dynamic relations further.

Overall, these findings may have important implications for how people are influenced by SNS use, particularly in terms of their subjective well-being. Considering personality may be a key way to shed further light on the debate surrounding if SNSs are harmful or not to young people's well-being (e.g., Orben & Przybylski, 2019; Twenge & Campbell, 2019). Our findings suggest differential experiences with SNS use depending on individuals' levels of narcissistic traits, which in turn highlights the importance of considering personality traits when examining how these platforms may be affecting users.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Disclosures

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Highlights

- Grandiosity/agentic extraversion is associated with adaptive SNS use
- Vulnerability/narcissistic neuroticism is associated with maladaptive SNS use
- Entitlement/self-centered antagonism had weak associations with SNS use

Table 1.

Descriptive statistics for Study 1 variables.

	Mean	SD	Skew	Kurtosis
Grandiosity/AE	3.56	0.88	0.25	0.16
Entitlement/SCA	2.08	0.94	1.05	1.01
Vulnerability/NN	2.29	0.97	0.60	-0.15
Active Use	2.10	1.12	1.72	3.45
Passive Use	2.72	1.43	1.14	0.90
Down. Comparison	2.54	1.93	1.16	0.30
Upward Comparison	2.05	1.72	1.67	1.89
Perceived Exclusion	1.85	1.51	2.39	5.71

Note. AE=Agentic Extraversion. SCA=Self-centered Antagonism. NN=Narcissistic Neuroticism. Down=Downward.

Table 2.

Zero-order correlations and results of the tests of differences in dependent correlations for Study 1.

	Grandiosity/AE	Entitlement/SCA	Vulnerability/NN
Active Use	.25^a [.07, .41]	.16 ^a [−.03, .33]	.19 ^a [.00, .36]
Passive Use	.18 ^a [.00, .35]	.14 ^a [−.04, .32]	.25^a [.07, .41]
Downward Comparison	.34^a [.16, .49]	.31^a [.13, .46]	.34^a [.16, .49]
Upward Comparison	.14 ^a [−.05, .31]	.42^b [.25, .56]	.47^b [.32, .61]
Perceived Exclusion	.03 ^a [−.15, .22]	.37^b [.20, .51]	.48^b [.32, .61]

Note. AE=Agentic Extraversion. SCA=Self-centered Antagonism. NN=Narcissistic Neuroticism. Correlations significant at $p < .01$ are in bold. 95% Confidence Intervals for correlation coefficients are presented in brackets. Correlations that significantly differ from each other at $p < .01$ do not share a subscript.

Table 3.

Descriptive statistics for Study 2 variables.

	Mean	SD	Skew	Kurtosis
NSM				
Grandiosity	0.00	0.78	0.29	−0.01
Entitlement	0.00	0.79	0.56	0.07
Vulnerability	0.00	0.84	−0.04	−0.27
TMN				
Agentic Extraversion	0.00	0.82	0.16	−0.12
Self-Centered Antagonism	0.00	0.90	0.68	0.23
Narcissistic Neuroticism	0.00	0.93	0.01	−0.25
Facebook				
Active	1.83	0.91	1.55	2.95
Passive	2.71	1.17	0.66	−0.06
Downward Comparison	5.34	1.48	0.02	0.22
Upward Comparison	2.71	1.09	0.13	−0.78
Perceived Exclusion	2.38	0.76	0.21	−0.37
Instagram				
Active	2.78	1.27	0.74	0.13
Passive	4.18	1.41	−0.05	−0.56
Downward Comparison	5.17	1.70	0.16	−0.05
Upward Comparison	2.96	1.13	−0.13	−0.79
Perceived Exclusion	2.54	0.90	0.10	−0.63
Snapchat				
Active	3.72	1.61	0.33	−0.79
Passive	4.32	1.55	0.04	−0.75
Downward Comparison	5.74	1.60	−0.02	0.36
Upward Comparison	2.56	1.13	0.30	−0.77
Perceived Exclusion	2.63	0.94	0.05	−0.65

Table 4.

