It's all about me (or us): Facebook post frequency and focus as they relate to narcissism

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Research on associations between narcissism and social media use has produced mixed results. This is, in part, due to the variety of ways in which social media use has been measured. In the present study of narcissism and self-expression via social media, a new measure of social media posting frequency is used as well as a content analysis of users' (N = 380) Facebook status updates that distinguishes between messages that focus attention exclusively on the user and messages that include other users at the center of attention. A positive association is found between narcissism and posting frequency as well as a negative association between narcissism and posting other-focused messages. This is the first study to find evidence of a link between narcissism and the focus of social media posts, furthering understanding of the psychological underpinnings of various types of online self-expression.

Keywords: social media, Facebook, narcissism, social networking sites, content analysis

Social media represent a promising venue in which to study relationships between types of self-expression and psychological traits. A prime example of this can be found in the research showing evidence of a link between social media use and narcissism (e.g., Carpenter, 2012). For the most part, this research supports the common belief that social media provide narcissists with an ideal platform for self-expression and self-promotion. However, extant research on this topic possesses several methodological limitations. Measuring duration or frequency of use, as many of these studies have, reveals little about qualities of self-expression on social media. Measuring users' stated reasons for using social media (e.g., Quan-Haase & Young, 2010) helps shed light on users' motivations and their relationship to narcissism, but leaves the precise nature of the self-expressions opaque.

In this study, these methodological limitations are addressed by the introduction of a means by which common modes of self-expression via social media may be identified.

Two characteristics of Facebook users' status posts are analyzed: (a) whether the post is an initiation of an interpersonal interaction or a report of the user's thoughts, feelings, or behaviors; (b) the focus of the message (i.e., who or what the message is about). Associations between trait levels of narcissism and the frequencies with which users post these types of posts are examined. In addition, a new measure of message posting frequency is introduced so as to resolve inconsistencies in research on the link between the frequency of status update posting on social media and levels of narcissism (Deters, Mehl, & Eid, 2014; Ong et al., 2011; Panek, Nardis, & Konrath, 2013; Winter et al., 2014). In doing so, the present study is among the first to provide evidence of a link between narcissism and characteristics of the *content* of social media posts. It also demonstrates the utility of a content analysis approach to understanding the psychological correlates and social function of social media use.

LITERATURE REVIEW
Frequency of Posting on Social Media

When distinguishing among types of social media use, many researchers ask participants to report the extent to which statements describe their social media use and/or the frequency with which they engage in social media use with each particular gratification in mind (e.g., Quan-Haase & Young, 2010). In other studies (McKinney, Kelly, & Duran, 2012; Ryan & Xenos, 2011), "type of use" is conceptualized as a precise behavior such as the use of a particular feature of a social network site (e.g., status updates, photo or video posts). A particularly relevant example of such a study is Alloway et al.'s (2014) investigation of links between narcissism and the frequency with which individuals used several Facebook features such as the one-to-one chat feature or the status post. They find narcissism to be positively associated to commenting posting frequency and, among female users, status posting and link sharing frequency.

These methods of measuring social media uses have limitations. First, it is not known whether participants understand concepts employed in "gratifications-sought" survey studies in precisely the way that researchers do. Even if respondents understand the concepts and categories with which they are presented, they may not be able to objectively evaluate the extent to which their social media use fit these categories. Such

measures are not assessing frequency or qualities of particular kinds of media use but rather some combination of users' evaluations of their own use and estimates of its frequency.

Both the aforementioned measures are potentially affected by users' abilities to accurately recall the frequency of use. There is evidence suggesting that unaided recall measures of social media use are especially inaccurate (Junco, 2013). There are methods of measuring types of social media use behavior that overcome the limitations of unaided recall frequency measures. Measures using guided prompts instructing participants to log into their social media accounts and report precisely how frequently they post are less susceptible to improper interpretation of concepts or failure to accurately recall behavior.

