Mirror or Megaphone?: How relationships between narcissism and social networking site use differ on Facebook and Twitter

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ABSTRACT

As research on the connection between narcissism and social networking site (SNS) use grows, definitions of SNS and measurements of their use continue to vary, leading to conflicting results. To improve understanding of the relationship between narcissism and SNS use, as well as the implications of differences in definition and measurement, we examine two ways of measuring Facebook and Twitter use by testing the hypothesis that SNS use is positively associated with narcissism. We also explore the relation between these types of SNS use and different components of narcissism within college students and general adult samples. Our findings suggest that for college students, posting on Twitter is associated with the Superiority component of narcissistic personality while Facebook posting is associated with the Exhibitionism component. Conversely, adults high in Superiority post on Facebook more rather than Twitter. For adults, Facebook and Twitter are both used more by those focused on their own appearances but not as a means of showing off, as is the case with college students. Given these differences, it is essential for future studies of SNS use and personality traits to distinguish between different types of SNS, different populations, and different types of use.

1. Introduction

There has been a dramatic rise in the use of social networking sites (SNS) such as Facebook and Twitter over the past several years. SNS currently account for nearly one quarter of the total time spent online, and almost 80% of Internet users report some SNS use (Comscore, 2011). These sites have become one of the primary venues in which people interact with one another, establish their identities and friendships, and influence peers. This has attracted considerable scholarly attention, much of it devoted to investigating relationships between psychological traits and the use of such sites. A growing number of these studies focus on how narcissism and behavior on SNS are related (Bergman, Fearrington, Davenport, & Bergman, 2011; Ong et al., 2011; Ryan & Xenos, 2011), surmising that such sites may be products of and/or contribute to a growing culture of self-centeredness, particularly among college students.

In fact, cross-temporal meta-analyses of narcissism and empathy levels among college students over the past three decades have found decreases in empathic concern (i.e., sympathy for the misfortunes of others) along with increases in narcissism (Konrath, O'Brien, & Hsing, 2011; Twenge, Konrath, Foster, Campbell, & Bushman, 2008). Though these trends pre-date the popularization of SNS, the rate of decline in empathic concern has accelerated since 2000 (Konrath, O'Brien, & Hsing, 2011), prompting researchers to speculate that the rise of SNS may have enabled narcissistic individuals to seek veneration on a grander scale than would otherwise be feasible (Konrath, O'Brien, & Hsing, 2011).

Narcissism is a complex construct and represents multiple traits, indicative of both healthy and unhealthy behaviors (Kubarych, Deary, & Austin, 2004) that may explain the motivations behind SNS use. Therefore, conceptualizing narcissism as just a single construct might cause us to misunderstand the ways in which SNS are used to satisfy various psychological needs. Research has in fact already begun to examine how unhealthy components of narcissistic personality relate to behavior on Facebook (Carpenter, 2012).

The current study pursues this line of research by investigating how both healthy and unhealthy components of narcissism inform Facebook and Twitter use. We proceed by first discussing narcissism and how it relates to SNS use. Treating all SNS as a single concept rather than differentiating among specific types of SNS such as Twitter and Facebook may elide important differences in motivations people have for using SNS. Therefore, key differences in the affordances of Facebook and Twitter relevant to narcissism research are then discussed, highlighting the ways in which the ob-

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served association between narcissism and SNS use may change depending on the type of SNS platform used and the behavior assessed.

2. Theory

2.1. Defining and measuring narcissism

Narcissism is typically characterized as a tendency to consider one's self to be better than others, to constantly seek veneration from others, and to engage in self-centered thinking and behavior (Campbell, Rudich, & Sedikides, 2002; Morf & Rhodewalt, 2001). As is common with personality constructs, narcissistic traits among the general population tend to occur along a continuum.

Several negative outcomes have been associated with higher levels of narcissism. Increases in narcissism represent a possible threat to young adults' emotional and psychological health. Narcissism is known to be associated with the use of personal interaction as a means for self-enhancement and self-promotion (Wallace & Baumeister, 2002), which can prevent individuals from forming long-term intimate relationships (Campbell, 1999; Campbell & Foster, 2002) and otherwise impairs individuals' abilities to form healthy interpersonal relationships (Khodabakhsh & Besharat, 2011; Ogrodniczuk, Piper, Joyce, Steinberg, & Duggal, 2009). There may be broader, societal costs to increases in narcissism as well. Individuals high in narcissism are more likely to react with aggressive behavior after being criticized (Bushman & Baumeister, 2002). They have also been shown to act in their best short-term interests to the detriment of the long-term interests of others when such interests conflict with one another (Campbell, Bush, Brunell, & Shelton, 2005). However, narcissism also has aspects associated with positive outcomes. It has been associated with high self-esteem, extraversion, openness to experience, and low anxiety and neuroticism (Emmons, 1984; Raskin, Novacek, & Hogan, 1991; Rhodewalt & Morf, 1995; Sedikides, Rudich, Gregg, Kumashiro, & Rusbult, 2004).

Narcissism can therefore be thought of as multi-dimensional in nature; within the broadly defined construct of narcissism there exist several discrete components of narcissistic behavior and thinking. The existence of multiple components of narcissism has been corroborated in several studies by using principal component analyses (Emmons, 1984; Kubarych et al., 2004; Raskin & Terry, 1988; Twenge & Campbell, 2009). Using Raskin and Terry's (1988) narcissism personality index (NPI) as the basis for exploratory analyses of the construct of narcissism, these analyses yielded several components including: Exhibitionism (i.e., showing off), Entitlement (i.e., believing that one deserves the best), Exploitativeness (i.e., taking advantage of others), Superiority (i.e., feeling better than others), Authority (i.e., feeling like a leader), Self-Sufficiency (i.e., valuing independence), and Vanity (i.e., focusing on one's appearance).

