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Posting photos on Facebook: The impact of narcissism, social anxiety, loneliness, and shyness

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Abstract

Facebook is the most popular social networking site in the world. It allows its users to present themselves, and interact with each other, in many different ways including sharing personal photos. The current study investigated the influence of social interaction variables shyness, loneliness, and social anxiety, the self-presentation variable narcissism, and Facebook users' age on photo sharing. Within this we focused on the nature and frequency of posting photos, and how often these were interacted with. These variables have previously been investigated separately but not together. A total of 264 participants, 75 males and 189 females, ranging in age from 16 to 72 years (M=31.65, SD=13.24) answered an online questionnaire about Facebook use and individual difference characteristics. The kinds of photos posted were categorized as family, significant-other, friends, pets, oneself, parties, travel, sport, food, achievements, and other. Results revealed that time spent on Facebook, age and narcissism impacted positively, and loneliness and shyness impacted negatively, on the frequency of posting of some categories of photos online. Future research should extend the study of the impact of these social and self-presentation variables on Facebook behaviours.

1. Introduction

Social networking sites (SNSs) have rapidly expanded since their inception in the early 2000s. Facebook, founded in 2004, has approximately 1.65 billion active users and is officially the world's largest SNS (Statista, 2016). Its recent growth has consisted largely of younger users (Rose, 2014). A user's age is indicative of how they use SNSs, with younger users spending more time on sites, more likely to engage with activities such as photo-posting (with the exception of family photos) and impression management (McAndrew & Jeong, 2012), and more likely to utilize Facebook for social (vs. informational) purposes (Hughes et al., 2012).

Social media are used primarily for interacting with other users by sharing and posting comments, linking with other people, and uploading photos (Garcia & Sikstro, 2014). The widespread availability of mobile devices with built-in cameras has enabled SNS users to capture and document significant life moments and share these with others by posting photos online (Eftekhar, Fullwood, & Morris, 2014). Users are estimated to upload over 2 billion photos to Facebook per month (Stefanone, Lackaff, & Rosen, 2011).

With photos becoming an increasingly utilized tool in online communication, self-presentation, and self-promotion (e.g., Eftekhar et al., 2014), and with the weight they carry in impression formation (e.g., Scott & Hand, 2016), it is important to understand how SNS users interact with this media and why individuals post photos online.

Recognising that online behaviours may reflect personality characteristics offline, researchers have studied how individual differences influence the utilization of different Facebook functions. Eftekhar et al. (2014) found that extraversion predicted having more friends, photo uploads and cover photos, while neuroticism predicted more photo uploads and photo albums. However Ross et al. (2009, p. 578) found that the traditional big five personality variables were "not as influential as previous literature would suggest" in predicting Facebook use. This led researchers to examine individual difference variables that might be more salient in explaining variation in uptake of Facebook features, such as their

utilization for self-presentation (Zhao, Grasmuck, & Martin, 2008), belonging, and social interaction (Seidman, 2013). Recent studies have examined narcissism as a self-presentation variable that impacts Facebook use (e.g., Ryan & Xenos, 2011), as well as variables reflecting difficulties in social interactions and relationships, such as shyness, loneliness and social anxiety.

Narcissism is a personality trait typical of individuals with an over-inflated understanding of their own importance or value (Krishnan & Atkin, 2014). Narcissists derive gratification from attracting admiration from others and enjoy using Facebook as it satisfies their need to engage in self-promotion (Ryan & Xenos, 2011). Facebook users with high narcissism scores are more likely to share self-promoting posts and photos, believing other users find information about them interesting (Buffardi & Campbell, 2008). Narcissism is significantly positively correlated with frequency of posting photos of oneself (Bergman, Fearrington, Davenport, & Bergman, 2011), but not with posting photos in general (Buffardi & Campbell, 2008). This suggests narcissists prefer the features of Facebook that afford self-promotion (e.g., updating Facebook status, changing profile photo) rather than posting photos in general. This demonstrates that considering 'photo posting' behaviour online as a single category may be too general, and that users may be more or less likely to post different categories of photo based on the intended outcome. Given their self-absorption, narcissists may be more likely to post "selfies" and other categories of photo relating to self-promotion.

