



# Selfies and personality: Who posts self-portrait photographs?



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## ABSTRACT

Online social networking (OSN) sites play many roles ranging from communication to entertainment. The current paper presents an analysis of the recently emerged OSN phenomenon of the selfie (self-portrait photographs of oneself). In two studies involving a total of 1296 men and women, we tested the prediction that selfie-sharing on various OSN sites (including Facebook) is positively related to social exhibitionism, extraversion, and self-esteem. Participants reported sharing anywhere between 0 to 650 selfies per month on various OSN sites, and were found to post, on average, 2.9 selfies of themselves, 1.4 selfies with a romantic partner, and 2.2 group selfies to Facebook each month. Women posted more selfies of each type than did men. Regardless of sex, our results indicate that social exhibitionism and extraversion generally predicted the frequency of online selfie-posting in men and women, however we found no strong evidence for a relationship between self-esteem and selfie-posting behavior among women, and only weak evidence among men. The results of this work highlight key individual differences among OSN users that can account for some of the variation in online photo sharing behavior, and provide novel insight into the psychological factors driving this rapidly popularizing phenomenon.

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## 1. Introduction

The recent trend of promoting oneself through the use of online social networking (OSN) sites may have contributed to the emergence of a new and apparently self-presenting and self-promoting phenomenon: posting “selfies” to various OSN sites, such as Facebook. A selfie has recently been defined as, “a self-portrait photograph of oneself (or of oneself and other people), taken with a camera or a camera phone held at arm’s length or pointed at a mirror, which is usually shared through social media” (Sorokowski et al., 2015). Although the word describing this phenomenon is relatively new, in 2013 it had already become Oxford Dictionary’s word of the year. Despite its growing popularity, observed both in the increased usage of the word selfie (over 17,000% increase in usage from 2012 to 2013; Oxford Dictionary) and in the increased reference to selfies in various types of mass media (including songs and television series), the present study is one of only a small number of studies to investigate the phenomenon of the selfie.

Studies to date (Fox & Rooney, 2015; Sorokowski et al., 2015; Weiser, 2015) have shown that selfie-posting behaviors are positively related to narcissism, especially in the case of men. However, data

regarding other personality traits are scarce. The present research sought to better understand this new social phenomenon by exploring other characteristics of people differing in their selfie-posting activity. In their recent review of studies investigating the social functions of Facebook – currently the most popular social networking site – Nadkarni and Hofmann (2012) suggested that social media usage satisfies two basic social needs: the need to belong and the need for self-presentation. The present paper tested the hypothesis that selfie-sharing is related to self-presenting behaviors.

Past studies have analyzed a wide range of behaviors related to online self-presentation, including choice of Facebook profile picture (Back et al., 2010) and other online photo-sharing behaviors (Gosling, Augustine, Vazire, Holtzman, & Gaddis, 2011; Ong et al., 2011; Stefanone, Lackaff, & Rosen, 2011). Although many psychological characteristics appear to predict online photo-sharing activity, these studies suggest that extraversion, self-esteem, and exhibitionism are most consistently related to photo-sharing activity. Of the Big Five personality traits (McCrae & Costa, 2003), Gosling and collaborators (Gosling et al., 2011) found that an individual’s level of extraversion best predicted both the frequency of adding photos of themselves and other people to their Facebook profile, and the frequency of replacing their profile picture. In addition, more extraverted OSN users appear to be more engaged in social media use than are less extraverted users (Correa, Hinsley, & de Zúñiga, 2010). This is perhaps unsurprising, as extraverted people are generally highly sociable (McCrae & Costa, 2003).