All components convey a sense of high self-valuation but relate to distinct feelings and behaviors. Some of these are considered indicative of healthy human initiative, whereas others are considered to be unhealthy (Kubarych et al., 2004). For example, Self-Sufficiency is correlated with traits that are viewed as positive, at least in Western societies, such as independence (Raskin & Terry, 1988). On the other hand, components such as Exploitativeness are considered unhealthy, correlating with traits considered to be negative such as Machiavellianism (McHoskey, 1995) and hostility (Raskin & Terry, 1988). Some components are neither particularly healthy nor unhealthy. Exhibitionism, for instance, does not involve anything as overtly harmful as manipulation of others or hostility but rather indicates extraversion and a lack of impulse control. Knowing how experiences associated with healthy and unhealthy

components of narcissism differ is essential to understanding the consequences of higher levels of narcissism, and studies often examine the emergence of such differential relationships (e.g., Moeller, Crocker, & Bushman, 2009; Reidy, Zeichner, Foster, & Martinez, 2008).

2.2. Narcissism and SNS use

Given that narcissism is associated with the use of personal interaction as a means for self-enhancement and self-promotion (Wallace & Baumeister, 2002), various attributes of SNS make them seem like an ideal tool for achieving these narcissistic goals. SNS offer users near complete control over self-presentations, making them a useful venue for the deployment of strategic interpersonal behaviors that narcissists use to construct and maintain a carefully considered self-image (Morf & Rhodewalt, 2001). They provide users with abundant ways to interact, whether in private or public, individually or collectively. Individuals who value their own thoughts, feelings, and experiences (collectively referred to hereafter as "self-expressions") highly and who anticipate others' high levels of interest in their self-expressions can publicize them to a wide audience. SNS allow users to dwell on past self-expressions as well as the popularity of those self-expressions manifested in various metrics such as "likes" or "shares" in the case of Facebook and "followers" or "re-tweets" in the case of Twitter. Facebook, in particular, can be an ideal tool for self-promotion as users can frequently post status updates, comments or photos of themselves and reasonably expect timely and frequent positive feedback. Moreover, given the rise of SNS use on mobile devices, SNS are accessible at all times and in all places. Narcissists need not wait until others are available to engage in self-aggrandizement, but can instead curate, manage, and promote an online "self" throughout the day.

Among studies of the relation between SNS use and narcissism, most point to a positive correlation between narcissism and amount of SNS use (e.g., Ryan & Xenos, 2011), even though the evidence remains somewhat mixed. Behaviors such as self-promotion through status updates (Mehdizadeh, 2010), descriptions of one's self, and photo posts (Bergman et al., 2011; Buffardi & Campbell, 2008; DeWall, Buffardi, Bonser, & Campbell, 2011; Mehdizadeh, 2010) are higher for users with higher levels of narcissism. Others have suggested positive associations between narcissism and measures of some quality or aspect of use by conducting linguistic analyses of profile pages (DeWall et al., 2011) and semiotic analyses of photos (Mendelson & Papacharissi, 2011).

However, results regarding time spent on SNS and frequency of status updates are inconclusive. Whereas one study found narcissism to be positively related to time spent on SNS and the number of times users logged on (Mehdizadeh, 2010), other studies have found no relationship between narcissism and time spent on the site (Bergman et al., 2011; Ryan & Xenos, 2011). A survey of adolescents from Singapore reported that after accounting for extraversion, narcissism predicted the frequency of Facebook status updates (Ong et al., 2011). No such relationship was found among American college students (Bergman et al., 2011) though, prompting the authors to contend that those high in narcissism do not appear to use SNS more often than those low in narcissism, but that their reasons for using SNS are different. People high in narcissism are driven to use SNS by the belief that others are interested in their activities and their desire for others to know about them.

Recent work has also begun to examine how the various components of the narcissistic personality relate to behavior on Facebook. A study of the aspects of narcissism that drive self-promoting and anti-social behavior on Facebook uses the two components indicative of unhealthy behavior from Ackerman et al., 2011 three-component conceptualization of narcissism: 'Grandi-

ose Exhibitionism' and 'Entitlement/Exploitativeness' (Carpenter, 2012). The Grandiose Exhibitionism component strongly predicted self-promoting behaviors including posting status updates and posting photos of one's self. The Entitlement/Exploitativeness component partially predicted anti-social behaviors. For example, it predicted behaviors such as responding to negative comments and trying to obtain more social support than offering, but did not predict anger stemming from not receiving comments on status updates.

It is necessary to continue exploring how components of narcissism are related to SNS use. In particular, using all available narcissism factors, rather than separating them into healthy and unhealthy components, can help to determine whether specific aspects of the narcissistic personality can predict specific behaviors on SNS. Moreover, it is also important to examine these relationships among different types of SNS such as Facebook and Twitter.

2.3. Distinguishing between Facebook and Twitter

Most of the studies cited above examined Facebook use, yet conclusions were often generalized to all SNS. It is important to consider the extent to which findings extend to other SNS, such as Twitter. While scholars seem to agree on the importance of studying the uses and effects of SNS, there is no consensus in the literature on the exact definition and inclusion criteria for SNS. Boyd and Ellison (2007) stipulate that SNS must allow users to create public or semi-public profiles, generate lists of individuals with whom they share a connection, and navigate these connections and those made by other users. Sites such as Facebook and MySpace clearly possess these attributes. Other iterations of online applications or websites such as many popular online virtual worlds or message boards, while fostering the formation of social connections online, do not allow users to maintain profiles as personal and as interactive as Facebook. Social blogging or micro-blogging sites such as Twitter fulfill Boyd and Ellison's SNS requirements. These sites are included in some analyses of the uses and impact of SNS (Huberman, Romero, & Wang, 2009; Hughes, Rowe, Batey, & Lee, 2012) but are excluded from many others (Livingstone, 2008). If scholars are to continue assessing the psychological and behavioral antecedents and effects of SNS use, it is essential to develop a clear understanding of the consequences of treating SNS as a category that encompasses social blogging or micro-blogging sites such as Twitter as well as the consequences of assuming that all SNS use is functionally equivalent.

