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“Let Me Take a Selfie”: Associations Between Self-Photography, Narcissism, and Self-Esteem

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The proliferation of social media in day-to-day life has raised numerous questions about how individuals present themselves in these arenas. The present study examined the associations of narcissism and self-esteem with the posting of self-photographs (“selfies”) on a popular photo sharing social networking site (i.e., Instagram). Participants were 128 undergraduate students (19 males, 109 females) ranging in age from 18 to 43 ($M = 20.46$, $SD = 3.59$). Selfies were coded according to their frequency relative to participants’ nonselfie posts and their apparent themes (i.e., physical appearance, activity/event/location, affiliation with others, collage, other/undifferentiated). The hypothesized relations of narcissism and self-esteem with the posting of selfies independent of theme were not significant. However, there was a significant relation between some dimensions of narcissism and specific categories of selfies (e.g., vulnerable narcissism with physical appearance selfies). The limitations of the present study, particularly in terms of sampling and other issues that may influence online presentations, as well as the implications for future research on social media photographic displays are discussed.

Keywords: narcissism, self-esteem, selfie, social media

Social media platforms have become exceedingly popular, exemplified by the frequency with which individuals use them and the various communicative purposes they have come to serve. Despite the rapid growth of research pertaining to behavior on social media, the empirical research has been slow to investigate the self-photography (i.e., “selfie”) aspect of social media that has been a common topic of discussion in the popular press and everyday life. One avenue of inquiry deals with what one’s social media behavior might convey about his or her personality tendencies.

Within the popular press, narcissism and self-esteem have frequently been proposed as important considerations in the rise of a selfie

culture (e.g., Martino, 2014; Walker, 2013), but empirical data on this issue are quite limited to date. Because social media inherently involves self-displays to a virtual audience and because narcissism includes preoccupation with favorable regard by others (Pincus & Roche, 2011; Raskin, Novacek, & Hogan, 1991), individuals with narcissistic tendencies may be more apt than others to post selfies on social media. Indeed, a recent study indicated that self-reported frequency of selfie posts on social networking sites was significantly correlated with self-reported narcissism among adult males (Fox & Rooney, 2015). Furthermore, because the format of many social media sites allows individuals to carefully choose, edit, and even delete what is posted or who is allowed to access their posts, individuals with low self-esteem may be more inclined to self-disclose (i.e., post a selfie) on social media as opposed to making overt displays of their appearance or personality during face-to-face interactions. On the other hand, the lack of confidence characterized by low self-esteem (Owens, 1993) and the fragile self-esteem thought to underlie some aspects of narcissism (Pincus & Roche, 2011) may deter in-

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dividuals with low self-esteem or high levels of narcissism from posting selfies. The present study aimed to empirically address some of these issues through naturalistic observation of individuals' posts of selfies on a photo-sharing social media platform in relation to their self-reported narcissism and self-esteem. This study represents the first known attempt to do so.

Selfies

According to popular news accounts, the selfie is believed to have debuted in its present form in 2004, with its usage reportedly skyrocketing by 17,000% since 2012 (Bennett, 2014; "A brief history of the selfie," 2013). Moreover, according to a nonscientific poll, 47% of adults reportedly admit to posting selfies, with 40% of adults aged 18 to 34 reporting posting at least one selfie a week (Bennett, 2014). The popularity of selfies on social media sites has captured public attention and has become an aspect of current pop culture. Indeed, countless nonempirical articles have been written in an attempt to describe and infer the factors involved in social media posts of selfies. Those who post a high number of selfies are believed to be narcissistic or attention-seeking (e.g., Martino, 2014), a notion supported by recent research utilizing self-reports of narcissism and social media behavior (Fox & Rooney, 2015). It has also been suggested that repeated attempts to achieve "the perfect selfie" can perpetuate insecurities and high self-consciousness; meanwhile, the absence of feedback, specifically positive feedback, on a selfie has been proposed as potentially dangerous for one's confidence and self-esteem (e.g., Martino, 2014; Walker, 2013).

However, not all of the attention on selfies has been negative. For instance, some have argued that selfies are a healthy form of self-exploration, allowing individuals to be more authentic, and that selfies can actually boost self-esteem (Rutledge, 2013). Others view selfies as a mean of communication that is replacing or enhancing the ever-popular text message (Wortham, 2013). Although opposing theories have been presented regarding the usage and meaning of selfies, these conclusions are mere conjecture, as the topic has yet to be analyzed empirically. This study began to address the gap between lay theories on the motives behind selfies and scientific evidence.