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Nadkarni and Hofmann (2012) suggested that, in addition to a high level of extraversion, self-esteem may also predict the apparent need for self-presentation on OSN sites (Nadkarni & Hofmann, 2012). However, current evidence to support this prediction is mixed. Mehdizadeh (2010) found that individuals low in self-esteem engaged in more self-promoting behaviors on Facebook than did individuals with higher self-esteem, and women characterized by low self-esteem posted more self-promoting photos online than did women with higher self-esteem. Subramanian and colleagues (2014) further found that high self-esteem predicted more other- than self-referent Facebook posts. However, Krämer and Winter (2008) did not find any differences between the self-presentation behaviors of low and high self-esteem users. Social exhibitionism may also be associated with photo posting for self-presentation on OSN sites. Exhibitionism, as defined by Murray (1938), is related to vanity and a willingness to attract attention. Carpenter (2012) found that “Grandiose Exhibitionism” (a factor of narcissism) was related to self-absorption, whereas a need to be the center of others’ attention (Ackerman et al., 2011) appears to be an important determinant of self-promotion on Facebook (via status updates, photos, and attaining large numbers of friends).

The present study was designed to further explore the phenomenon of selfies and to assess the psychological characteristics of people differing in selfie-posting activity. Specifically, we measured the number of selfies shared via various online social media sites to test whether extraversion, self-esteem, and social exhibitionism predicted individual differences in selfie-posting behavior. To do this, we conducted two separate studies. The first study involved self-report questionnaires, and the second study was an online Facebook study. The traditional paper-and-pencil questionnaires used in Study 1 enabled us to reach a large, diverse group of participants, whereas the Facebook analysis used in Study 2 increased the reliability and validity of our findings, as actual and self-reported measures of OSN use might differ (Junco, 2013). We chose Facebook to conduct Study 2 for several reasons. First, Facebook is considered the prototypical OSN site (Wilson, Gosling, & Graham, 2012). It is also the largest OSN site; more than one billion people from all over the world (and 12.2 million people in Poland) have a Facebook profile. Additionally, one of the most prominent and popular features of Facebook is the ability for its users to post photos and share them with friends, acquaintances, or even strangers. According to Facebook statistics, more than 200,000 photos are uploaded to this website every minute, making it the world’s most popular online photographic service. Based on previous research discussed above and the nature of the personality characteristics included in our study, we predicted that in both Studies 1 and 2, extraversion, self-esteem, and social exhibitionism would be positively associated with selfie-posting.

## 2. Method

### 2.1. Participants

Study 1 included a total of 748 participants (355 women and 393 men) aged 17 to 47 years ( $M = 21.64$ ;  $SD = 3.41$ ). Participants were recruited from various university campuses in Poland. Study 2 included a total of 548 Facebook users (330 women and 218 men) aged 14 to 47 years ( $M = 23.72$ ;  $SD = 4.39$ ), none of whom took part in Study 1. These participants were recruited through personal contacts by the authors and their students. All participants provided informed consent prior to their inclusion in the study.

### 2.2. Measures

In both studies, each participant completed the following three personality questionnaires:

1. The Self-esteem (SES) Rosenberg scale (Rosenberg, 1989), Polish adaptation (Laguna, Lachowicz-Tabaczek, & Dzwonkowska, 2007). The SES scale consists of 10 declarative statements scored 1 (I definitely agree) to 4 (I definitely disagree) and it measures general, explicit and global levels of self-esteem, i.e. a person’s opinion about his or her value, understood as a relatively stable characteristic (Baumeister, Campbell, Krueger, & Vohs, 2003). The internal consistency (Cronbach’s alpha) of the Polish adaptation of this scale was .80 and .83 in Studies 1 and 2, respectively.
2. The Extraversion scale of the NEO-Five Factor Inventory (Costa & McCrae, 1992), Polish adaptation (Zawadzki, Strelau, Szczepaniak, & Sliwinski, 1998). The internal consistency (Cronbach’s alpha) of the Polish NEO-FFI extraversion scale was .76 and .77 in Studies 1 and 2, respectively.
3. The Murray Social Exhibitionism Index designed to measure a person’s willingness to be noticed, seen, and heard by other people (Siek, 1993) (adapted from (Murray, 1938)). The scale consists of 10 items scored 1 (I definitely agree) to 4 (I definitely disagree) with a possible score range of 10–40. The scale contains statements such as, “I prefer being noticed than staying in the shade”, “I enjoy it when other people observe me when I do something well”, and, “I like being the centre of attention during social meetings”. The test–retest reliability of the Polish version of this method is  $r_{tt} = .58$ . The internal consistency (Cronbach’s alpha) was .85 and .84 in Studies 1 and 2, respectively.