Given the lack of clear definition of what SNS constitutes it is not surprising that there is also a lack of consensus regarding how to measure SNS use. Some researchers measure the amount of time spent using the site (Pasek, More, & Romer, 2009) while others have created aggregate measures that include items assessing users' perceived emotional connection to the site (Ellison, Steinfield, & Lampe, 2007; Valenzuela, Park, & Kee, 2009) or motives for use (Poon & Leung, 2011). Meanwhile, SNS such as Facebook increasingly offer users increasingly diverse ways to interact with each other; thus, measures of time spent on the sites capture a broader range of uses and experiences, diluting their explanatory power. It is therefore imperative to consider how time on SNS is used and the theoretical implications of assessing different aspects of use (Ryan & Xenos, 2011). The practical implications of these inconsistencies in definitions and measurements become clear when we consider their impact on the likelihood of finding a connection between SNS use and narcissism.

Users themselves tend to also differ systematically between sites on characteristics such as gender, race and education (Hargittai, 2007; Watkins, 2009). Bergman et al.'s (2011) respondents were asked if they used any SNS such as Facebook and Twitter, but their analysis did not distinguish between the two, even though their subsequent measures of SNS use accounted for uses related to Facebook (e.g., status updates, posting photos) but not Twitter. However, personality differences between Facebook and Twitter users exist, such that more sociable individuals gravitate toward Facebook while less sociable ones gravitate toward Twitter (Hughes et al., 2012). This suggests that the SNS may appeal to different types of individuals, but it does not indicate whether actual posting behavior – the behavior by which narcissistic individuals engage in self-promotion – is associated with personality differences.

When considering the psychological determinants of posting behavior on Twitter and Facebook, it is worth noting that Twitter differs from Facebook in certain functional ways. It may not be as good a tool for self-promotion as Facebook, as it limits the length of tweets to 140 characters and until recently did not allow users to directly post photos.[1] Also, Twitter allows users greater anonymity than Facebook, which may privilege the content of one's message over one's projected identity (Huberman et al., 2009). Thus, Twitter does not offer users the same degree of control over their self-presentations.

Studies of users' stated reasons for using Twitter confirm that it may be used not exclusively as a device for self-promotion but also as an information-gathering tool or a means of maintaining connections. Hargittai and Litt (2011) find that Twitter use was driven primarily by interest for entertainment news, celebrity news, and sports news. Evidence also suggests that the amount of time spent using Twitter is positively associated with a need for connection and that this relationship is mediated by the frequency with which Twitter users post or "tweet" (Chen, 2010).

2.4. Hypotheses and research questions

In the current study we examine the relationship between narcissism, Facebook use, and Twitter use. Given the evidence linking SNS use, typically operationalized as Facebook use, to narcissism and the differences in the affordances of Twitter and Facebook, we hypothesize that amount of use and posting frequency on Facebook will be positively associated with narcissism. The relationships between narcissism, the amount of Twitter use, and the frequency with which Twitter users post are examined through research questions.

RQ1: Is narcissism related to Twitter posting frequency?
H1: Narcissism is positively related to Facebook status posting frequency.
RQ2: Is narcissism related to amount of daily Twitter use?
H2: Narcissism is positively related to amount of daily Facebook use.

We also extend prior research on narcissism and SNS use by exploring which specific aspects of narcissism are associated with the above behaviors. As mentioned previously, narcissism has various components (Raskin & Terry, 1988) and might differentially predict different patterns of Facebook and Twitter use. If so, this would give us a better understanding of how different SNS fulfill different aspects of narcissism.

RQ3: How is Facebook use related to each of the six types of narcissism?
RQ4: How is Twitter use related to each of the six types of narcissism?

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[1] As of August 2011, Twitter allows users to post photos directly to the site. Data for this study was collected before this change.

Table 1
Descriptive statistics and correlations for Study 1 (college students).

	1	2	3	4	5	6	7	8	9	10	11	Mean	SD
1. Twitter use	–	.39**	.15	−.09	.08	.14	.16	.02	.07	−.001	−.04	24.06	38.56
2. Twitter posts		–	.13	.2~	.22*	.06	.2~	.13	.25*	.12	.17~	3.82	1.59
3. Facebook use			–	.16**	.06	.08	.07	−.003	.03	.04	.06	101.91	93.12
4. Facebook status posts				–	.09~	.2***	.04	.01	.06	.08~	−.008	3.8	1.49
5. Narcissism					–	.74***	.64***	.75***	.75***	.66***	.69***	3.97	.87
6. Exhibitionism						–	.35***	.48**	.41**	.47**	.32**	3.96	1.29
7. Entitlement							–	.38***	.33***	.33*	.46***	3.63	1.3
8. Exploitativeness								–	.46***	.44**	.36***	3.83	1.17
9. Superiority									–	.41***	.51***	4.22	1.23
10. Authority										–	.3***	4.19	1.22
11. Self-Sufficiency											–	3.94	1.1

Notes: Pearson Product-Moment correlations. Facebook/Twitter Use = visits per day × duration of visit. Narcissism is NPI-16 total.
~ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

3. Study 1 material and methods

3.1. Participants and procedure

Participants were undergraduate students at a large Midwestern university and received course credit for completing a media use and attitudes online survey. It was administered in the fall of 2010 and winter of 2011. Age, gender, narcissism and SNS use were similar across the two periods. Therefore, for purposes of analyses, data from these two periods were pooled together to form one data set consisting of 486 participants. The sample was primarily female (74%) and the median age was 19 ($M = 18.8$, $SD = .85$).

3.2. Measures

Previous research on SNS use includes measures of amount of time spent using SNS as well as composite measures of "intensity" (Ellison et al., 2007; Poon & Leung, 2011; Ryan & Xenos, 2011; Valenzuela et al., 2009). Such measures do not assess posting frequency as a single variable. Similarly, existing studies of Twitter use (Chen, 2010) do not differentiate between amount of use and posting frequency. Therefore, we developed measures of posting frequency to supplement existing measures of amount of use.

3.2.1. Daily Facebook and Twitter use

In order to determine the amount of time participants spent using Facebook and Twitter, we asked participants to report whether or not they used the sites. If they used the sites, they were asked to report how many times, on average, they visited the site per day. They were also asked to report the average duration of each visit. This yielded a single measure (*number of visits per day × duration of average visit*) for each user for Facebook and for Twitter (reported in total minutes per day). Nine participants used neither SNS and were excluded from the analysis.