Shyness is a factor that inhibits people from engaging in face-to-face social situations (Zimbardo, Pilkonis, & Norwood, 1974). SNSs are attractive to shy people, as there is no face-to-face interaction involved in online settings, making them feel more secure (Stritzke, Nguyen, & Durkin, 2004). Shy individuals enjoy some aspects of Facebook (e.g., sharing photos, videos, and updating status) however they tend to reveal less personal information online, compared to less shy individuals. The number and type of photos shy users share has not been investigated. Previous findings suggest that Facebook fails to facilitate intimate

contact between shy users, creating false illusions of close friendships (Sheldon, 2013). Shy individuals may be less likely to post photos containing personal information, but be equally likely to post other categories of photos. They may also be less likely to comment on others' photos.

Loneliness refers to a negative emotion experienced when there is a perceived inconsistency between one's desired and experienced interpersonal relationships (Jin, 2013). Approximately 20% of individuals report loneliness as a major source of unhappiness (Cacioppo & Patrick, 2008). One theory suggests that lonely people tend to avoid engaging in SNSs due to poor social abilities (Correa, Hinsley, & de Zúñiga, 2010), while another argues that lonely people enjoy using SNSs, viewing them as useful sources of interaction (Morahan-Martin & Schumacher, 2003). Lonelier users tend to spend more time on Facebook in an attempt to find companionship and emotional support (Ehrenberg, Juckes, White, & Walsh, 2008), but have fewer online friends and disclose less personal information compared to less lonely individuals (Sheldon, 2013). This suggests lonely individuals have concerns about online self-disclosure but to our knowledge no study has investigated the effect of loneliness on photo sharing. Lonely individuals may share fewer photos, particularly those categories relating to self-disclosure, but loneliness may not impact on commenting on others' photos.

Social anxiety is defined as fear or embarrassment in social situations, which is related to fear of being judged (Murphy & Tasker, 2011). Socially anxious individuals feel uncomfortable or distressed in social situations, potentially leading to social withdrawal and eventual impairment of behaviour in face-to-face interactions. Individuals with high levels of social anxiety may compensate for their offline difficulties by engaging in interactions online (Gosling, Augustine, Vazire, Holzman, & Gaddis, 2011). Alternatively, those with high social anxiety tend to disclose less personal information online (Bonetti, Campbell, & Gilmore, 2010), suggesting they are less likely to post photos of any type, or to comment on others' photos.

The aim of the current study was to further examine the impact of these individual difference variables, as well as age and time spent on Facebook, on behaviours related to posting photos on Facebook. Specifically, we investigated not just how likely individuals were to post photos on Facebook, but the likelihood, and frequency, of different categories of photos being posted, and users' likelihood of commenting on others' photos. Eleven photo categories were identified: family, significant-other, friends, pets, parties, self, travels, sports, food, achievements and other. We predicted that the individual difference variables would impact on posting photos of different categories, with narcissism positively predicting posting self-promoting photos such as selfies, shyness negatively predicting both posting personal photos and also commenting on others' photos, and loneliness negatively predicting photo-posting behaviour, particularly of personal photos. We also predicted that that age (negatively) and time on Facebook (positively) would predict photo-posting behaviour.

2. Method

2.1 Design

A cross-sectional design examined participants' Age, time spent on Facebook daily (Time), and the personality variables: Narcissism, Shyness, Loneliness, and Social Anxiety on their photo posting behaviour – both whether or not they post photos (Likelihood) and how often they posted photos (Frequency) – on Facebook for photos of different categories: family significant other, friends, pets, parties, selfies, travel, sports, food, achievements, and 'other'.

2.2 Participants

A total of 264 participants, 75 males and 189 females ranging in age from 16 to 72 years (M=31.65, SD=13.24) took part. All indicated on a yes/no question that they currently have a Facebook account. The majority of participants were British (78.2%), 17.7% were White European, 2.0% were White North American, and 1.4% of participants identified as mixed

race. All participants were recruited via adverts on Facebook and Twitter and completed the

questionnaire voluntarily.

2.3 Materials

Participants completed a questionnaire that asked about their Facebook behaviours

and individual difference variables: Narcissism, Shyness, Loneliness, and Social Anxiety.