The measure used by Deters et al.'s study (2014) of narcissism and status posting frequency possesses another shortcoming that may have yielded misleading results. Researchers gained access to users' Facebook accounts and examined posts across a six week period. This truncated the true frequency distribution of posts, as many users within the study's sample did not post during the six week period. The lowest value, zero, was the modal value in the distribution, which is indicative of a "floor effect." It is likely that within the group of users who did not post in the six weeks prior to the study, some posted more frequently than others.

In the present study, posting frequency is assessed with a new measure designed to reduce the probability of memory bias and truncation bias. By asking users to log into their accounts and report the precise dates on which they posted, the likelihood that participants will misrepresent the frequencies with which they post on social media can be lessened. These reported posting dates can be used to calculate the average time elapsed between status posts for each user; the less time that elapses between posts, the more frequently a user posts. Asking users to report the dates of their previous eight posts assures a more accurate reflection of the true posting frequency distribution within the sample.

H1: The average time between users' status posts will be negatively related to levels of narcissism.

Though the frequency with which individuals post status updates provides researchers with some level of detail regarding the manner in which individuals use Facebook to express themselves, it divulges little of what users choose to express. Use of particular social media features, such as the status update, has become so commonplace and allows for such a diverse array of expressions that measures of use frequency lack the explanatory power that is necessary to understanding the psychological underpinnings of social media use. To address this limitation, some researchers ask users to report the frequency with which they post about certain topics (e.g., Marshall, Lefringhausen, & Ferenczi, 2015), a self-report measure that is susceptible to recall bias. As an alternative, other researchers have turned to content analysis.

Content Analyses of Social Media and Narcissism

Previous research on the linguistic markers of narcissism in everyday conversation has produced mixed results. While Raskin & Shaw (1988) observed a connection between narcissism and a linguistic marker of self-centeredness - the use of first-person singular pronouns in monologues - subsequent attempts to replicate the findings found no such correlation (e.g., Fast & Funder, 2008). It comes as little surprise, then, that content analyses of narcissists' self-expressions on social media found no correlation between narcissism and the use of first-person singular pronouns (Carey et al., 2015; Holtzman, Vazire, & Mehl, 2010).

Part of researchers' failure to find linguistic correlates to narcissism is a consequence of their reliance on automated linguistic analysis techniques. Software programs such as Linguistic Inquiry and Word Count (LIWC) count particular words or phrases. However, in social media expressions, statements focusing readers' attention on the user's unique thoughts, feelings, or behavior often employ an *implied* first person perspective (e.g., "had a terrific lunch today") which would not be identified by automated linguistic analyses. To identify self-focused social media posts, a categorization scheme was developed that relies on the as-yet-unautomated ability of humans to understand whether or not a message focuses exclusively on the thoughts, feelings, or behavior of the message poster.

Though social media features such as the status update, by virtue of the fact that they communicate individuals' expressions to an audience, may seem to allow users few alternatives to posts focusing readers' attention on the message posters, users often post messages that do not focus exclusively on themselves. Users post messages that include mentions of friends, family, or other "familiar others" who are likely to read the posts (Humphreys, Gill, Krishnamurthy, & Newbury, 2013). In such cases, users are, in effect, "sharing the spotlight" with others. The primary goal in the present content analysis is to differentiate between posts that focus the readers' attention exclusively on the user and those that do not.

Aside from the self-evident connection between self-focused social media posts and self-centeredness, there is experimental evidence to support an association between the two. Chiou, Chen, and Liao (2014) found that individuals who were prompted to post about their daily activities were less likely to subsequently help others with a task and that this effect was mediated by an egocentric mental state, suggesting that posting about one's activities can cause individuals to be more egocentric (at least temporarily).

Though social media researchers have found links between narcissism and self-*promoting* information (Buffardi & Campbell, 2008; Winter et al., 2014) as well as narcissism and posting about particular topics (e.g., dieting and exercise; Marshall et al., 2015), no research to date has assessed the link between narcissism and the *focus* of status posts. Based on this prior research, the following hypothesis is proposed:

H2: Narcissism will be positively correlated with the proportion of Facebook users' status posts that are self-focused reports of thoughts, feelings, or behavior.