3.2.2. Posting frequency

To determine the frequency with which participants posted status updates on Facebook, we provided participants with the following options: "never", "less than once a month", "once a month", "once a week", "2–3 a week", "daily", "more than once a day". To determine the frequency with which Twitter users posted, we provided users with the following six options: "never", "less than once a month", "once a month", "once a week", "daily", "more than once a day".

3.2.3. Narcissism

Narcissism was measured using the 16-item Narcissism Personality Inventory (NPI-16) (Ames, Rose, & Anderson, 2006). Each item pairs a narcissistic response with a non-narcissistic response (e.g., 1 = "I always know what I'm doing", and 7 = Sometimes I am not sure of what I am doing") and asks respondents to rate the extent to which these statements reflect themselves. The scale exhibits strong internal and discriminant validity in prior research (Ames et al., 2006). Values were recoded so '1' represented low narcissism and '7' represented high narcissism. We calculated an overall narcissism score ($\alpha = .85$) and also calculated scores for six subscales: Exhibitionism (3 items: $\alpha = .79$), Entitlement (2 items: $\alpha = .49$), Exploitativeness (3 items: $\alpha = .63$), Superiority (3 items: $\alpha = .75$), Authority (2 items: $\alpha = .67$), and Self-Sufficiency (3 items: $\alpha = .36$). Inter-factor correlations ranged from $r = .30$ between Authority and Self-Sufficiency to $r = .50$ between Superiority and Self-Sufficiency.

3.3. Analysis

The hypotheses were tested using four separate hierarchical regression analyses on the pooled data set. Gender[2] was controlled for in accordance with past research (Bergman et al., 2011; Campbell & Foster, 2002; Foster et al., 2003; Mehdizadeh, 2010; Ong et al., 2011) and the model also included a dummy variable representing the second wave of data collection. An initial analysis of responses to the free-response questions pertaining to the amount of Facebook and Twitter use revealed highly skewed distributions. Respondents who reported using more than 24 h of either of these media per day were removed from subsequent analysis. After removing these outliers, the distribution of both variables was still highly skewed and kurtotic.[3] A log transformation of both variables created variables with more normal distribution. Variables representing participants' levels of narcissism and the frequency with which they posted updates on Facebook and Twitter were normally distributed.

4. Results

4.1. Facebook and Twitter activity

Close to 98% of participants use Facebook and around 22% use Twitter. The mean amount of time spent using Facebook was

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[2] Age and race are known to be associated with narcissism (Foster, Campbell, & Twenge, 2003), however our sample exhibited little variance for both. Therefore, we did not include them as covariates in our analyses.

[3] Twitter minutes of use skewness statistic = 4.782, kurtotic statistic = 30.18; Facebook minutes of use skewness statistic = 2.36; kurtotic statistic = 7.81. A Kolmogorov-Smirnov test of normality for both variables yielded statistics of .27, $p < .05$ and .20, $p < .05$, respectively, indicating that the data in both variables are not normally distributed.

101.91 min per day (median = 75 min). This was very similar to findings of other researchers examining similar populations (e.g., 101.09 min; Junco, 2011). The mean amount of time spent using Twitter was 24 min (median = 10 min). Most respondents in our sample posted Facebook status updates 2–3 times per week (24%) or daily (29%). Among Twitter users, most respondents posted once a week (29%) or daily (23%).

4.2. Narcissism and SNS use

The intercorrelations, means and standard deviations of key independent and dependent variables are presented in Table 1. Our hypotheses were supported, as (H1) narcissism significantly predicted Facebook status updates, $t(423) = 1.99$, $p < .05$ and (H2) amount of daily use, $t(407) = 2.76$, $p < .01$, in the expected positive direction (Table 2). Regarding Twitter use, (RQ1) narcissism was found to also significantly predict Twitter posts, $t(91) = 2.15$, $p < .05$. However, it was not related to the daily amount of Twitter use (RQ2).

However, these effects appear to be driven by different narcissism subscales (Table 3). The subscale analysis demonstrates that with regard to time spent on SNS, there is a distinct relationship present for the amount of daily Facebook use, as it is associated Exhibitionism, $t(402) = 2.63$, $p < .01$, and Entitlement, $t(402) = 2.27$, $p < .05$, and to a lesser extent, negatively associated with Exploitativeness, $t(402) = -1.72$, $p < .1$. Time spent using Twitter exhibits a positive correlation of marginal significance with Entitlement, $t(78) = 1.83$, $p < .1$. Posting on Facebook is associated with Exhibitionism, $t(418) = 4.38$, $p < .001$), and exhibits a margin-

ally significant association with Exploitativeness, $t(418) = -1.71$, $p < .1$, whereas posting on Twitter exhibits a marginally significant association with Superiority, $t(86) = 1.9$, $p < .1$.

5. Discussion

The analyses provide evidence of a positive correlation between certain types of SNS use and certain types of narcissism, indicating that Facebook and Twitter, and the various ways of using them, may be used to fulfill different psychological needs. Spending time on Facebook and posting on Facebook may be a way to communicate one's best self to others and unobtrusively assess one's standing compared to others, as both behaviors are associated with Exhibitionism. The marginally significant associations between Facebook use/posting and Entitlement suggests that Facebook use is a means by which those who feel as though they "deserve everything" attempt to garner attention and positive feedback. Conversely, the linked between the frequency with which individuals post on Twitter and Superiority suggests that posting on Twitter is used as a way to demonstrate one's perceived superiority to others rather than as a means of self-promotion.

As with many studies of SNS use and narcissism, this study relied on a sample of college students. It is possible that college students differ significantly in the ways in which they use SNS from the majority of SNS users, who tend to be older than college age. To demonstrate the generalizability of the findings of Study 1 and to explore the ways in which the relationships between various types of SNS use and the aforementioned components of nar-

Table 2
How narcissism predicts Facebook and Twitter behavior among college students (Study 1).

	Facebook status posts		Facebook use		Twitter posts		Twitter use	
	β	t	β	t	β	t	β	t
Gender	−.01	−.16	−.23***	−4.63	−.03	−.29	−.1	−.92
Survey Wave	.01	.14	.07	1.47	.01	.07	−.11	−.97
Narcissism	.1*	1.99	.14**	2.76	.22*	2.15	.05	.49
N	427		411		95		87	
R^2	.01		.06		.05		.02	

Notes: Regression coefficients represent standardized betas. *Gender* is coded: female = 0, male = 1. *Survey Wave* is dummy coded: 0 = fall 2010, 1 = winter 2011.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3
How narcissism subscales predict Facebook and Twitter behavior among college students (Study 1).