2.3.1 Facebook behaviours

The Facebook section of the questionnaire asked how much time participants spent

on Facebook daily and how often they posted photos in 11 categories identified by the

researchers: family, significant-other, friends, pets, parties, self, travels, sports, food,

achievements and other. Frequency of posting was measured on a nine-point scale from "Less

than once per year" (1) to "More than once daily" (9). A mean frequency of posting score

across the categories was also derived. Participants were also asked about their frequency of

commenting on others' pictures, using the same scale.

2.3.2 Personality measures

The Narcissistic Personality Inventory Version 3 (Ames et al., 2006) is a short 16-item

measure of narcissism. It consists of pairs of statements, one narcissistic and the other not,

from which participants are required to select the one that best applies to them, their final

score being a sum of their narcissistic choices (out of 16). The Revised Cheek and Buss

Shyness Scale (Cheek & Briggs, 1990) was used to measure shyness (Cronbach's α = 0.898).

The total score was the mean of 13 items answered on a 5-point Likert scale. The UCLA

Loneliness Scale version 3 (Russell et al., 1978) was used to measure loneliness (Cronbach's

α = 0.963). The total score was the sum of a 20-item questionnaire with items answered on a

4-point scale (0-3). Social anxiety was measured using the 24 item Liebowitz Social Anxiety

Scale (Liebowitz, 1987), with total score a sum of the avoidance and fear/anxiety of

situations subscales. Participants indicated the level of anxiety they experienced in different

situations, such as "Entering a room when others are already seated." on a 4-point Likert Scale (Cronbach's α = 0.994).

2.4 Procedure

The questionnaire was presented via the online survey tool SurveyMonkey which participants accessed via links on Facebook and Twitter. To ensure anonymity, participants entered a unique identifier before beginning the questionnaire, which took approximately 15 minutes to complete.

3. Results

We began by examining photo posting behaviour on Facebook [3.1]. We then examined the individual differences of our participants: Narcissism, Shyness, Loneliness, and Social Anxiety [3.2], and their predictive value relating to likelihood [3.3] and frequency of posting Facebook photos of different categories [3.4]. Finally, we examined participants' comments on others' Facebook photos [3.5].

3.1 Time Spent on Facebook and Posting Facebook Photos

Participants spent 76.4 minutes per day on average on Facebook, although there was a lot of variability in this (SD=59.7). Over half the participants, 56.1%, spent between half an hour and 3 hours per day on Facebook, with 30.1% of participants spending less than half an hour a day, and 13.7% using Facebook for more than three hours every day. Age was negatively correlated with minutes on Facebook (r=-.215, $p<0.001$). 86% of participants posted photos of travel and 85.2% posted photos of friends with only 36.4% posting photos of food. Photos of friends, family, self and parties were posted most frequently and photos of sporting events and food least often. A mean frequency of photo posting, derived from

Table 1: Descriptive data and inter-correlations for frequency of photos posted in different categories

	Mean	SD	Family	Significant other	Friends	Pets	Parties	Self	Travel	Sport	Food	Achievements	Other
Family	2.86	1.88	1	.659**	.600**	.415**	.480**	.451**	.394**	.396**	.434**	.417**	.263**
Significant other	2.41	1.90		1	.499**	.483**	.462**	.405**	.407**	.409**	.424**	.456**	.291**
Friends	3.16	1.82			1	.491**	.740**	.661**	.521**	.426**	.531**	.576**	.288**
Pets	2.30	2.11				1	.430**	.392**	.442**	.396**	.549**	.496**	.373**
Parties	2.69	1.86					1	.632**	.591**	.508**	.517**	.534**	.260**
Self	2.72	1.82						1	.531**	.412**	.505**	.489**	.271**
Travel	2.42	1.55							1	.490**	.526**	.575**	.295**
Sporting events	1.73	1.67								1	.524**	.505**	.323**
Food	1.87	1.78									1	.681**	.362**
Achievements	1.98	1.63										1	.461**
Other	2.06	2.10											1

***significant at the 0.001 level (2-tailed)
**significant at the 0.01 level (2-tailed)
*significant at the 0.05 level (2-tailed)

the mean number of photos participants posted across all 11 categories, was 2.38 (SD=1.31) suggesting that, on average, Facebook users posted photos on Facebook less than once a month. The correlations between posting frequency for each category are presented in Table 1.