Narcissism and Social Media

Narcissism is characterized, in part, by a grandiose self-presentation that is motivated by the need to regulate self-esteem (Morf & Rhodewalt, 2001). As social media inherently involves self-presentation and feedback from others, it stands to reason that narcissism would be a factor in how some individuals approach social media. Research has suggested that narcissism is connected to a desire to have a large social network and a concern over getting the attention of others (Bergman, Fearington, Davenport, & Bergman, 2011). Social media platforms also offer the unique circumstance of an individual's audience (e.g., "followers") being largely under the presenter's control. Therefore, the image presented to others, and the feedback received from them, presumably take on particular importance, as the perceivers likely have some connection to the person posting on social media.

As might be expected, narcissism is related to managing a positive image of oneself on social media (Bergman et al., 2011) and to a higher level of social media activity overall (Buffardi & Campbell, 2008). Specific to sharing photos, as previously noted, narcissism is related to self-reported posting of selfies on social media, with the amount of time an individual spends editing photos of themselves on social networking sites (Fox & Rooney, 2015), and with the selection of profile pictures that highlight one's physical attractiveness or personality (Kapidzic, 2013).

Additional research has revealed that individuals scoring high on narcissism tend to post a higher quantity (Bergman et al., 2011) and more revealing (DeWall, Buffardi, Bonser, & Campbell, 2011) photos of themselves. Other evidence suggests that narcissism is associated with more exhibitionistic or attention-seeking posts on Facebook (Carpenter, 2012), including self-referential statements or updates and more frequent location check-ins (DeWall et al., 2011; Wang & Stefanone, 2013). Interestingly, Buffardi and Campbell (2008) reported that narcissism was not related to posting self-promoting or provocative pictures in general; however, narcissism was related to posting profile pictures that were deemed by independent coders to be self-promoting, sexy, and fun. Consistent with this line of research, it is conceiv-

able that a similar association would be evident for posts of self-photographs (i.e., “selfies”), as presumably such photos are inherently self-focused, with some perhaps being blatant attempts to gain attention from others due to one’s appearance, affiliations, or accomplishments.

A growing body of research has differentiated dimensions of narcissism based on their features and psychosocial correlates. Briefly, nonpathological narcissism is conceptualized as including many of the overt, observable characteristics of narcissism such as vanity, efforts to highlight one’s superiority over others, a sense of entitlement regarding positive appraisals from others, and a desire to be the center of attention (Miller & Campbell, 2012). This dimension of narcissism converges with high self-esteem (e.g., Barry & Kauten, 2014). A pathological form of narcissism, consisting of grandiose and vulnerable dimensions, has also been described in previous research (Pincus et al., 2009). Grandiose narcissism encompasses a willingness to exploit others to reach social goals, a contrasting desire to appear helpful to enhance one’s image, and fantasies of one’s superiority, whereas vulnerable narcissism involves self-esteem that is highly contingent on the appraisals of others, hypervigilance concerning rejection from others, and even a desire to detach from others presumably as a protection against possible ego threats (Besser & Priel, 2010; Lukowitsky & Pincus, 2013). Social media perhaps provide safe and appealing platforms for individuals with these features of narcissism (i.e., nonpathological, grandiose, vulnerable) to self-present in a confident, vane, or exhibitionistic manner and to receive positive feedback from others. Moreover, posting selfies may be a particularly simple way in which to do so. Thus, a presumption is that to the extent that posts of selfies are indicative of exhibitionism and a need for feedback from others, this act should be positively correlated with nonpathological and grandiose narcissism.

Self-Esteem and Social Media

Global self-esteem is conceptualized as one’s positive and negative evaluations of himself or herself and, relatedly, one’s approval or disapproval of the self (Coopersmith, 1967; Rosenberg, 1965). It differs from narcissism in that self-esteem is not closely tied to superiority

over others or preoccupation with others’ appraisals (Raskin et al., 1991). Thus, seeking, or responding to, feedback from others via social media would presumably be less clearly indicative of one’s self-esteem relative to narcissism. Nevertheless, some connection between self-esteem and social media behavior might be expected. It is conceivable that social media could enhance self-esteem, as individuals have the ability to self-select how they wish to present themselves and because they may receive social support or positive social feedback not acquired elsewhere. On the other hand, social media may foster low self-esteem through the inherent opportunity to compare oneself to others and the possibility that one may receive negative, or no, social feedback. Findings on social media and self-esteem have indeed been mixed. Prior studies have found negative (Fioravanti, Dèttore, & Casale, 2012; Donchi & Moore, 2004; Huang & Leung, 2012; Mehdizadeh, 2010; Vogel, Rose, Roberts, & Eckles, 2014), positive (Donchi & Moore, 2004; Gross, 2009; Valkenburg, Peter, & Schouten, 2006), and no associations (Baker & White, 2010; Wilson, Fornasier, & White, 2010) between self-esteem and social media use.