	Facebook status posts		Facebook use		Twitter posts		Twitter use	
	β	t	β	t	β	t	β	t
Gender	−.001	−.03	−.23***	−4.69	.02	.2	−.08	−.66
Survey Wave	.01	.25	.09	1.86	.03	.26	−.09	−.8
Exhibitionism	.26***	4.38	.16**	2.63	−.1	−.76	.02	.15
Entitlement	−.08	−1.43	.13*	2.27	.19	1.53	.23~	1.83~
Exploitativeness	−.1~	−1.71	−.11~	−1.72	−.05	−.36	−.11	−.72
Superiority	.04	.59	−.01	−.08	.29~	1.9	.18	1.12
Authority	.04	.6	−.03	−.55	−.01	−.07	−.02	−.17
Self-Sufficiency	−.02	−.34	.06	1.08	−.01	−.05	−.21	−1.45
N	427		411		95		87	
R^2	.06		.09		.09		.07	

Notes: Regression coefficients represent standardized betas. *Gender* is coded: female = 0, male = 1. *Survey Wave* is dummy coded: 0 = fall 2010, 1 = winter 2011.
~ $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

cissism depend upon the age of the user, we conducted another study using a sample of adults.

6. Study 2 material and methods

6.1. Participants and procedure

Participants were 93 American adults who were recruited via MTURK (Buhrmester, Kwang, & Gosling, 2011) to complete an on-line survey for a small payment. The survey was programmed using Qualtrics. Participants were mostly White (79%) and female (58%), with an average age of 35.2 (SD = 12). Nearly half of the sample (42%) had no college degree.

6.2. Measures

6.2.1. Frequency of Facebook and Twitter use

We were unable to ask identical questions as in Study 1 because this survey was part of another, unrelated, study, and there was limited time available for extraneous questions. Thus, we did not directly ask how many minutes respondents spent on Facebook and Twitter. Instead, using rating scales, participants were asked to report how many times they checked Facebook and Twitter the day before ("none", "one", "two or three", "once an hour", once every 30 min", "once every 10 min", "more than once every 10 min"). These questions are not identical to the ones in Study 1, however, they do provide a general idea of participants' relative daily Facebook and Twitter use.

6.2.2. Posting frequency

Participants were asked how many times they posted on Face-book and Twitter each day. They were presented with the same se-ven options that were used for the measure of daily Facebook and Twitter use.

6.2.3. Narcissism

Narcissism was measured using the forced-choice 40-item Nar-cissism Personality Inventory (NPI-40; Raskin & Terry, 1988). Each item of the NPI-40 pairs a narcissistic response with a non-narcis-sistic response (e.g., "*I always know what I'm doing*" versus "*Some-times I am not sure of what I am doing*") and asks respondents to select the answer that best reflects themselves. Narcissistic re-sponses were scored as 1 and non-narcissistic responses were scored as 0. The NPI-40 yields seven subscales – Exhibitionism, Entitlement, Exploitativeness, Superiority, Authority, Self-Suffi-ciency, and Vanity – as opposed to the NPI-16 which yields six.

Sums were then calculated to reflect an overall narcissism score (α = .89) and its subscales: Exhibitionism (7 items: α = .76), Entitle-ment (6 items: α = .63), Exploitativeness (5 items: α = .60), Superi-ority (5 items: α = .65), Authority (8 items: α = .82), Self-Sufficiency (6 items: α = .54), and Vanity (3 items: α = .77). Inter-factor corre-lations ranged from r = .16 between Vanity and Exploitativeness to r = .61 between Superiority and Authority.

7. Results

The intercorrelations, means and standard deviations of key independent and dependent variables in the adult sample are pre-sented in Table 4. We used regression analyses to examine the rela-tionship between social network use and narcissism in a general adult sample. As in Study 1, all analyses controlled for gender. Two types of regressions were conducted. One regression exam-ined whether the frequency of Facebook checking and posting pre-dict narcissism and it subscales, and the other examined the predictive value of Twitter checking and posting. Results are pre-sented in Table 5. Facebook posting frequency is positively associ-ated with levels of narcissism, confirming H1 among an adult population. Facebook use as measured by checking frequency is not associated with overall narcissism. The positive association be-tween Twitter posting and overall narcissism is marginally signif-icant while there is no significant association between checking Twitter and narcissism.

Examination of the relationship between Facebook and Twitter posting behavior and the subscales of narcissism among the adult sample reveals a different pattern than that which was observed among the college student sample. Among adults, Facebook post-ing is associated with Vanity and exhibits a marginally significant positive association with Superiority and a marginally significant negative association with Authority. Twitter posting exhibits a marginally significant association with Vanity. Facebook checking was positively associated with Superiority and negatively associ-ated with Authority. Facebook checking also exhibited marginally significant positive associations with Vanity and Exploitativeness. Twitter checking was positively associated with Vanity only (see Table 6).

8. Discussion

The results of the second study suggest that the connection be-tween narcissism and posting behavior on Twitter and Facebook exists in the larger adult population of SNS users. Overall, the adult sample exhibits greater consistency across the narcissism sub-

Table 4
Descriptive statistics and correlations for Study 2 (adults).