Users also use social media to publicly communicate directly with others, directing exhortations (e.g., "great job, Sally!") or inquiries (e.g., "does anyone know of a good mechanic in the area?") to readers. In such cases, the message posting feature functions as a means of initiating interpersonal interaction rather than a means of reporting information. By virtue of the fact that users engaging in such posting behavior are forgoing the opportunity to report their thoughts, feelings, or behaviors, this posting behavior may be indicative of a generally outward, other-focused character rather than a self-focused, narcissistic character.

It is expected that the act of forgoing an opportunity for self-promotion and, instead, explicitly acknowledging readers through directed messages is indicative of a tendency to think less about one's self. We apply this reasoning to the development of the following hypothesis:

H3: Narcissism will be negatively correlated with the proportion of Facebook users' status posts that are directed to other users.

In addition to self-focused posts and posts directed to other users, there are messages that are reports of experiences that include references to individuals likely to be reading the messages, i.e., familiar others. Such messages include one or some of the readers as the implied center of attention. The prevalence of such posts may be indicative of a willingness to "share the spotlight," and thus would be likely be negatively associated with narcissism. Alternatively, such posts could be construed as maintaining focus on the user, not as an isolated individual offering observations but as a "social self" possessing the desirable trait of popularity that they are keen to exhibit. Donath and boyd (2004) characterize this type of social media use as "public displays of connection" that "may be a deliberate ploy to impress the listener" (p. 72). Consistent with this reasoning, there is evidence that narcissism is positively associated with the prevalence of references to friends in everyday conversation (Holtzman et al., 2010). Given these conflicting perspectives, it is not clear how "other-focused" messages will relate to narcissism. Thus, the relationship between narcissism and "other-focused" report messages is explored in the form of a research question.

RQ1: Will narcissism be correlated with the proportion of Facebook users' status posts that are other-focused reports of thoughts, feelings, or behavior?

METHODS
Participants and Procedure

Participants were recruited from the Communication Studies participant pool of a large American university. Students were provided with course credit in exchange for participation. They were asked to copy and paste their eight most recent Facebook status updates, to report the date on which the updates were posted, and to remove names of persons mentioned in their posts to ensure anonymity. Participants were asked questions

assessing narcissism as well as standard demographic questions relating to gender and race. There were a total of 380 participants who provided at least one status update. The sample was primarily White (82%) and female (74%).

Measures

Average time between status posts. To calculate the status posting frequency variable, the number of days between the most recent and least recent reported posts was calculated and then divided this by the number of reported posts (M = 34.5; SD = 42.1).

Content analysis of status posts. Coding status posts involved two discrete judgments on the part of content coders. First, coders must judge whether a post was *directed* toward another user/users or whether it simply *reported* the thoughts, feelings, or behavior of the user themselves ("directed" or "reported"). If a message is coded as "reported," coders must judge whether or not the post included any mention of a "familiar other." This coding scheme yielded a total of three possible categories: "directed message", "self-focused reported message", and "other-focused reported message"[1]. Table 1 shows the different types of posts with examples of each. To ensure reliable coding, three independent coders (the authors of the study) first categorized two randomly chosen 50-post sub-samples. The first sub-sample served as the basis for a discussion on how to reconcile inconsistent coding among the coders. Following this, the second sub-sample was then used to calculate inter-coder reliability. For the first judgment ("directed" or "reported"), Krippendorff's Alpha = .77, and for the second judgment (if "reported," "self-focused reported" or "other-focused reported"), Krippendorff's Alpha = .81, indicating acceptable inter-coder reliability. The posts in the sample were then divided among the three coders.