Specific to posting pictures on social media, Tazghini and Siedlecki (2013) report that individuals with lower self-esteem are more likely to remove unflattering pictures of themselves and are less likely to report sharing photos on Facebook as a positive feature than those with higher self-esteem. However, these findings may be more applicable to Facebook, which allows users to post, or tag, photos to another person’s timeline, thus hindering the self-selection process. In contrast, low self-esteem has also been associated with more displays of self-promotion in Facebook profile pictures (Mehdizadeh, 2010). Moreover, several studies that have focused on the self-presentation nature of social networking sites found that self-esteem appears to improve as one browses his or her own Facebook page, which is presumed to contain positive, self-selected information (Gonzales & Hancock, 2011; Toma, 2013). Current research illustrates that the link between self-esteem and social media behavior is unclear. However, posting selfies may be reflective of high self-esteem or may enhance self-esteem, as such photos typically emphasize one’s ideal, controlled image. Furthermore, the ability for

users to edit and self-select which selfies are posted, thus depicting an overly idealistic and favorable self-image of oneself (Gonzales & Hancock, 2011; Toma, 2013), may correspond with an elevated overall self-perception.

Current Study and Hypotheses

As noted above, the purpose of the present study was to offer an initial empirical examination of the association between posts of selfies (i.e., number, relative frequency) and self-perception, particularly narcissism and self-esteem. In other words, this study sought to address whether the frequent display of selfies on social media translates to the presence of narcissistic tendencies or higher self-esteem on the part of the individual making such posts. The present study also considered different categories of selfies as well as different dimensions of narcissism to further understand their possible connections. This study is the first known investigation of narcissism and self-esteem as related to actual posts of selfies. A recently published study (Fox & Rooney, 2015) relied on participants' self-reports of narcissism and social media posts, unlike the naturalistic observation of social media behavior (i.e., posting of selfies) used in the present study.

It was hypothesized that the number of selfies posted, the proportion of total posts that were selfies, and the frequency of selfie posts would be positively correlated with dimensions of narcissism (i.e., grandiose, vulnerable, and nonpathological). Posts of selfies were also hypothesized to be positively associated with self-esteem.

Associations between self-perception constructs and specific themes of self-photographs (e.g., physical appearance, affiliation with friends, event/activity/location) were explored, as were the relations between specific subscales of narcissism measures and selfie variables (i.e., proportions of selfie posts, frequency of selfies).

Method

Participants

Participants were 128 undergraduate students from a public university in the southeastern United States (19 males, 109 females) who ranged in age from 18 to 43 ($M = 20.46$, $SD =$

3.59). Regarding race/ethnicity, 77 participants identified as White/Caucasian, 45 identified as Black/African American, 3 identified as Asian, 2 as Hispanic, and 1 individual did not provide information on her racial/ethnic background. Participants were enrolled in an undergraduate psychology course at the time of their participation and received research credit or extra credit for participating in the study, which was described as a study on "Instagram and personality." To participate, individuals were required to have an active account on Instagram, a photo-sharing social media platform. Students from any academic major were allowed to participate.

Measures

Pathological Narcissism Inventory (PNI; Pincus et al., 2009). The PNI consists of 52 items with responses made on a 6-point scale ranging from 1 to 6. Research has supported the structure of the PNI as consisting of a Grandiose Narcissism dimension which consists of Grandiose Fantasy, Self-sacrificing Self-enhancement, and Exploitativeness subscales and a Vulnerable Narcissism dimension composed of Contingent Self-esteem, Devaluing Others/Need for Others, Hiding the Self, and Entitlement Rage subscales (Pincus et al., 2009; Roche, Pincus, Lukowitsky, Menard, & Conroy, 2013). The internal consistency of scores on the Grandiose Narcissism dimension was $\alpha = .90$, the internal consistency for Vulnerable Narcissism scores was $\alpha = .96$, and subscale score internal consistency ranged from $\alpha = .78$ to $.94$.