Zero-order correlations between narcissism scales and FFM traits for Study 2.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
1. FFI _N _Ext	--																				
2. NARQ_Adm	.60*	--																			
3. NPI_Lead	.55*	.46*	--																		
4. NGS	.55*	.63*	.53*	--																	
5. NPI_GE	.44*	.54*	.38*	.43*	--																
6. FFI _N _Antag	.45*	.46*	.37*	.59*	.35*	--															
7. NARQ_Riv	.25*	.43*	.17*	.36*	.28*	.62*	--														
8. PES	.39*	.54*	.30*	.56*	.37*	.62*	.48*	--													
9. NPI_EE	.29*	.33*	.36*	.30*	.34*	.48*	.40*	.37*	--												
10. FFI _N _Neur	-.02	-.07	-.29*	-.20*	-.03	-.03	.18*	.07	.06	--											
11. BPNL_Vul	.29*	.30*	.06	.23*	.20*	.49*	.51*	.42*	.36*	.52*	--										
12. HNS	.21*	.25*	.00	.20*	.17*	.42*	.47*	.40*	.27*	.48*	.64*	--									
13. FFI _N _Vul	.21*	.14*	-.06	.11*	.11*	.46*	.42*	.36*	.30*	.76*	.73*	.65*	--								
14. NSM_Gran	.80*	.83*	.75*	.81*	.72*	.57*	.38*	.55*	.41*	-.15*	.27*	.21*	.13*	--							
15. NSM_Ent	.43*	.56*	.38*	.57*	.43*	.86*	.79*	.78*	.72*	.09	.57*	.49*	.49*	.60*	--						
16. NSM_Vul	.19*	.19*	-.09	.09	.14*	.35*	.46*	.36*	.27*	.80*	.86*	.85*	.86*	.13*	.46*	--					
17. TMN_AE	.83*	.82*	.78*	.83*	.55*	.57*	.37*	.55*	.39*	-.18*	.27*	.20*	.12*	.98*	.59*	.12*	--				
18. TMN_SCA	.39*	.49*	.30*	.53*	.35*	.90*	.90*	.61*	.49*	.08	.56*	.49*	.49*	.53*	.92*	.45*	.52*	--			
19. TMN_NN	.27*	.24*	.00	.18*	.17*	.51*	.50*	.42*	.35*	.69*	.93*	.69*	.93*	.22*	.57*	.92*	.21*	.56*	--		
20. Extraversion	.40*	.35*	.45*	.31*	.39*	.15*	.01	.12*	.14*	-.24*	-.09	-.17*	-.19*	.49*	.13*	-.20*	.47*	.08	-.15*	--	
21. Antagonism	.03	.00	.07	.08	.06	.40*	.44*	.14*	.36*	.11*	.31*	.30*	.32*	.06	.43*	.29*	.06	.47*	.34*	-.13*	--
22. Neuroticism	-.14*	-.16*	.28*	-.26*	-.06	-.05	.11*	.01	.09	.56*	.34*	.36*	.49*	-.23*	.05	.50*	-.26*	.03	.45*	-.27*	.22*

Note. FFI_N_Ext=FFNI Extraversion scale. NARQ_Adm=NARQ Admiration scale. NPI_Lead=NPI Leadership/Authority scale. NGS=Narcissistic Grandiosity Scale. NPI_GE=NPI Grandiose Exhibitionism scale. FFI_N_Antag=FFNI Antagonism scale. NARQ_Riv=NARQ Rivalry scale. PES=Psychological Entitlement Scale. NPI_EE=NPI Exploitativeness/Entitlement scale. FFI_N_Neur=FFNI Neuroticism scale. BPNL_Vul=Brief PNI Vulnerability scale. HNS=Hypersensitive Narcissism Scale. FFI_N_Vul=FFNI Vulnerability scale. NSM_Gran=Narcissism Spectrum Model Grandiosity composite.

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NSM_Ent=Narcissism Spectrum Model Entitlement composite. NSM_Vul=Narcissism Spectrum Model Vulnerability composite. TMN_AE=Trifurcated Model of Narcissism Agentic Extraversion composite. TMN_SCA=Trifurcated Model of Narcissism Self-Centered Antagonism composite. TMN_NN=Trifurcated Model of Narcissism Narcissistic Neuroticism composite.

*
 $p<.01$.

Table 5.

Zero-order correlations and results of the tests of differences in dependent correlations for Study 2.