Outcome variables. Three variables were calculated in order to determine the proportion of users' codable status posts that were "directed," "self-focused reported," and "other-focused reported." The number of each participant's status posts that were coded as "directed" was summed, as was the number of each participant's status posts that were coded as "self-focused." This yielded two separate composite variables. The "other-focused

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[1] A category for self-focused, directed messages was not created, as it was deemed unlikely that users would use social media to publically direct a message toward themselves (e.g., "wishing myself good luck on the exam!").

reported" composite variable was created by counting the number of status posts for each subject that were coded as neither "directed" nor "self-focused." To account for the fact that not all subjects provided eight codable posts, these summative scores were then divided by the number of codable posts provided by the participant, yielding three variables that reflected the proportion of codable posts that fit into each of the three mutually exclusive categories.

Table 1

Types of Status Posts

Type	Example
Directed Message	"Why is school so important?"
Self-focused Reported Message	"I smell really bad"
Other-focused Reported Message	"Can't wait for (name of friend) to come hang out with me and (name of other friend)!"

Narcissism. To measure narcissism, the 16-item version of the Narcissism Personality Inventory, a previously validated paired-item measure developed by Ames, Rose, and Anderson (2006), was used. Each pair consisted of a narcissism-consistent statement (e.g., "I like to be the center of attention") and a narcissism-inconsistent statement (e.g., "I prefer to blend in with the crowd"). Participants were asked to select the statement in each pair that best described them (1 = narcissism-consistent statement; 0 = narcissism-inconsistent statement). Their scores on each item pair were added to create a measure of overall narcissism (KR-20=.69; M = 5.35; SD = 3.07).

ANALYSIS AND RESULTS

To test the hypotheses and research question, four regression analyses were conducted. In all four of these analyses, the independent variables were the measure of narcissism and two control variables commonly used in studies of social media use – gender and race (White / Non-White). In the latter three regression analyses, "average time between status posts" was included as an additional control variable. The first

regression, testing Hypothesis 1, used the "average time between status updates" variable as the dependent variable. The second regression, testing Hypothesis 2, used the proportion of status posts that were directed as the dependent variable. The third regression, testing Hypothesis 3, used the proportion of status posts that were self-focused reports as the dependent variable. The fourth regression, testing Research Question 1, used the proportion of status posts that were other-focused reports as the dependent variable.

Bivariate correlations of our variables of interest are reported in Table 2. Regression results are presented in Table 3. Bivariate correlations show narcissism to be negatively correlated with the average time between status posts, indicating that as narcissism increases users are likely to post more often. Narcissism is also negatively correlated with the proportion of users' posts that are other-focused reports, while it is positively correlated with the proportion of users' posts that are self-focused reports.

The first regression established evidence of a negative relationship between narcissism and the average time between users' status posts, confirming Hypothesis 1. The analysis also showed evidence of a relationship between race and status posting frequency such that White participants posted less frequently than Non-White participants. In total, the predictor variables predicted roughly three percent of the variance in posting frequency. The second regression showed no significant relationship between narcissism and the proportion of status posts that were self-focused reports, failing to support Hypothesis 2. However, it does show evidence of a relationship between gender and the proportion of status posts that were self-focused reports, indicating that males were significantly more likely to post self-focused reports than females. It was also observed that a relationship between race and the proportion of status posts that were self-focused posts exists, such that Non-White users were significantly more likely to post self-focused reports than White users. The predictor variables predicted roughly six percent of the variance in the proportion of users' posts that were self-focused. The third regression showed no significant relationship between narcissism and the proportion of status posts that were directed, failing to confirm Hypothesis 3. Gender was related to the proportion of status posts that were directed, indicating that females were more likely to post directed messages than males. Race was related to the proportion of status posts that

were directed, indicating that White users were more likely to post directed messages than Non-White users. The predictor variables predicted roughly four percent of the variance in the proportion of users' posts that were directed at other users. The fourth regression showed a significant negative relationship between narcissism and the proportion of status posts that were other-focused reports. The predictor variables predicted roughly three percent of the variance in the proportion of posts that were focused on other users.