Narcissistic Personality Inventory (NPI; Raskin & Terry, 1988). The NPI is a 40-item forced choice inventory that assesses nonpathological narcissism (Miller & Campbell, 2012). Respondents choose one of two statements for each item (e.g., "I try not to be a show off vs. I am apt to show off if I get the chance"). In the present sample, the NPI had an overall internal consistency of $\alpha = .85$. The NPI also includes seven subscales (i.e., Authority, Entitlement, Exhibitionism, Exploitativeness, Self-sufficiency, Superiority, Vanity; Raskin & Terry, 1988). The Entitlement, Exploitativeness, and Self-sufficiency subscales were excluded from analyses at the subscale level due to poor internal consistencies (i.e., $\alpha < .40$) of these sub-

scale scores. The internal consistency of scores on the remaining NPI subscales ranged from $\alpha = .60$ to $.80$ in the present study.

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965). The RSES is a widely used 10-item scale assessing global self-esteem (e.g., “Overall, I am satisfied with myself”). Responses are made on a 4-point scale from *strongly disagree* to *strongly agree*. In the present sample, RSES scores had an internal consistency of $\alpha = .87$.

Selfie coding. Participants provided their Instagram account username and consented to have their account observed for 30 days. Within this time period, four independent coders, who were blind to participants’ ratings on self-report measures, recorded (a) the number of weeks since the participant’s first post (recorded at the end of the observation period), (b) the overall number of photographs since the first post, (c) the number of photographs posted within the 30-day period, (d) the number of followers each participant had at the beginning and end of the 30-day period, (e) the overall number of selfies, and (f) the number of selfies within the 30-day period. Situations/themes for each selfie were also documented. The situations/themes coded for this study were based on discussion among coders following initial observations of participants’ Instagram pages. These categories were physical appearance, affiliation with friends, event/activity/location, collage (i.e., a single post combining at least two or more selfies), and other/undifferentiated. Contextual information accompanying the post (e.g., captions, hashtags) was used to aid in categorical coding and in determining, in some cases, if a photo was a selfie versus taken by another individual. Without explicit contextual information, the category “other/undifferentiated” was coded. If more than one theme appeared to be represented (e.g., a photo with a group of friends at a well-known landmark, the more specific category—event/activity—was coded). To establish interrater reliability, the four raters all coded the initial 15 posts from eight participants (i.e., 120 photos). The intraclass correlation coefficient (ICC) for whether a photograph from this group was a “selfie” was $.98$. Coders then categorized each selfie. For each photograph from this group that was determined to be a selfie, the ICC for the specific category code was $.99$. Following that procedure, each coder rated a

unique 25% of the participants. From this information, the total number of selfies, the proportion of total posts that were selfies, the rate of selfies posted per week, and the total posts and proportions for each theme were recorded for each participant and were used as variables in the present study.

Procedure

This study was approved by the Institutional Review Board at the authors’ affiliated university. Following informed consent, participants completed self-report inventories (i.e., PNI, NPI, RSES) and a demographic form online via the secure survey website, Qualtrics. On the demographic form, participants also provided their Instagram account name so that they could be “followed” (observed) by an Instagram account established for the present study and accessed only by the authors of this study. Participants also provided an e-mail address so that they could be prompted after one week if they had not yet approved the follow request from the study’s Instagram account. This research account was private (i.e., participants and other Instagram users were unable to “follow” the account) in an effort to keep participants’ posts confidential from each other. At the end of 30 days, participants were no longer followed by the study’s Instagram account.

Results

Descriptive statistics for the main study variables are shown in Table 1. As can be seen in Table 1, there was considerable range in the total number of selfies posted by participants. Two participants were excluded from the analyses because their total number of self-photographs was more than 4 standard deviations above the sample mean. An additional two participants had a proportion of selfies equaling 1.00 (i.e., 100% of their posts were selfies). However, further inspection revealed that each of these latter participants had a total of only two posts on their Instagram accounts. Therefore, these participants were excluded from analyses, as most analyses involved proportions of posts that were selfies. Including these participants would mean ascribing undue weight to participants with a total of two posts each, particularly in light of the distribution of posts

Table 1
Descriptive Statistics for Main Variables of Interest

Variable	<i>M</i>	<i>SD</i>	Range	Skewness
No. of selfies	56.06 (67.70)	70.06 (127.52)	0–326 (0–1182)	2.10 (5.93)
No. of total posts	249.37 (271.34)	314.77 (395.71)	1–2550 (1–2931)	4.17 (4.38)
Selfies/total posts	.24 (.26)	.17 (.19)	0–.81 (0–1.0)	.95 (1.37)
Selfies/week	.68 (.90)	.78 (1.86)	0–4.22 (0–17.75)	1.93 (6.65)
Vulnerable Narcissism	3.13 (3.11)	.99 (1.00)	1.00–5.30 (1.00–5.30)	–.10 (–.10)
Grandiose Narcissism	3.83 (3.83)	.83 (.85)	1.00–5.52 (1.00–5.52)	–.77 (–.90)
Nonpathological Narcissism	16.65 (16.83)	6.92 (6.94)	3–34 (3–34)	.04 (.02)
Self-esteem	21.66 (21.67)	5.39 (5.34)	3–30 (3–30)	–.66 (–.66)