	1	2	3	4	5	6	7	8	9	10	11	12	Mean	SD
1. Checked Twitter	–	.67	.30	.23	.15	.11	.03	.09	.13	.16	.24	.06	1.35	0.92
2. Posted on Twitter		–	.23*	.40**	.27**	.15	.14	.22*	.23*	.20*	.26**	.19~	1.19	0.81
3. Checked Facebook			–	.63**	.20~	.01	.16	.29**	.20~	.20~	.25*	.02	2.86	1.67
4. Posted on Facebook				–	.34**	.12	.25*	.32**	.33**	.26**	.34**	.18~	1.77	1.18
5. Narcissism					–	.83**	.65**	.78**	.76**	.67**	.50**	.70**	12.06	8.07
6. Authority						–	.42**	.61**	.51**	.50**	.25*	.55**	3.20	2.54
7. Self sufficiency							–	.48**	.29**	.40**	.26**	.35**	2.38	1.59
8. Superiority								–	.56**	.39**	.31**	.45**	1.75	1.51
9. Exhibitionism									–	.50**	.53**	.46**	1.09	1.61
10. Exploitativeness										–	.16	.38**	1.40	1.38
11. Vanity											–	.24*	0.76	1.08
12. Entitlement												–	1.48	1.51

Notes: Pearson Product-Moment correlations. Narcissism is NPI-40 total.
~ *p* < .10.
* *p* < .05.
** *p* < .10.

Table 5
How narcissism predicts Facebook and Twitter behavior among adults (Study 2).

	Facebook posting		Facebook checking		Twitter posting		Twitter checking	
	β	t	β	t	β	t	β	t
Gender	−.1	−.97	−.14	−1.33	.05	.47	.13	.12
Narcissism	.35**	3.46	.22*	2.06	.26*	2.45	.16	1.5
N	92		92		92		92	
R^2	.12		.06		.07		.03	

Notes: Regression coefficients represent standardized betas. *Gender* is coded: female = 0, male = 1.
$^\sim p < .10.$
$^* \ p < .05.$
$^{**} \ p < .01.$

Table 6
How narcissism subscales predict Facebook and Twitter behavior among adults (Study 2).

	Facebook posting		Facebook checking		Twitter posting		Twitter checking	
	β	t	β	t	β	t	β	t
Gender	−.05	−.44	−.04	−.36	.07	.58	.01	.09
Exhibitionism	.07	.49	−.06	−.37	−.03	−.2	−.11	−.7
Entitlement	.05	.4	−.10	−.8	.07	.52	−.03	−.2
Exploitativeness	.19	1.52	.23$^\sim$	1.82	.15	1.12	.20	1.52
Superiority	.23$^\sim$	1.62	.41**	2.81	.15	1	.02	.11
Authority	−.26$^\sim$	−1.85	−.30*	−2.11	−.10	−.64	.03	.21
Self-Sufficiency	.07	.59	−.02	−.18	−.03	−.24	−.09	−.69
Vanity	.24*	2.04	.22$^\sim$	1.83	.22$^\sim$	1.77	.29*	2.28
N	92		92		92		92	
R^2	.22		.2		.16		.09	

Notes: Regression coefficients represent standardized betas. *Gender* is coded: female = 0, male = 1.
$^\sim \ p < .10.$
$^* \ \ p < .05.$
$^{**} \ p < .01.$

scales than the college student sample. These findings can help us to better understand the differences between the two SNS applications with regards to their use to achieve the goals of college students and adults who are high in narcissism.

Differences in associations between the subscales and SNS posting behavior in the student and adult samples suggest that there is more to be learned about the connections between SNS and various types of narcissism by sampling non-college students. For adults high in narcissism, social media seems to be used primarily as a means of intensely focusing on one's own appearance. Adults' use of Facebook, in particular, suggests that Facebook is of less use to particular kinds of narcissists: narcissists who consider themselves to be leaders. For adults who are high in narcissism, Facebook appears to be more useful as a means of conveying one's superiority, while Twitter appears to serve this same function for college students who are high in narcissism. Future work should not assume that college students who score high in particular types of narcissism and their adult counterparts use SNS in precisely the same way to boost their egos and control others' perceptions of them.

9. General discussion

Our goals were to examine the relationship between narcissism and SNS use by differentiating between types of SNS, ways of measuring use, and types of narcissism. Results from these two studies show some differences in the ways that those scoring high on narcissism behave across sites, suggesting that researchers interested in the relationship of narcissism to SNS use should differentiate between Twitter and Facebook use. Twitter appears to be used by college students who are high in narcissism as a

kind of technologically augmented megaphone: a means of amplifying one's own perceived superiority to others. Evidence from Study 2 suggests that adults seeking to convey this sense of superiority turn to Facebook instead of Twitter. Facebook's use by both college students and adults who are high in narcissism is more analogous to the use of a technologically enhanced mirror, reflecting a pre-occupation with one's own image, others' reactions to this image, and a desire to update the image as frequently as possible. Together, findings from the two studies indicate that affordances of these two SNS alone do not determine their utility to all users, but that individual factors such as age and personality type play a role in determining individuals' SNS use behaviors. Regarding the discrepancies among past studies of these relationships, our results agree with work finding narcissism to be positively related to the frequency of posts (Ong et al., 2011). Facebook status updates and Twitter posts increased as narcissism rose.

Facebook posting frequency was also linked to higher levels of Exhibitionism in college students but not in adults. This is inconsistent with previous findings (Carpenter, 2012) in which heavy Facebook users scored high in the "Grandiose Exhibitionism" aspect of narcissism. Though Carpenter operationalizes Facebook use in a different way than we do, our use of two different measures of Facebook use – posting and frequency of use – provides robust evidence that the relationship between Exhibitionism and Facebook use is not the same across age groups. Carpenter's sample had a lower mean age (23.3) than the mean age of the adult sample used in our second study (35.2). This discrepancy suggests that we should qualify the assumption that narcissists post on Facebook as a means of self-promotion and showing off by indicating that such a relationship has only been demonstrated in college or young-adult populations.

Though both Twitter and Facebook posting correlated with narcissism, the *amount* of daily SNS use differed in its relationship to narcissism among college students. More narcissistic Facebook users in this sample spend more time on the site, while narcissism has no relationship with time spent on Twitter. The discrepancy between posting and amount of use across sites is important. It implies that there are Twitter users who spend considerable time on the site yet are not using it to promote themselves but rather, could be using it to gather information, as suggested by Hargittai and Litt (2011). This may also explain why Twitter users and non-users do not differ in their levels of narcissism. The reasons that people use Twitter are therefore important and further research in this area is clearly needed.