We examined three categories of selfies: own selfies; selfies with a romantic partner; and group selfies (i.e. taken with one or more individuals, excluding the romantic partner). In Study 1, the participants reported the self-assessed number of photos posted during the previous month on all types of OSN sites (including Facebook, Twitter, Instagram, and Whatsapp). In Study 2, we measured the actual, total number of photos posted by each participant on Facebook. We controlled for the age and sex of the participant in all analyses.

### 2.3. Procedure

In Study 1, each participant completed three questionnaires designed to assess their personality (listed above) and a survey designed to assess their selfie-sharing activity during the previous month. Participants were asked to count the number of each type of selfie (own, partner and group) and the total number of photos, excluding selfies, posted by them on social media. Questionnaires were completed by the participants at home and handed back in an envelope on a scheduled day.

In Study 2, undergraduate research assistants volunteered to take part in the project as recruiters. These students recruited participants from among their Facebook friends to take part in a study regarding personality and Facebook usage. The students messaged their Facebook friends individually with the use of Facebook chat; the recruitment message contained a general request to take part in the study, a short explanation of the study purpose, and an individually assigned link enabling the participants to complete the questionnaire. These invited individuals were informed that their responses would be entirely anonymous. When a participant agreed to participate in the study and completed the questionnaire, his/her responses appeared in a database under an individually assigned code. The code was anonymous, as it was not directly linked to the individual participant’s name or identity. Research assistants then counted all photos available to Facebook friends posted to each participant’s Facebook page, categorizing them as own selfies, selfies with a romantic partner, and group selfies. In order to avoid privacy setting violations, the photos were counted by one student experimenter only (every student experimenter counted only the pictures of their Facebook friends). Approximately 30% of all approached participants took part in the Facebook study.

### 3. Results

#### 3.1. Study 1

Participants in Study 1 declared posting/sharing anywhere from 0 to 650 selfies within the past month, including from 0 to 350 own selfies (mean,  $M = 3.88$ , standard deviation,  $SD = 23$ ), 0 to 100 selfies with a partner ( $M = 1.48$ ,  $SD = 6.12$ ), and 0 to 200 group selfies ( $M = 4.29$ ,  $SD = 17.34$ ). To test whether men and women differed significantly in the amount of selfies shared via OSN sites, we performed two-tailed independent sample  $t$ -tests ( $\alpha = .05$ ). Results revealed that women published significantly more own selfies and group selfies than did men ( $t > 2.8$ ,  $p < .05$ , see Table 1). Therefore, we conducted all subsequent analyses separately for each sex.

Reported numbers of selfies posted online and the scores in personality measures were not normally distributed (Kolmogorov–Smirnov  $p < .05$ ), therefore relationships between personality traits and selfie posting were assessed using non-parametric Spearman's  $\rho$  correlations ( $r_s$ ). The results of Study 1 revealed that among women, the number of posted selfies for each category correlated significantly and positively with extraversion ( $r_s = .15$  to  $.24$ , all  $p < .05$ ) and social exhibitionism ( $r_s = .16$  to  $.26$ , all  $p < .05$ ). There was no significant relationship between number of selfies reportedly posted by women and their self-esteem. Among the personality traits examined, women's extraversion significantly ( $p < .05$ ) correlated with their self-esteem and social exhibitionism ( $r_s = .38$  and  $.41$ , respectively), and women's self-esteem correlated with their social exhibitionism ( $r_s = .17$ ).