Note. Data excluding outliers on total number of selfies (i.e., > 3 *SD* above sample mean, $n = 2$; or with a proportion of selfies = 1.0, $n = 2$; or 1 individual > 8 *SD* above sample mean on selfies per week) are shown followed by data with outliers included in parentheses. Scores for Vulnerable Narcissism and Grandiose Narcissism are based on mean item scores. Self-esteem data were only available for 105 participants.

noted in Table 1. Finally, one participant had a frequency (i.e., 17.75 selfies/week) that was >8 *SD* above the sample mean, with the next highest frequency of remaining participants being 4.22 selfies per week. This participant was also excluded from main analyses due to the substantial influence that she had on the distribution of the frequency data (see Table 1), resulting in a total of 5 outliers excluded. Therefore, the main analyses were conducted with the remaining 123 participants (18 males, 105 females).

Bivariate correlations among variables excluding the outliers described above are shown in Table 2. As shown in Table 2, and contrary to hypotheses, the proportion of total posts that were classified as selfies and the frequency of selfies were unrelated to the dimensions of narcissism or self-esteem. In addition to the results shown in Table 2, the number of Instagram followers that participants had at the beginning, $r = .26, p = .003$, and the end of the study, $r = .37, p < .001$, were significantly correlated with the proportion of posts that were selfies. The

frequency of selfies was also correlated with the number of followers at the beginning and end of the study, $r = .22, p = .02$, and, $r = .23, p = .01$, respectively.

Descriptive statistics for the selfie categories are shown in Table 3. Additional analyses were conducted concerning the proportion of total posts represented by each selfie category described above (i.e., physical appearance, affiliation, event/activity/location, collage). The proportion of posts represented by affiliation selfies was not correlated with the other categories. The proportion of physical appearance selfies to total posts was significantly correlated with the proportion for event/activity/location selfies, $r = .27, p = .002$, and with collages, $r = .18, p = .047$. Table 4 displays the correlations of specific categories of selfies with the narcissism composites and self-esteem. As shown in Table 4, vulnerable narcissism was positively associated with a higher proportion of posts that were physical appearance selfies, grandiose narcissism was negatively associated with affiliation

Table 2
Correlations Among Overall Selfie Proportions, Narcissism Dimensions, and Self-Esteem

Variable	1	2	3	4	5	6
1. Selfies/total posts	—	—	—	—	—	—
2. Selfies/week	.47***	—	—	—	—	—
3. Grandiose Narcissism	–.07	.02	—	—	—	—
4. Vulnerable Narcissism	–.06	.12	.75***	—	—	—
5. Nonpathological Narcissism	.10	.01	.37***	.17	—	—
6. Self-esteem	.10	–.03	–.08	–.34***	.29**	—

Note. Results are based on exclusion of outliers as described above.
 ** $p < .01$. *** $p < .001$.

Table 3
Descriptive Statistics for Selfie Categories

Variable	<i>M</i>	<i>SD</i>	Range	Skewness
Physical appearance/total posts	.03 (.03)	.04 (.03)	.00-.17 (.00-.17)	2.18 (2.13)
Physical appearance/total selfies	.12 (.12)	.17 (.17)	.00-1.00 (.00-1.00)	3.04 (3.09)
Affiliation/total posts	.06 (.07)	.06 (.11)	.00-.50 (.00-1.00)	3.51 (5.87)
Affiliation/total selfies	.30 (.30)	.24 (.24)	0-1.00 (0-1.00)	.83 (.88)
Event or activity/total posts	.05 (.05)	.04 (.06)	.00-.19 (.00-.50)	1.02 (3.87)
Event or activity/total selfies	.21 (.21)	.18 (.18)	.00-1.00 (.00-1.00)	1.30 (1.27)
Collages/total posts	.04 (.04)	.06 (.06)	.00-.33 (.00-.33)	2.60 (2.53)
Collages/total selfies	.11 (.11)	.16 (.15)	.00-1.00 (.00-1.00)	2.53 (2.51)
Other/total posts	.07 (.07)	.09 (.09)	.00-.46 (.00-.46)	2.08 (1.96)
Other/total selfies	.24 (.24)	.20 (.21)	.00-1.00 (.00-1.00)	1.01 (.96)

Note. Data excluding outliers on total number of selfies are shown followed by data with outliers included in parentheses. *x*/total posts = proportion of number of selfies in the described category to total Instagram posts; *x*/total selfies = the proportion of total selfies that were in the described category.

selfies, and nonpathological narcissism was positively correlated with the proportion of selfie collages. Selfie collages were also correlated with the number of Instagram followers participants had at the beginning and end of the study, for both time points: $r = .29, p = .001$.