Table 2

Bivariate Correlations of Variables

Variable	1	2	3	4	5	6	7	Mean (SD)
1. Race		.00	.05	**.11***	**.11***	-.08	.09	.82 (.38)
2. Gender			**-.23***	-.02	**.11***	**-.19***	.09	.74 (.44)
3. NPI-16				**-.13***	.03	**.10***	**-.17****	5.35 (3.07)
4. Avg. Time Between Posts (Days)					-.02	.02	-.04	34.5 (42.1)
5. Directed Posts						**-.77***	-.06	.24 (.23)
6. Self-Focused Posts							**-.52***	.61 (.27)
7. Other-Focused Posts								.18 (.18)

Pearson's *r* coefficients are presented. * < .05 ** < .01 *** < .001
Gender coded as 0 = male; 1 = female. Race coded as 0 = Non-White; 1 = White.

Table 3
Narcissism Predicting Status Post Frequency and the Proportion of Facebook Status Posts That Were Self-Focused Reports, Directed at Readers, and Other-Focused Reports, Controlling for Gender, Race, and the Average Time Between Posts.

Variable	Avg. Time Between Posts			Self-Focused Posts			Directed Posts			Other-Focused Posts		
	B	SE B	ß	B	SE B	ß	B	SE B	ß	B	SE B	ß
Gender	-.04	.13	-.02	**-.11**	**.03**	**-.20****	**.07**	**.03**	**.14***	.03	.02	.07
Race	**.31**	**.14**	**.12***	-.07	.03	-.12*	**.06**	**.03**	**.11***	.03	.02	.07
Avg. Time Between Posts				.01	.01	-.01	.01	.01	.01	-.01	.01	-.02
NPI-16	**.05**	**.02**	**.14***	.02	.01	.01	.01	.01	.09	**-.01**	**.01**	**-.12****
R Square		.03			.06			.04			.03	

* < .05 ** < .01
Gender coded as 0 = male; 1 = female. Race coded as 0 = Non-White; 1 = White.

DISCUSSION

Evidence from this study supports the belief that individuals with higher levels of narcissism tend to post more frequently on social media. However, evidence of a relationship between narcissism and the content of status posts were not as easy to interpret. When gender and race are taken into account, the associations between self-focused posts and narcissism are no longer significant. Regression analysis shows that gender is the best predictor of the tendency to post self-focused reports, with males more likely to post this way than females[2].

Similarly, the regression predicting the proportion of directed status posts showed that gender was the best predictor, with female users more likely to post in this manner

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[2] To explore the relationships among gender, narcissism, and self-focused posts, a moderation effect was tested in a separate regression. The interaction term was not significantly correlated with the outcome variable, failing to provide evidence that the effect of narcissism on the tendency to post self-focused posts was different for males and females.

than male users. Thus, it appears as though posting directed messages or messages about one's own thoughts, feelings, and behaviors to the exclusion of others reflect differences in the communication styles of males and females rather than differences in narcissism. Research on the relationship between the frequency of posting photographic self-portraits (i.e., "selfies") and narcissism (Sorokowski et al., 2015; Weiser, 2015) finds that women are more likely than men to post "selfies" while we found the proportion of posting self-focused status updates to be higher for men than women. Taken together, these findings suggest that neither gender may be more self-focused in their social media posts, but that males may use text-based self-focused expressions while females may be more inclined to post self-focused pictures. The findings also underscore the importance of delineating between self-*focused* status posts, which were not associated with narcissism, and self-*promotional* status posts, which have been linked to narcissism (Winter et al., 2014).

The results are also support the belief that differences in social media self-expression are linked to differences in race. The finding that Non-White users post more frequently than White users is consistent with the findings of Grasmuck et al. (2009). The finding that Non-White users were more likely than White users to post self-focused reports was consistent with DeAndrea et al.'s (2010) finding that African-American Facebook users posted more self-descriptions on their Facebook accounts' "About Me" sections than White users. The findings must be qualified by noting the small number of Non-White participants in our sample (n = 68) as well as an inability to differentiate among Non-White ethno-racial groups. Having noted this limitation, it can be argued that our results support the belief that social media self-expressions are shaped by cultural factors as well as psychological ones, and that future research would do well to include gender and race as variables of interest.