Among men, the number of posted selfies for each category correlated significantly and positively with extraversion ( $r_s = .17$  to  $.26$ , all  $p < .05$ ) and social exhibitionism ( $r_s = .13$  to  $.26$ , all  $p < .05$ ). Analogous to the results reported for women, there was no significant relationship between the number of selfies reportedly posted by men and their self-esteem. Also analogous to women, men's extraversion significantly ( $p < .05$ ) correlated with their self-esteem and their social exhibitionism ( $r_s = .26$  and  $.45$ , respectively), and men's self-esteem correlated with their social exhibitionism ( $r_s = .20$ ).

All relationships between participants' self-reported personality traits and the number of all types of selfies posted on OSN sites are given in Table 2.

#### 3.2. Study 2

In Study 2, we found that participants published from 0 to 86 own selfies ( $M = 2.87$ ,  $SD = 6.82$ ), 0 to 39 selfies with a partner ( $M = 1.42$ ,  $SD = 3.69$ ), and 0 to 79 group selfies on Facebook ( $M = 2.2$ ,  $SD = 5.27$ ). Two-tailed independent sample  $t$ -tests ( $\alpha = .05$ ) revealed that women published significantly more selfies of all types than did men (all  $t > 2.9$ ; all  $p < .05$ , see Table 3). Therefore, akin to Study 1, we conducted all subsequent analyses separately for each sex.

Actual number of selfies posted to Facebook and scores in personality measures were not normally distributed (Kolmogorov–Smirnov  $p < .05$ ), therefore we used Spearman's  $\rho$  correlations in our analyses. The results of Study 2 indicated a significant positive correlation between women's extraversion and number of selfies posted with a partner ( $r_s = .11$ ,  $p < .05$ ). Women's social exhibitionism was also

**Table 2**

Correlations (Spearman's  $\rho$ ) between personality characteristics and frequency of selfie-posting to all online social networking sites in Study 1.

	Women ( $N = 355$ )			Men ( $N = 393$ )		
	Extr	SES	Exhib	Extr	SES	Exhib
Own selfies	.15**	-.02	.26**	.22**	.01	.21**
Selfies with a partner	.13*	.10	.16*	.17**	.08	.13*
Group selfies	.24**	-.01	.21*	.26**	.09	.26**

Note: Extr = extraversion; SES = self-esteem; Exhib = social exhibitionism.

Significant Spearman correlation coefficients indicated with \*\* $p < .01$ , \* $p < .05$  (two-tailed).

positively and significantly correlated with all types of selfies posted to Facebook ( $r_s = .13$  to  $.20$ , all  $p < .05$ ). Similar to the results of Study 1, there was no significant relationship between selfies posted online by women and their self-esteem. Women's extraversion significantly and positively correlated with their self-esteem and social exhibitionism ( $r_s = .32$  and  $.36$ , respectively), and their self-esteem did not correlate with reported social exhibitionism.

Among men, extraversion correlated positively and significantly with number of posted selfies with a partner ( $r_s = .18$ ,  $p < .05$ ) and group selfies ( $r_s = .25$ ,  $p < .05$ ). Self-esteem correlated positively and significantly with own selfies ( $r_s = .19$ ,  $p < .01$ ) and men's social exhibitionism correlated with the posting of group selfies ( $r_s = .28$ ,  $p < .01$ ) and own selfies ( $r_s = .14$ ,  $p = .04$ ). Men's extraversion significantly correlated with their self-esteem and social exhibitionism ( $r_s = .33$  and  $.46$ , respectively), and their self-esteem correlated with social exhibitionism ( $r_s = .19$ ).

All correlations among participants' self-reported personality traits and number of all types of selfies posted on Facebook in Study 2 are reported in Table 4.