Lastly, correlations between NPI and PNI subscales were examined (see Tables 5 and 6). In short, posting selfies overall was negatively correlated with Contingent Self-esteem from the PNI. Physical appearance selfies were positively associated with the Hiding the Self and Devaluing Others/Need for Others aspects of vulnerable narcissism and the Self-sacrificing Self-enhancement dimension of grandiose narcissism. On the other hand, affiliation selfies were negatively correlated with Self-sacrificing Self-enhancement and Exploitativeness. Selfie collages were negatively associated with Contingent Self-esteem but were positively correlated with the NPI Vanity and Superiority subscales.

Discussion

The present study represented the first known empirical investigation of the association between individual difference variables and the actual display of selfies on a social media site. Two main findings emerged. First, the results indicate that, despite individual variability, posting selfies was a fairly common occurrence, with some participants having posted hundreds of such pictures. Second, there was a general lack of association between self-reported narcissism and self-esteem with overall postings of selfies suggesting that other constructs are predictive of this specific, and relatively new, self-presentation behavior. At least in terms of our sample of young adults, this behavior may simply be a typical way of communicating with others via social media. In fact, 98.4% of participants posted selfies. A higher proportion and a higher frequency of selfie posts were associated with the size of one's Instagram audience

Table 4
Correlations of Narcissism Dimensions, and Self-Esteem With Selfie Categories

Dimension	Physical appearance	Affiliation	Event/Activity	Collage
Grandiose Narcissism	.14	-.22*	-.09	-.08
Vulnerable Narcissism	.18*	-.13	.02	-.13
Nonpathological Narcissism	.03	-.11	-.08	.19*
Self-esteem	.00	.01	-.12	.15

Note. Categories represent the proportion of selfies coded for a category out of an individual's total number of Instagram posts.

* $p < .05$.

Table 5
Correlations Between Dimensions of Pathological Narcissism and Selfie Categories

Dimension	Total selfies	Physical appearance	Affiliation	Event/Activity	Collage
Vulnerable Narcissism					
Contingent self-esteem	-.22*	.08	-.04	-.01	-.29**
Entitlement rage	-.07	.12	-.16	.06	.03
Hiding the self	.11	.24**	-.08	.01	-.02
Devaluing others/need for others	.00	.18*	-.15	-.01	-.09
Grandiose Narcissism					
Exploitativeness	-.10	.00	-.26**	-.15	.04
Self-sacrificing					
Self-enhancement	-.06	.21*	-.24**	-.01	-.09
Grandiose fantasy	-.01	.14	-.06	-.05	-.15

Note. Results are with outliers ($n = 5$) excluded. Categories represent the proportion of selfies coded for a category out of an individual's total number of Instagram posts.

* $p < .05$. ** $p < .01$.

(i.e., number of followers), which could be indicative of perceiving a higher demand for one's posts or of higher activity on this particular photo sharing site in general. One particular correlation also suggests that fragile, or contingent, self-esteem is related to a lack of selfie posts, perhaps for fear of negative feedback or a lack of positive feedback. Still, as demonstrated in Table 1, there was substantial variability in the extent to which individuals engaged in posting selfies, indicating that there are likely relevant intraindividual factors not captured by narcissism or self-esteem.

Demographic factors, such as age, are also likely factors in social media behavior because of generational differences in experience with, and exposure to, social media. Given the focus on college undergraduates in this study, generational differences in posts of selfies could not be adequately explored. Moreover, the roles of gender, race/ethnicity, and culture in social media behavior, including the display of selfies, should be considered in more diverse samples.