	Narcissism Spectrum Model Dimensions			Trifurcated Narcissism Model Dimensions			FFM Traits		
	G	Ent.	V	AE	SCA	NN	Ext.	A	N
Facebook									
Active	.12^{a, b} [.05, .20]	.10^a [.02, .18]	-.01 ^b [-.09, .06]	.12^a [.05, .20]	.09 ^a [.01, .16]	.02 ^a [-.06, .10]	.12^a [.04, .20]	-.03 ^a [-.10, .05]	-.03 ^a [-.11, .05]
Passive	.12^a [.04, .20]	.16^a [.08, .23]	.16^a [.09, .24]	.12^a [.05, .20]	.15^a [.08, .23]	.16^a [.09, .24]	.04 ^a [-.04, .12]	.03 ^a [-.05, .10]	.03 ^a [-.05, .11]
DC	.40^a [.33, .46]	.05 ^b [-.03, .13]	-.20 ^c [-.28, -.13]	.39^a [.32, .45]	.01 ^b [-.07, .09]	-.16 ^c [-.24, -.08]	.30^a [.23, .37]	-.16 ^b [-.24, -.08]	-.24 ^b [-.31, -.16]
UC	-.11 ^a [-.19, -.04]	.15^b [.07, .22]	.41^c [.34, .47]	-.11 ^a [-.19, -.03]	.17^b [.09, .24]	.38^c [.31, .44]	-.20 ^a [-.28, -.13]	.15^b [.08, .23]	.34^c [.27, .41]
Exc.	.00 ^a [-.08, .08]	.06 ^a [-.02, .14]	.23^b [.15, .30]	.02 ^a [-.05, .10]	.06 ^a [-.02, .14]	.21^b [.13, .28]	-.04 ^a [-.11, .04]	.09 ^{a, b} [.02, .17]	.16^b [.08, .23]
Instagram									
Active	.26^a [.19, .34]	.20^a [.12, .27]	.05 ^b [-.03, .13]	.25^a [.17, .32]	.17^{a, b} [.10, .25]	.09 ^b [.01, .17]	.24^a [.17, .32]	.01 ^b [-.06, .09]	-.04 ^b [-.12, .04]
Passive	.25^a [.17, .32]	.27^a [.19, .34]	.22^a [.14, .29]	.22^a [.14, .29]	.24^a [.16, .31]	.24^a [.16, .31]	.17^a [.09, .25]	.07 ^a [-.01, .15]	.03 ^a [-.05, .11]
DC	.33^a [.26, .40]	.09 ^b [.02, .17]	-.20 ^c [-.27, -.12]	.32^a [.25, .39]	.10 ^b [.02, .17]	-.18 ^c [-.26, -.10]	.28^a [.20, .35]	-.12 ^b [-.19, -.04]	-.28 ^c [-.35, -.21]
UC	-.02 ^a [-.10, .06]	.17^b [.09, .25]	.45^c [.39, .51]	-.03 ^a [-.11, .05]	.14^b [.06, .22]	.42^c [.36, .49]	-.16 ^a [-.23, -.08]	.14^b [.06, .21]	.36^c [.29, .43]
Exc.	.02 ^a [-.05, .10]	.08 ^a [.00, .16]	.26^b [.18, .33]	.03 ^a [-.04, .11]	.08 ^a [.00, .16]	.26^b [.18, .33]	-.06 ^a [-.14, .02]	.07 ^a [-.01, .15]	.23^b [.16, .30]
Snapchat									
Active	.30^a [.22, .37]	.20^b [.12, .27]	.05 ^c [-.03, .13]	.29^a [.21, .36]	.18^b [.10, .25]	.10 ^b [.02, .18]	.28^a [.20, .35]	.03 ^b [-.05, .11]	-.02 ^b [-.10, .06]
Passive	.20^a [.12, .27]	.18^a [.10, .26]	.15^a [.07, .22]	.18^a [.11, .26]	.15^a [.07, .23]	.18^a [.10, .26]	.09 ^a [.01, .17]	.00 ^a [-.08, .08]	.04 ^a [-.04, .12]
DC	.39^a [.32, .45]	.11^b [.03, .19]	-.11 ^c [-.18, -.03]	.38^a [.31, .44]	.09 ^b [.01, .17]	-.10 ^c [-.17, -.01]	.30^a [.22, .37]	-.12 ^b [-.20, -.04]	-.21 ^b [-.29, -.13]
UC	-.03 ^a [-.11, .05]	.20^b [.12, .27]	.47^c [.40, .53]	-.03 ^a [-.11, .05]	.16^b [.08, .24]	.45^c [.39, .52]	-.22 ^a [-.29, -.14]	.16^b [.08, .24]	.35^c [.27, .41]
Exc.	.05 ^a [-.03, .13]	.13^a [.05, .21]	.33^b [.25, .40]	.06 ^a [-.02, .14]	.11^a [.03, .19]	.31^b [.24, .38]	-.08 ^a [-.16, .00]	.09 ^b [.01, .17]	.20^b [.12, .27]

Note. G=Grandiosity. Ent.=Entitlement. V=Vulnerability. AE=Agentic Extraversion. SCA=Self-Centered Antagonism. NN=Narcissistic Neuroticism. Ext=Extraversion. A=Antagonism. N=Neuroticism. DC=Downward Comparison, UC=Upward Comparison, Exc.=Perceived Exclusion. Correlations significant at $p < .01$ are in bold. 95% Confidence Intervals for correlation coefficients are presented in brackets. Correlations that significantly differ from each other at $p < .01$ do not share a subscript.