With regard to other-focused reports, the results suggest that those lower in narcissism tend to mention "familiar others" in their posts, even when controlling for the effect of gender and race. This suggests that such behaviors are more likely to be attempts to cultivate social connection rather than self-aggrandizement. This supports Donath's (2007) view that displays of public connection via social media function as a kind of "social grooming" integral to trust-building within communities.

Replicating Deters et al.'s Analysis

For purposes of comparison, the present study sought to replicate Deters et al.'s (2014) method of measuring posting frequency using a new data set and testing its relation to a previously validated measure of narcissism. An additional posting-frequency variable was created by counting the number of posts reported no more than six weeks prior to the data collection. Deters et al.'s six-week cut-off truncates the distribution in the status posting frequency in the present study's sample just as it did in Deters et al.'s sample, resulting in a modal value of 0. An analysis of the relationship between this variable and narcissism yields a null result, just as it did in Deters et al.'s study (r = .002, p = .96). The fact that the measure of posting frequency used in our primary analysis, which does *not* have a modal value equal to its lowest value, is correlated with narcissism while Deters et al.'s measure, which has a model value equal to its lowest value, is not correlated with narcissism suggests that the latter finding is likely a measurement artefact resulting from a "floor effect."

Precise measurements of posting frequency are difficult to obtain. Measures either create a burden on the user having to copy and paste their posts or necessitate researchers having greater access to participants' social media accounts, which may make participants feel as though they are sacrificing their privacy by participating in the study. Nevertheless, researchers have worked within these constraints to produce several different ways of measuring posting frequency. The majority of these measures are positively correlated with narcissism levels, which, in the estimation of the authors of the present study, constitutes sufficient evidence that such a link exists.

Limitations

The present study possesses several notable limitations. The coding scheme used to delineate the focus of posts could benefit from refinement. Some posts categorized as self-focused concerned something that happened to the user or something the user did while others conveyed the user's opinion of something. The former unambiguously focuses on the user while the latter could be considered to focus *on the person, place, event, or thing described*, or to focus *on the user's reaction*. Future studies could differentiate between these two types of reports.

It is also important to note the limitations of our sample, which was comprised primarily of White, female college students from the U.S. This limitation is shared with much of the published research on the connection between narcissism and social media use (e.g., Carpenter, 2012; Panek et al., 2013; Skues, Williams, & Wise, 2012). Future research should endeavor to use samples drawn from the general population as well as samples that are comprised of a more balanced proportion of males, females, and non-binary gender-identifying individuals. This is of particular importance given the evidence of gender-based differences in self-expression on social media. Additionally, it is acknowledged that Facebook is but one of many platforms for mediated self-expression. At the time data was collected, Facebook was the most popular of these platforms among the general population as well as the sampled age group (Smith & Anderson, 2018). Other platforms such as Instagram, Twitter, and Snapchat have become increasingly popular and therefore should be included in future analyses of narcissism and self-expression via social media.

It is also recognized that the percentages of variance in the outcome variables explained by our models are low (3-6 percent). While this suggests that many factors influencing the frequency with which users engage in particular kinds of self-expression are unaccounted for in the present study's models, this does not diminish the importance of such a study. Online self-expression, like offline self-expression, is likely the product of an enormously wide array of factors. Predicting its frequency and character is difficult, but researchers must start somewhere. Taken together with the findings of similar studies of narcissism and social media use, the findings presented in this study are intended to be a starting point for further research.

Conclusion

Social media constitute an information-rich communication environment which researchers might use to develop better understandings of how different people express themselves. Its use is not limited to the number of times users' click or the number of minutes they spend on a webpage. It behooves researchers to examine various characteristics of social media users' self-expressions and how they relate to characteristics of users. In addition to answering the questions of whether or not people use social media and how much they use it, researchers can now answer questions about *how* individuals use

it to express themselves, and do so using valid, reliable measures that reflect actual, everyday use.