Some patterns concerning self-perception constructs and specific selfie categories emerged. The theme of a selfie may be a more clear window into an individual's communicative intent and self-perception display than would be evident from the posting of selfies in general which appears to be a fairly normative behavior, at least among this sample of participants. Vulnerable narcissism was correlated with posting selfies with a physical appearance theme. That is, a relatively high proportion of selfies that were oriented toward highlighting physical appearance was more common in individuals who self-reported characteristics such as entitlement, fragile self-esteem, and perhaps, counterintuitively, a tendency to not reveal one's perceived weaknesses or faults to others. Physical appearance selfies were specifically correlated with the Hiding the Self and Devaluing Others/Need for Others elements of vulnerable narcissism. These findings suggest that individuals with vulnerable narcissism may use the display of physical appearance selfies to

Table 6
Correlations Between Dimensions of Nonpathological Narcissism and Selfie Categories

Dimension	Total	Physical appearance	Affiliation	Event/Activity	Collage
Authority	.01	-.05	-.08	-.18*	.11
Vanity	.17	-.06	-.08	.00	.30**
Superiority	.16	.16	-.16	.03	.29**
Exhibitionism	.01	.00	.02	.05	-.05

Note. Results are with outliers ($n = 5$) excluded. Categories represent the proportion of selfies coded for a category out of an individual's total number of Instagram posts.

* $p < .05$. ** $p < .01$.

assert a sense of confidence in a relatively safe forum of social media. Social media at least have a physical barrier and an audience generally known and accepted by the person making the displays. Moreover, although not addressed in this study, photo sharing on social media may have additional appeal because of the availability of filters, cropping, and other manipulations so that one can truly craft a preferred image to others. These more nuanced aspects of social media behavior should be a focus of further research.

The posting of selfie collages, operationalized as an array of photos in which at least two photos in the array were selfies, was correlated with nonpathological narcissism. Further examination of subscales of narcissism indicated that collages were positively correlated with the NPI Vanity and Superiority subscales and negatively correlated with the Contingent Self-esteem subscale of the PNI. These findings suggest that individuals who post a relatively high frequency of selfie collages have a willingness to share multiple images of themselves and a positive self-image that is apparently not highly contingent on feedback from others. However, it should be noted that the proportion of selfie collages was positively correlated with the number of participants' Instagram followers. Thus, if a higher number of followers is indicative of higher Instagram use, another factor in posting collages may be the frequency and adeptness with which individuals use this form of social media. As noted above, there could also be an assumption on the part of the user that a higher number of followers translates to a higher demand for his or her posts.

The category of event/activity/location yielded only one small correlation with the measures of self-perception used in this study (i.e., a negative correlation with the Authority subscale of the NPI). Individuals who are confident in their authority (i.e., believing that they are good leaders or are good at getting what they want) may then be less apt to post selfies that demonstrate their activities or accomplishments. However, another issue with this category may be the wide variety of events that might have qualified for this category (e.g., vacations, graduation, awards, sporting events, meals with friends, etc.), making it difficult to discern potential self-perception correlates with such posts.

Lastly, the affiliation category (i.e., selfies taken with another person(s) with no apparent event to document or desire to show off one's appearance) demonstrated a somewhat different pattern in its relation with narcissism. Affiliation selfies were negatively correlated with grandiose narcissism, particularly the Self-Sacrificing Self-enhancement and Exploitativeness subscales of the PNI. Affiliation selfies (or "usies" as has been termed in some popular press) may, therefore, be suggestive of better interpersonal relationships that are then displayed via social media. Although entirely speculative, one possibility is that some participants with a self-reported tendency toward grandiosity may have limited their display of affiliations so as to not appear equal, or even inferior to, peers. A lack of such posts may also suggest strained relationships with peers, perhaps connected to higher grandiose narcissism. These possibilities are in need of more direct empirical investigation as to the motives surrounding different types of selfies.

The lack of significant associations between self-esteem and posts of selfies was contrary to our hypothesis but seems consistent with some prior research on other social media sites. For example, Forest and Wood (2012) found that individuals with low self-esteem did not differ from those with high self-esteem in their amount of Facebook use. It may be that individuals with low self-esteem view Facebook and other forms of social media as a less threatening avenue in which to express themselves and are, therefore, comfortable and willing to self-disclose. As such, it appears individuals with low self-esteem may be as willing as those with higher self-esteem to post selfies on social media sites because it provides an alternative to in-person self-disclosure in a safe, controlled setting.

The present study had a number of limitations that may have influenced the findings and/or that should be addressed in future research. First, the predominantly female sample of undergraduates limits the generalizability of findings to adults in general or other age groups. This gender imbalance also precluded our ability to meaningfully evaluate the role of gender in the relations of interest. Still, our sample characteristics might be expected in light of reports that 68% of Instagram users identify as female (Smith, 2014). Furthermore, females

have been reported to be more active Facebook users than males with more Facebook friends, posted photos, profile pictures, and shared photos (Haferkamp, Eimler, Papadakis, & Kruck, 2012; McAndrew & Jeong, 2012; Mesch & Beker, 2010). Therefore, it is plausible that females tend to engage more in social media usage than males in general and may have been particularly likely to pursue participation in a study of this nature. Likewise, although our sample only included college students with a mean age of 20.46 ($SD = 3.59$), the age range varied from 18 to 43, which is relatively consistent with the active population of Instagram users. According to Smith (2014), 90% of Instagram users are under the age of 35, and those with at least some college education or a college degree make up 41% of Instagram users.