### 4. Discussion

Online social networking (OSN) sites are used by millions of people each day for a variety of reasons, including communicating with friends and family, business interactions, marketing, obtaining news, and for entertainment (Błachnio, Przepiórka, & Rudnicka, 2013) and can also be used as a tool for self-promotion (Nadkarni & Hofmann, 2012). The aim of the two studies presented here was to explore the characteristics of individuals differing in the degree to which they engage in a relatively new online behavior that may be closely linked to self-promotion, i.e. posting selfies. As predicted, in most cases, extraversion and social exhibitionism correlated positively with men's and women's online selfie-sharing behavior. However, selfie-sharing activity was unrelated to women's self-esteem, and correlated with men's self-esteem only in the case of own selfies shared on Facebook. Thus, our results demonstrate that social exhibitionism and extraversion can predict the quantity of all types of selfies posted by men and women to various social media.

People who demonstrate high exhibitionism typically enjoy attracting attention to themselves, talking about themselves, and often engage in self-disclosure (Murray, 1938). Exhibitionist tendencies are triggered by the presence of an audience (Siek, 1993), therefore other users of OSN sites may be an easily accessible group with whom to share self-related posts and photos. Extraversion might be related to

**Table 1**

Selfies posted by women and men in Study 1 to all online social networking sites. Descriptive statistics and  $t$ -tests comparing quantities of photos shared by each sex.

	Women (N = 355)						Men (N = 393)					
	M	SD	95% confidence interval		M	SD	95% confidence interval		t	df	p	d
			Lower	Upper			Lower	Upper				
Own selfies	6.68	26.64	3.90	9.46	3.26	19.02	1.38	5.15	2.03	746	0.04	0.15
Selfies with a partner	1.21	4.47	0.75	1.68	1.72	7.29	1.00	2.44	−1.13	746	0.26	.08
Group selfies	6.12	23.94	3.62	8.61	2.64	7.05	1.94	3.34	2.75	746	0.01	0.2

**Table 3**Selfies posted by women and men in Study 2 to Facebook. Descriptive statistics and *t*-tests comparing quantities of photos shared by each sex.

	Women ( <i>N</i> = 330)					Men ( <i>N</i> = 218)						
	<i>M</i>	<i>SD</i>	95% confidence interval		<i>M</i>	<i>SD</i>	95% confidence interval		<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
			Lower	Upper			Lower	Upper				
Own selfies	3.42	7.52	2.60	4.23	2.04	5.50	1.30	2.77	2.33	546	0.02	0.20
Selfies with a partner	1.78	4.24	1.32	2.24	0.86	2.57	0.52	1.21	2.87	546	0.00	0.25
Group selfies	2.61	6.09	1.95	3.27	1.57	3.65	1.09	2.06	2.26	546	0.02	0.19

selfie-posting activity for a variety of reasons. The relationships we found were most consistent for partner and group selfies, and as discussed by Gosling and colleagues (Gosling et al., 2011), extraverts are generally more socially active than are introverts (McCrae & Costa, 2003). Posting selfies might also function as a display of willingness to keep friends up-to-date about oneself. Additionally, extraverted people are generally more active users of various OSN sites than are relatively introverted people (Nadkarni & Hofmann, 2012), so it is likely that they are also more active in selfie-posting.

Extraversion predicted selfie-posting behavior to a differing degree in each study, especially in the case of posting own selfies. One explanation of the observed differences is that we measured selfie-related activity in a wide range of social media sites in Study 1, and only on Facebook in Study 2. Previous studies have shown that people differing in levels of extraversion might differentially use various OSN sites. For example, extraverted individuals often use instant messaging compared to other forms of technology (Correa et al., 2010; Ehrenberg, Juckes, White, & Walsh, 2008), and appear to prefer Facebook to Twitter (Hughes, Rowe, Batey, & Lee, 2012). Additional research is needed to determine whether extraversion is a stronger predictor of own selfie-posting activity on various OSN sites compared to Facebook alone, as our research suggests.