Such research can speak to questions that are central to the debate about the impact of social media on individuals and societies. Among the more popular concerns about social media is the perception that they are key contributors to increases in narcissistic thinking and behavior and attendant social problems (e.g., aggression; depletion of shared resources) (Bushman & Baumeister, 1998; Campbell, Bush, Brunell, & Shelton, 2005). At the same time, researchers have demonstrated links between social media use and increased interpersonal connections and social trust (Valenzuela, Park, & Kee, 2009), often implicating the same features – status updates – that have been associated with increased levels of narcissism. Understanding the ideas being expressed via such features may be a key to understanding when and how such use is associated with maladaptive traits and negative outcomes and when it is associated with the fostering and maintenance of lasting social bonds.

References

Alloway, T., Runac, R., Quershi, M., & Kemp, G. (2014). Is Facebook linked to selfishness? Investigating the relationships among social media use, empathy, and narcissism. *Social Networking*, *3*(3). doi: 10.4236/sn.2014.33020

Ames, D. R., Rose, P., & Anderson, C. P. (2006). The NPI-16 as a short measure of narcissism. *Journal of Research in Personality*, *40*(4), 440-450. doi: 10.1016/j.jrp.2005.03.002

Buffardi, L. E., & Campbell, W. K. (2008). Narcissism and social networking web sites. *Personality and Social Psychology Bulletin*, *34*(10), 1303-1314. doi: 10.1177/0146167208320061

Bushman, B. J., & Baumeister, R. F. (1998). Threatened egotism, narcissism, self-esteem, and direct and displaced aggression: Does self-love or self-hate lead to violence?. *Journal of Personality and Social Psychology*, *75*(1), 219. doi: 10.1037/e552692012-026

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. doi: 10.1177/0146167205274855

Carey, A. L., Brucks, M. S., Küfner, A. C., Holtzman, N. S., Große, D. F., Back, M. D., ... & Mehl, M. R. (2015). Narcissism and the Use of Personal Pronouns Revisited. *Journal of Personality and Social Psychology*. doi: 10.1037/pspp0000029

Carpenter, C. J. (2012). Narcissism on Facebook: Self-promotional and anti-social behavior. *Personality and Individual Differences*, *52*(4), 482-486. doi: 10.1016/j.paid.2011.11.011

Chiou, W. B., & Lee, C. C. (2014). Enactment of one-to-many communication may induce self-focused attention that leads to diminished perspective taking: The case of Facebook. *Judgment and Decision Making*, *8*(3), 372-380.

DeAndrea, D. C., Shaw, A. S., & Levine, T. R. (2010). Online language: The role of culture in self-expression and self-construal on Facebook. *Journal of Language and Social Psychology*, *29*(4), 425-442.

große Deters, F., Mehl, M. R., & Eid, M. (2014). Narcissistic power poster? On the relationship between narcissism and status updating activity on Facebook. *Journal of Research in Personality*, *53*, 165-174. doi: 10.1016/j.jrp.2014.10.004

Donath, J. (2007). Signals in social supernets. *Journal of Computer-Mediated Communication, 13*(1), 231-251. doi: 10.1111/j.1083-6101.2007.00394.x

Donath, J., & Boyd, D. (2004). Public displays of connection. *Bt Technology Journal, 22*(4), 71-82. doi: 10.1023/B:BTTJ.0000047585.06264.cc

Fast, L. A., & Funder, D. C. (2008). Personality as manifest in word use: correlations with self-report, acquaintance report, and behavior. *Journal of Personality and Social Psychology*, *94*(2), 334. doi: 10.1037/0022-3514.94.2.334

Grasmuck, S., Martin, J., & Zhao, S. (2009). Ethno-racial identity displays on Facebook. *Journal of Computer-Mediated Communication, 15*(1), 158-188.