Undoubtedly, the present sample demonstrated a self-selection bias in terms of one's willingness to participate in a study on "Instagram and personality." Despite what factors might have drawn participants to this particular study, it should be noted that the measures of self-perception demonstrated little skew, suggesting that any sort of self-selection was not tied to particularly high or low levels of self-esteem or narcissism. Furthermore, the study observed participant behavior on only one particular social media site (i.e., Instagram), which was chosen for its relative simplicity and its exclusive focus on posting of images.

In addition, despite the apparent meaningfulness of the selfie categories examined in this study, they may not be exhaustive or replicable across other samples. Indeed, our conservative approach to categorizing photos resulted in a fairly large number being placed in the Other/undifferentiated category (see Table 3). Future research may be devoted toward refining categories in a manner that does not compromise reliability of coding and validity of associated interpretations or that does not lose information such as the particular message that the subject of the selfie is attempting to convey. Lastly, the present methodology involved coding selfies that both predated and postdated participants' completion of self-perception measures. In most cases, the majority of selfies were posted before completion of measures for this study. Participants may have altered their style of Instagram use within the 30-day period, including deleting previous posts knowing that their account was

being followed. Naturalistic observation of social media behavior such as in the present study makes such issues quite difficult to control. Still, future research should attempt to account for the temporal relations among self-perception and social media behaviors through longitudinal designs allowing for assessment at multiple time points. Moreover, it may be useful for future research to incorporate qualitative data, such as captions assigned to each selfie or comments from others, which could be more clearly indicative of self-perception and other personality constructs, as well as to how such displays are perceived by others.

Research in this area should also be expanded to include the variety of venues in which posts of selfies and similar behaviors occur (e.g., Facebook, Snapchat, etc.), particularly in light of the rapid innovations involved in existing and new social media platforms. For this initial empirical investigation, Instagram was selected for its relative popularity and the relative ease with which photos can be observed and coded. That is, Instagram is exclusively a photo-sharing site, whereas Facebook, for example, allows users and "friends" to post a variety of content (including photos), making the selection and observation of one's own selfie posts more difficult. Nevertheless, research in this area should expand its scope to other forms of widely used social media.

Furthermore, how active an individual is on a particular social media site or a variety of such sites, as well as his or her subjective sense of needing contact via social media, could be relevant in understanding the display of selfies and related social media behavior. Other variables not assessed in this study (e.g., the rated or self-perceived attractiveness of the person posting photos, the perceived familiarity of one's followers/friends, the social media activities/behaviors of one's peer affiliations) are important areas for future inquiry as well. As noted above, because social networking has become commonplace in the lives of many adults and adolescents, further research is needed to differentiate indicators of normative versus problematic behaviors in this domain.

Nadkarni and Hoffman (2012) note that the primary motives for social media use revolve either around a need to belong or a need for self-presentation. Overall, although the correlations between dimensions of narcissism and cat-

egories of selfies in the present study were generally small in magnitude, they appear consistent with motives for self-presentation for individuals with narcissistic tendencies. A strong desire for self-presentation versus belongingness directly aligns with the association between narcissism and an emphasis on agentic qualities for reaching social goals at the expense of communality (e.g., Findley & Ojanen, 2013).

Aside from mere posting of selfies and how that behavior relates to self-perception constructs like narcissism, more research is needed on the dynamic interplay among a variety of factors that might accompany social media behavior. For example, the observer of such social networking displays may make a variety of inferences about individuals engaged in a great deal of self-photography, and they may judge potential photographic displays of narcissism differently than verbal displays (e.g., status updates). Already, research has demonstrated that narcissistic status updates on Facebook are perceived more negatively than relatively neutral updates (Kauten, Lui, Stary, & Barry, 2015). Therefore, the potential negative interpersonal consequences from some social networking behaviors should be a focus of future research. Furthermore, an individual, particularly one with narcissistic tendencies, may seek or expect particular feedback from others regarding his or her posts. An important question involves how personality and self-perception influence an individual's response to social media feedback from others. The specific factors that promote or maintain individuals' posts were not examined in this study and are also in need of further research. More than addressing a societal curiosity, empirical research of this nature has potential importance insofar as social media behavior represents an increasingly prevalent and relevant aspect of many individuals' interactions with others and, in turn, has notable interpersonal implications.

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