Our studies show that women post more selfies than do men, however the number of all types of selfies posted online was unrelated to women's self-esteem. These findings are consistent with those reported by McAndrew and Jeong (McAndrew & Jeong, 2012), who found that women were very active Facebook users, and used profile pictures for impression management more often than did men. While self-esteem seems not to be related to women's tendency for self-promotion, men's self-esteem positively predicted the number of own selfies that they posted to Facebook. Previous work examining relationships between social media and self-esteem has also yielded mixed results (Ehrenberg et al., 2008; Mehdizadeh, 2010; Skues, Williams, & Wise, 2012). It is possible that the differential pattern of results we observed, linking self-esteem to selfie posting in men but not women, is related to the nature of self-esteem. On the one hand, people with high, stable self-esteem might be eager to share their photos because they are not susceptible to criticism (Kernis, Grannemann, & Barclay, 1989). On the other hand, people with low self-esteem might be even more willing to engage in online self-promotion in order to raise their self-esteem (Krämer & Winter, 2008). This area of research requires further investigation.

**Table 4**Correlations (Spearman's *rho*) between personality characteristics and frequency of selfie-posting to Facebook in Study 2.

	Women ( <i>N</i> = 330)			Men ( <i>N</i> = 218)		
	Extr	SES	Exhib	Extr	SES	Exhib
Own selfies	.02	-.10	.13*	.05	.19**	.14*
Selfies with a partner	.11*	.04	.13*	.18**	.08	.04
Group selfies	.10	-.03	.20**	.25**	.10	.28**

Note: Extr — extraversion; SES — self-esteem; Exhib — social exhibitionism.

Significant Spearman correlation coefficients indicated with \*\**p* < .01, \**p* < .05 (two-tailed).

Ours is one of the first studies to examine the phenomenon of selfie-posting from a personality perspective. Although our results offer novel insight into selfie posting behaviors, we are aware of several limitations of our work. First, it is likely that a broader set of personality variables (as well as various other factors unrelated to personality) will further extend our understanding of the individual differences associated with selfie-posting. Judging from the moderate effect sizes observed in our study, additional traits and factors are likely to explain additional variance in this behavior. For example, researchers may explore relationships between selfie posting and each of the Big Five personality dimensions, rather than extraversion alone (McCrae & Costa, 2003). The present study can help to guide the development of future models that may explain selfie-posting behaviors in a more comprehensive manner. Whereas the results of our two studies were largely corroborative, inconsistencies between our two studies should be highlighted. Extraversion predicted the posting of own and group selfies among women, and own selfies among men in Study 1, but not Study 2, whereas self-esteem predicted the number of own selfies posted by men on Facebook only. As noted previously, these differences could result from Study 1 having included all types of social media sites, and Study 2 having included only Facebook. Although Facebook is the most popular OSN site (Wilson et al., 2012), it is possible that people prefer posting their selfies to media other than Facebook. The differences could also stem in part from assessment biases. In Study 1, we measured selfie posting through self-assessment, and self-assessments may be problematic in OSN studies (Junco, 2013). In Study 2, we did not estimate classification reliability, and to avoid privacy setting violations, selfies were counted by one experimenter only. It is possible that both methods introduced some noise into our measurements, and should be addressed in future work.

## 5. Conclusion

The present study is one of the first to investigate the emerging and rapidly increasing social phenomenon of posting selfie photographs to various online social networking sites. Our study provides empirical support that women engage in selfie-posting behavior significantly more often than do men, and that extraversion and social exhibitionism, but not self-esteem, predict online selfie-posting behavior in two large samples of men and women. The results of this work highlight key individual differences among OSN users that can account for some variation in online photo sharing behavior, and may provide insight into the psychological and cultural factors, such as self-promotion and individualism, driving this phenomenon.

## Author disclosure statement

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