Although Facebook has more avenues for feedback and interaction, which are ultimately what those scoring high on narcissism use to confirm their self-centered adoration (Bergman et al., 2011; Campbell et al., 2002), the difference in the audiences associated with Facebook and Twitter might explain why increased posting on Twitter appeals to them. Facebook users tend to 'friend' people they know in real life, whereas Twitter 'followers' often belong to a more general public. While this difference does not hold true for all Facebook and Twitter users because one can set a preferred level of privacy for both sites, the default settings of each site create a set of norms that influence the size and type of a user's audience. The potential for a larger, less familiar audience could motivate more narcissistic users to post more frequently on Twitter.

9.1. Strengths, limitations, and conclusion

Two strengths of these studies are that we examine Facebook and Twitter behaviors separately, and do so across two different populations, whereas many studies collapse across different types of social networking sites, and rely on college student samples. However, several limitations should be mentioned. First, the nature of self-report measures of SNS use, like all self-report measures of media use, are subject to memory errors (e.g., over-estimating or underestimating total amounts of use). Confirmatory analyses should use real-time measures of use, such as diary methods of recording activities throughout the day.

Second, we do not take into account the content of SNS users' posts. It is expected that greater frequency of posts related to one's own accomplishments, thoughts, or feelings would be indicative of narcissism while posts related to news events would not. Assessing the content of SNS posts presents technical and privacy-related challenges for communications researchers. However, studies that take into account the content of SNS users' posts are not without precedent (e.g., Carr, Schrock, & Dauterman, 2012; Zhao, Grasmuck, & Martin, 2008). Researchers of the connection between posting behavior on SNS and narcissism should make an effort to take post contents into account in future analyses.

The overall fits of our regression models are comparable to those of other studies on narcissism and Facebook behavior. In models in which narcissism or its subscales had a statistically significant relationship with Facebook behavior, the R^2 value ranged from .04 to .18 in Carpenter (2012) and was .09 in Ong et al. (2011). In the current study, the R^2 values of models with statistically significant relationships ranged from .01 to .22. It should also be acknowledged that the low reliability of several subscales (e.g., Self-Sufficiency in Study 1, α = .36) may have attenuated observed associations between narcissism subscales and SNS use. Further refinement of the subscale measurements may improve reliability and, in turn, improve our ability to accurately assess these associations.

Finally, given the correlational nature of the study design, we cannot determine whether narcissism leads to increased SNS use,

whether SNS use promotes narcissism, or whether some third variable (other than gender) best explains the relationship. Future studies of the psychological determinants of SNS use should continue to distinguish between the various kinds of sites by identifying the absence or presence of various characteristics, such as the extent to which posts are intended for public or semi-public audiences (Boyd & Ellison, 2007). Furthermore, attention should be paid to the different ways in which SNS use is assessed, as past studies differ considerably in how time spent, activity, and reasons for use are measured. Finally, we recommend that future studies use experimental methods to examine the extent to which certain SNS behaviors can activate a narcissistic self-focus within individuals (Freeman & Twenge, 2010). Understanding the consequences of such methodological differences can help us to develop a clearer understanding of whether or not certain kinds of SNS use are associated with various psychological characteristics, and why those associations exist. As the number and diversity of SNS continue to grow, it is essential that theorists and researchers seeking to understand the psychological antecedents and consequences of their use begin to parse differences in affordances and uses of the sites. These studies represent a first step in this important process.

Disclosure statement

Acknowledgment

References

Ackerman, R. A., Witt, E. A., Donnellan, M. B., Trzesniewski, K. H., Robins, R. W., & Kashy, D. A. (2011). What does the Narcissistic Personality Inventory really measure? *Assessment, 18*, 67–87.

Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality, 40*, 440–450.

Bergman, S. M., Fearrington, M. E., Davenport, S. W., & Bergman, J. Z. (2011). Millennials, narcissism, and social networking: What narcissists do on social networking sites and why. *Personality and Individual Differences, 50*, 706–711.

Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication, 13*, 210–230.

Buffardi, L. E., & Campbell, W. K. (2008). Narcissism and social networking web sites. *Personality and Social Psychology Bulletin, 34*, 1303–1314.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's mechanical turk. *Perspectives on Psychological Science, 6*(1), 3–5.

Bushman, B. J., & Baumeister, R. F. (2002). Does self-love or self-hate lead to violence? *Journal of Research in Personality, 36*, 543–545.

Campbell, W. K. (1999). Narcissism and romantic attraction. *Journal of Personality and Social Psychology, 77*, 1254–1270.

Campbell, W. K., Bush, C. P., Brunell, A. B., & Shelton, J. (2005). Understanding the social costs of narcissism: The case of the tragedy of the commons. *Personality and Social Psychology Bulletin, 31*(10), 1358–1368.

Campbell, W. K., & Foster, C. A. (2002). Narcissism and commitment in romantic relationships: An investment model analysis. *Personality and Social Psychology Bulletin, 28*, 484–495.

Campbell, W. K., Rudich, E. A., & Sedikides, C. (2002). Narcissism, self-esteem, and the positivity of self-views: Two portraits of self-love. *Personality and Social Psychology Bulletin, 28*, 358–368.

Carpenter, C. J. (2012). Narcissism on Facebook: Self-promotional and anti-social behavior. *Personality and Individual Differences, 52*, 482–486.

Carr, C. T., Schrock, D. B., & Dauterman, P. (2012). Speech acts within Facebook status messages. *Journal of Language and Social Psychology, 31*(2), 176–196.

Chen, G. M. (2010). Tweet this: A uses and gratifications perspective on how active Twitter use gratifies a need to connect with others. *Computers in Human Behavior, 27*, 755–762.

Comscore (2011). It's a social world: Top 10 need-to-knows about social networking and where it's headed. <http://www.comscore.com/it_is_a_social_world>.

DeWall, C. N., Buffardi, L. E., Bonser, I., & Campbell, W. K. (2011). Narcissism and implicit attention seeking: Evidence from linguistic analyses of social

networking and online presentation. *Personality and Individual Differences, 51*, 57–62.

Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students use of online social network sites. *Journal of Computer-Mediated Communication, 12*, 1143–1168.

Emmons, R. A. (1984). Factor analysis and construct validity of the Narcissistic Personality Inventory. *Journal of Personality Assessment, 48*, 291–300.