The diversity of the photos, i.e., the mean number of different categories of photos that participants posted across, was 6.81 (SD=2.74). Regression of the individual differences variables, age and time spent on Facebook on photo diversity revealed a significant effect ($F_{(6,259)}=5.72$, $p<.001$) that explained 9.9% of the variance. Age was a negative predictor ($\beta=-.207$, $t=-3.33$, $p<.001$) and Time a positive predictor ($\beta=.206$, $t=3.33$, $p<.001$), showing that younger people and those spending more time on Facebook post photos across more categories.

3.2 Individual difference variables

Table 2 shows correlations between the individual difference variables Narcissism, Social Anxiety, Shyness, and Loneliness. Medium to strong positive correlations were found between all three "social" variables with the strongest link between Shyness and Social Anxiety, and weaker, but still moderate links between Loneliness and Shyness, and between Loneliness and Social Anxiety. Weak negative correlations were found between Narcissism and both Shyness and Social Anxiety, suggesting that those who are more concerned with self-presentation are less shy and socially anxious.

Table 2: Descriptive data and Inter-correlations between individual difference variables (N = 264)

	Mean	SD	Narcissism	Social Anxiety	Loneliness	Shyness
Narcissism	3.3	2.92	1	-.287**	-.022	-.293**
Social Anxiety	1	0.58		1	.499**	.754**
Loneliness	2.9	0.85			1	.540**

Shyness	2.5	0.77				1

***significant at the 0.001 level (2-tailed)
**significant at the 0.01 level (2-tailed)
*significant at the 0.05 level (2-tailed)

3.3 Likelihood of posting Facebook photos of different categories

A series of binary logistic regressions was carried out on each category of photo, based on whether participants indicated they posted photos of each category or not, with Age, Time, Narcissism, Loneliness, Social Anxiety, and Shyness as predictor variables. The Nagelkerke R^2 values indicated that for each category of photo the predictor variable explained between 2.8% (sports) and 23.3% (parties) of the variance. Loneliness and Narcissism both negatively predicted likelihood of posting photos of the category Family and Significant Others, while narcissism positively predicted likelihood of posting photos of the category Pets. Both Age (negatively) and Time (positively) predicted likelihood pf posting photos in a number of categories, while Social Anxiety and Loneliness were never significant predictors (*ps*>0.05). The results are presented in Table 3.

Table 3: Binary logistic regressions of Age, Time and personality variables on Likelihood of posting photos.

	Nagelkerke R^2	Age		Time		Narcissism		Loneliness	
		Exp(B)	p	Exp(B)	p	Exp(B)	p	Exp(B)	p
Family	.125	.985	.192	1.007	.018*	-.0881	.017*	-.966	.006**
Sig Other	.154	-.952	.000***	1.001	.752	-.895	.025*	-.974	.027*
Friends	.153	-0.959	.001**	1.010	.005**	-.991	.893	-.978	.127
Pets	.106	-.983	.104	1.006	.016*	-1.115	.028*	-.990	.382
Parties	.233	-0.952	.000***	1.012	.000***	-.978	.696	-.976	.063
Selfie	.124	-0.964	.001**	1.005	.117	1.015	.801	1.001	.931
Travel	.069	-.980	.068	1.005	.058	-.941	.263	-.990	.421
Sports	.028	1.007	.483	1.002	.309	1.021	.667	-.984	.173
Food	.088	1.003	.792	1.006	.012*	1.095	.062	1.008	.476
Achieve	.131	-0.971	.004**	1.008	.001**	1.006	.911	-.994	.625
Other	.048	0.998	.860	1.002	.387	1.086	.084	-.986	.190

***significant at the 0.001 level (2-tailed)
**significant at the 0.01 level (2-tailed)

*significant at the 0.05 level (2-tailed)

3.4 Frequency of posting Facebook photos of different categories

To establish whether Age, Time and the individual difference variables predicted the frequency of posting of the 11 photo categories, as well as the mean frequency of posting across the categories, 12 separate linear regressions were carried out (Table 4). Using the enter method, significant regression models were found for the frequency of posting of all categories of photograph as well as for mean frequency of posting. Time was a predictor of the frequency of posting across all photo categories, except significant other where it was a marginal predictor, while Age was a significant negative predictor of posting in the categories significant other, friends, parties/nights out, self and achievement. Narcissism was a significant predictor of the frequency of posting of photos of pets, travel, sport, food, achievement and other. Shyness was a negative predictor of photos of parties and self; Loneliness was a negative predictor of photos of friends and a marginal negative predictor of family, significant other, parties and sport; Social Anxiety was a marginal positive predictor of parties, travel and mean frequency of posting.