Holtzman, N. S., Vazire, S., & Mehl, M. R. (2010). Sounds like a narcissist: Behavioral manifestations of narcissism in everyday life. *Journal of Research in Personality*, *44*(4), 478-484. doi: 10.1016/j.jrp.2010.06.001

Humphreys, L., Gill, P., Krishnamurthy, B., & Newbury, E. (2013). Historicizing new media: A content analysis of Twitter. *Journal of Communication, 63*(3), 413-431. doi: 10.1111/jcom.12030

Junco, R. (2013). Comparing actual and self-reported measures of Facebook use. *Computers in Human Behavior, 29*(3), 626-631. doi: 10.1016/j.chb.2012.11.007

Marshall, T. C., Lefringhausen, K., & Ferenczi, N. (2015). The Big Five, self-esteem, and narcissism as predictors of the topics people write about in Facebook status updates. *Personality and Individual Differences*, *85*, 35-40.

McKinney, B. C., Kelly, L., & Duran, R. L. (2012). Narcissism or openness?: College students' use of Facebook and Twitter. *Communication Research Reports*, *29*(2), 108-118. doi: 10.1080/08824096.2012.666919

Ong, E. Y., Ang, R. P., Ho, J. C., Lim, J. C., Goh, D. H., Lee, C. S., & Chua, A. Y. (2011). Narcissism, extraversion and adolescents' self-presentation on Facebook. *Personality and Individual Differences*, *50*(2), 180-185. doi: 10.1016/j.paid.2010.09.022

Panek, E. T., Nardis, Y., & Konrath, S. (2013). Mirror or Megaphone?: How relationships between narcissism and social networking site use differ on Facebook and Twitter. *Computers in Human Behavior, 29*(5), 2004-2012. doi: 10.1016/j.chb.2013.04.012

Quan-Haase, A., & Young, A. L. (2010). Uses and gratifications of social media: A comparison of Facebook and instant messaging. *Bulletin of Science, Technology & Society*, *30*(5), 350-361. doi: 10.1177/0270467610380009

Raskin, R., & Shaw, R. (1988). Narcissism and the use of personal pronouns. *Journal of Personality*, *56*(2), 393-404. doi: 10.1111/j.1467-6494.1988.tb00892.x

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*(5), 1658-1664. doi: 10.1016/j.chb.2011.02.004

Skues, J. L., Williams, B., & Wise, L. (2012). The effects of personality traits, self-esteem, loneliness, and narcissism on Facebook use among university students. *Computers in Human Behavior*, *28*(6), 2414-2419. doi: 10.1016/j.chb.2012.07.012

Smith, A., & Anderson, M. (2018). *Social media use in 2018*. Washington, D.C.: Pew Research Center. Retrieved June 1, 2018 from http://www.pewinternet.org/2018/03/01/social-media-use-in-2018/

Sorokowski, P., Sorokowska, A., Oleszkiewicz, A., Frackowiak, T., Huk, A., & Pisanski, K. (2015). Selfie posting behaviors are associated with narcissism among men. *Personality and Individual Differences*, *85*, 123-127. doi: 10.1016/j.paid.2015.05.004

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*(4), 875-901. doi: 10.1111/j.1083-6101.2009.01474.x

Weiser, E. B. (2015). # Me: Narcissism and its facets as predictors of selfie-posting frequency. *Personality and Individual Differences*, *86*, 477-481. doi: 10.1016/j.paid.2015.07.007

Winter, S., Neubaum, G., Eimler, S. C., Gordon, V., Theil, J., Herrmann, J., ... & Krämer, N. C. (2014). Another brick in the Facebook wall: How personality traits relate to the content of status updates. *Computers in Human Behavior*, *34*, 194-202. doi: 10.1016/j.chb.2014.01.048

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IRB Statement of Compliance

The authors state that all data collection and analyses were conducted with the prior approval of the university's Institutional Review Board.

Online Connections

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