Foster, J. D., Campbell, W. K., & Twenge, J. M. (2003). Individual differences in narcissism: Inflated self-views across the lifespan and around the world. *Journal of Research in Personality, 37*, 469–486.

Freeman, E., & Twenge, J. (2010). Using MySpace increases the endorsement of narcissistic personality traits. Paper presented at the Society for Personality and Social Psychology 2010.

Hargittai, E. (2007). Whose space? Differences among users and non-users of social network sites. *Journal of Computer-Mediated Communication, 13*, 276–297.

Hargittai, E., & Litt, E. (2011). The tweet smell of celebrity success: Explaining variation in Twitter adoption among a diverse group of young adults. *New Media & Society, 13*, 824–842.

Huberman, B. A., Romero, D. M., & Wang, F. (2009). Social networks that matter: Twitter under the microscope. *First Monday*, 14.

Hughes, D. J., Rowe, M., Batey, M., & Lee, A. (2012). A tale of two sites: Twitter vs. Facebook and the personality predictors of social media usage. *Computers in Human Behavior, 28*(2), 561–569.

Junco, R. (2011). Too much face and not enough books: The relationship between multiple indices of Facebook use and academic performance. *Computers and Human Behavior, 28*(1), 187–198.

Khodabakhsh, M. R., & Besharat, M. A. (2011). Mediation effect of narcissism on the relationship between empathy and the quality of interpersonal relationships. *Procedia-Social and Behavioral Sciences, 30*, 902–906.

Konrath, S. H., O'Brien, E. H., & Hsing, C. (2011). Changes in dispositional empathy in American college students over time: A meta-analysis. *Personality and Social Psychology Review, 15*(2), 180–198.

Kubarych, T. S., Deary, I. J., & Austin, E. J. (2004). The narcissistic personality inventory: Factor structure in a non-clinical sample. *Personality and individual differences, 36*(4), 857–872.

Livingstone, S. (2008). Taking risky opportunities in youthful content creation: Teenagers' use of social networking sites for intimacy, privacy, and self-expression. *New Media & Society, 10*, 393–411.

McHoskey, J. (1995). Narcissism and machiavellianism. *Psychological Reports, 77*, 755–759.

Mehdizadeh, S. (2010). Self-presentation 2.0: Narcissism and self-esteem on Facebook. *Cyberspychology, Behavior, and Social Networking, 13*, 357–364.

Mendelson, A. L., & Papacharissi, Z. (2011). Look at us: Collective narcissism in college student Facebook photo galleries. In Z. Papacharissi (Ed.), *The networked self: Identity, community and culture on social network sites* (pp. 251–273). London: Routledge.

Moeller, S. J., Crocker, J., & Bushman, B. J. (2009). Creating hostility and conflict: Effects of entitlement and self-image goals. *Journal of Experimental Social Psychology, 45*(2), 448–452.

Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self-regulatory processing model. *Psychological Inquiry, 12*, 177–196.

Ogrodniczuk, J. S., Piper, W. E., Joyce, A. S., Steinberg, P. I., & Duggal, S. (2009). Interpersonal problems associated with narcissism among psychiatric outpatients. *Journal of Psychiatric Research, 43*(9), 837–842.

Ong, E. Y. L., Ang, R. P., Ho, J. C. M., Lim, J. C. Y., Goh, D. H., Lee, C. S., et al. (2011). Narcissism, extraversion and adolescents' self-presentation on Facebook. *Personality and Individual Differences, 50*, 180–185.

Pasek, J., More, E., & Romer, D. (2009). Realizing the social internet? Online social networking meets offline civic engagement. *Journal of Information Technology & Politics, 3–4*, 197–215.

Poon, D. C. H., & Leung, L. (2011). Effects of narcissism, leisure boredom, and gratifications sought on user-generated content among net-generation users. *International Journal of Cyber Behavior, Psychology and Learning, 3*, 1–14.

Raskin, R., Novacek, J., & Hogan, R. (1991). Narcissistic self-esteem management. *Journal of Personality and Social Psychology, 60*, 911–918.

Raskin, R., & Terry, H. (1988). A principal-components analysis of the Narcissistic Personality Inventory and further evidence of its construct validity. *Journal of Personality and Social Psychology, 54*, 890–902.

Reidy, D. E., Zeichner, A., Foster, J. D., & Martinez, M. A. (2008). Effects of narcissistic entitlement and exploitativeness on human physical aggression. *Personality and Individual Differences, 44*(4), 865–875.

Rhodewalt, F., & Morf, C. C. (1995). Self and interpersonal correlates of the Narcissistic Personality Inventory: A review and new findings. *Journal of Research in Personality, 29*, 1–23.

Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the Big Five, shyness, narcissism, loneliness, and Facebook usage. *Computers in Human Behavior, 27*, 1658–1664.

Sedikides, C., Rudich, E. A., Gregg, A. P., Kumashiro, M., & Rusbult, C. (2004). Are normal narcissists psychologically healthy?: Self-esteem matters. *Journal of Personality and Social Psychology, 87*, 400–416.

Twenge, J. M., & Campbell, W. K. (2009). *The narcissism epidemic: Living in the age of entitlement*. New York: Free Press.

Twenge, J. M., Konrath, S., Foster, J. D., Campbell, W. K., & Bushman, B. J. (2008). Egos inflating over time: A cross-temporal meta-analysis of the narcissistic personality inventory. *Journal of Personality, 76*(4), 875–902.

Valenzuela, S., Park, N., & Kee, K. F. (2009). Is there social capital in a social network site?: Facebook use and college students' life satisfaction, trust, and participation. *Journal of Computer-Mediated Communication, 14*, 875–901.

Wallace, H. M., & Baumeister, R. F. (2002). The performance of narcissists rises and falls with perceived opportunity for glory. *Journal of Personality and Social Psychology, 82*, 819–834.

Watkins, S. C. (2009). *The young and the digital: What the migration to social network sites, games, and anytime, anywhere media means for our future*. Boston, MA: Beacon Press.

Zhao, S., Grasmuck, S., & Martin, J. (2008). Identity construction on Facebook: Digital empowerment in anchored relationships. *Computers in Human Behavior, 24*(5), 1816–1836.