3.5 Commenting on others' Facebook Photos

The average number of comments on others' Facebook photos was 4.30 (SD=2.20), showing that on average Facebook users comment on others' photos between once and twice a month. A regression of the individual differences variables, Age and Time on number of comments revealed a significant effect $(F_{(6,258)}=2.24, p=.04)$ that explained 2.8% of the variance. Time was a positive predictor $(\beta=.201, t=3.19, p=.005)$ and loneliness a negative predictor $(\beta=-.190, t=-2.53, p=.049)$, of number of comments, indicating that people who spent more time on Facebook commented more, and lonelier people commented less.

Table 4: Standardised regression coefficients of regressing Age, Time, and personality variables on photo posting Frequency.

	Family	Significant Other	Friends	Pets	Parties	Self	Travel	Sport	Food	Achieve-ment	Other	Mean frequency
Narcissism	.023	-.04	.067	.202**	0.57	0.54	.153*	.172**	.166**	.173**	.142*	-.146
Social Anxiety	.072	.034	.128	.049	.154	.147	.164	.098	.107	.110	.181	.156
Loneliness	-.146	-.128	-.173*	-.050	-.132	-.016	-.001	-.138	-.024	-.047	-.088	-.121
Shyness	-.081	-.112	-.108	-.087	-.184*	-.203*	-.090	-.090	-.013	-.062	-.006	-.110
Age	.022	-.224***	-.185**	-.042	-.240***	-.173**	-.091	-.010	-.040	-.143*	-.006	-.144*
Time	.209***	.120	.251***	.246***	.274***	.259***	.188***	.137*	.278***	.275***	.174**	.305***
Adjusted R²	.024**	.074***	.124***	.093***	.169***	.118***	.072***	.048**	.101***	.134***	0.48**	.154***
F	2.9	4.45	7.12	5.4	9.77	6.79	4.36	3.17	5.86	7.66	3.2	8.84

***significant at the 0.001 level (2-tailed)
**significant at the 0.01 level (2-tailed)
*significant at the 0.05 level (2-tailed)

Facebook users commented on others' postings more frequently than they posted their own photos, but there was a weak positive correlation between the mean frequency of posting photos and the frequency of commenting on Facebook photos (r=.137, p=0.027) and between the diversity of photos posted and the frequency of commenting on Facebook photos (r=.166, p=0.007). There was a weak negative correlation between loneliness and commenting indicating that lonelier people comment less on others' photos (r=-.164, p=0.038).

4. Discussion

This study examined photo posting behaviour on Facebook. Specifically, we aimed to expand on previous research by investigating not just how often users posted photos, but how often they posted different categories of photos, and how age, time spent on Facebook, and the individual difference variables narcissism, social anxiety, loneliness and shyness predicted these behaviours. The current study confirmed previous findings (Hughes et al., 2012) that Facebook users are spending substantial amounts of time on Facebook (over 1¼ hours per day on average). Users generally posted photos across several different categories, although posting photos was an infrequent activity (typically fewer than one photo per month). The more time people spent on Facebook and the

younger they were, the more photos they posted and the more likely they were to post photos of different categories. Younger people posted more photos of significant others, friends, parties, self, and achievement, indicating the greater importance of these issues and events for younger than older users.

Although they were all correlated (with the exception of narcissism), individual differences impacted in different ways on posting photos on Facebook. Consistent with Bergman et al. (2011), narcissists more frequently posted photos that reflected their achievements. In the current study they also posted photos of pets, food, travels and sport more frequently. Presumably narcissists think that these photos displaying their material possessions and experiences portray them in a good light. In contrast with Bergman et al. (2011), narcissists did not post more photos of themselves in the current study. Conceivably narcissists prefer to post photos that display their assets and capabilities more implicitly, or this difference may relate to the way in which participants mentally categorised photos. For example "selfies" frequently include family, friends or parties and consequently may not be categorised as "self". Narcissists' online behaviours seem to reflect their behaviours offline: they use SNSs as another medium for self-promotion, displaying themselves positively and seeking recognition.

The social variables, shyness, loneliness and social anxiety were only weakly linked to posting photos of people. Participants scoring higher on loneliness were less likely to post photos of family and significant other, posted photos of friends less frequently, and photos of family, significant other, parties and sport marginally less frequently. They were also less likely to comment on others' photos. This probably reflects their relative lack of real-life relationships with fewer opportunities to take such photos (Jin, 2013). These results support Ryan and Xenos (2011) who found that lonely people were more likely to use passive features of Facebook which require no social interaction (e.g., liking, playing games) than active features (e.g., sharing, communicating with other users).

Socially anxious people find face-to-face interactions more stressful than others, but spending more time on Facebook suggests a desire to connect with others and form and maintain relationships online. Social anxiety marginally predicted photo posting frequencies in the current study. Murphy and Tasker (2011) offer a plausible explanation of why socially anxious individuals spend time on Facebook: they find it easier to communicate in online settings, and are more comfortable sharing information in such domains than in face-to-face settings. This encourages them to be more engaged in social situations online, but in a safe way that can help to combat feelings of social anxiety (Ledbetter et al., 2011). Socially anxious individuals are keen to be connected with others, but may use social media as a substitute for real life (Gosling et al., 2011). Although apparently similar, shyness and social anxiety seem to operate in different ways online. While socially anxious individuals use Facebook in an active and positive way, shy individuals posted fewer photos of parties and self, probably reflecting their lack of opportunities, a lack of confidence in themselves and less desire to stay connected (Sheldon, 2013).

The weak positive correlation between commenting on, and posting, photos suggests that those who engage in one activity also tend to engage in the other, although commenting was more prevalent then posting. For the social interaction variables there were also similarities between users' likelihood to, and frequency of, posting photos, with frequency apparently a more sensitive measure. Neither shyness nor social anxiety, for example, predicted likelihood of posting in any category, but shyness negatively predicted frequency of posting parties and self photos. Loneliness predicted likelihood and frequency of posting family and significant other photos, and also frequency of posting pets and sports. An explanation for this could be one of opportunity – lonely individuals are less likely to be in social situations to post certain categories of photos, but equally likely to post when they are. Whereas frequency and likelihood results were similar for the social interaction variable, a discrepancy manifested with narcissism as a predictor.

Narcissism positively predicted frequency of posting a range of self-promoting photos, but negatively predicted likelihood of posting family and significant other, demonstrating that narcissists post more of self-promoting photos, but are more likely to neglect other categories altogether.

4.1 Limitations and future research

A limitation of the current study was the absence of definitions of the different photo categories which may have led to inconsistent responses by participants. For example, some participants may have understood achievements as winning material awards, whereas others may have interpreted it as achieving a personal goal. Similarly, there were potential overlaps between categories, e.g., selfies – photos of oneself – and family, friends or parties, which may include oneself as part of a group. Future research could provide definitions in order to reduce potential conflicts in understanding. Future research could also examine gender differences in online photo posting behaviour.

4.2 Conclusion

The current study demonstrates that age, time, narcissism, social anxiety, shyness and loneliness are salient variables in predicting self-presentation photo-posting behaviours on Facebook, but influence these in different ways. Younger people spent longer on Facebook and posted more photos of important people and events. Narcissistic individuals posted more photos of their possessions and experiences, probably in an attempt to gain recognition, while also neglecting other less self-promoting categories of photo. Socially anxious individuals spent more time on Facebook and posted more photos online as they find the online environment more comfortable than the real world for social interaction. Lonely people posted fewer pictures of friends, probably reflecting a lack of real life relationships, while shy people posted fewer pictures of parties and self. Future research should extend the study of the impact of these social and self-presentation variables on Facebook behaviours and look at motives.

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