

Social Media Use Predicts Greater Liking in In-Person Initial Interactions

Jennifer L. Heyman¹ , Lauren Gazzard Kerr¹,
and Lauren J. Human¹

Personality and Social
Psychology Bulletin
2022, Vol. 48(9) 1393–1405
© 2021 by the Society for Personality
and Social Psychology, Inc



Article reuse guidelines:
sagepub.com/journals-permissions
DOI: 10.1177/01461672211040964
journals.sagepub.com/home/pspb



Abstract

Does how people generally engage with their online social networks relate to offline initial social interactions? Using a large-scale study of first impressions ($N = 806$, $N_{dyad} = 4,565$), we examined how different indicators of social media use relate to the positivity of dyadic in-person first impressions, from the perspective of the participants and their interaction partners. Many forms of social media use (e.g., Instagram, Snapchat, passive) were associated with liking and being liked by others more, although some forms of use (e.g., Facebook, active) were not associated with liking others or being liked by others. Furthermore, most associations held controlling for extraversion and narcissism. Thus, while some social media use may be generally beneficial for offline social interactions, some may be unrelated, highlighting the idea that how, rather than how much, people use social media can play a role in their offline social interactions.

Keywords

social media, impressions, liking, extraversion, narcissism

Received January 12, 2021; revised accepted July 31, 2021

Introduction

In the technological era, people spend an increasing amount of time on social media sites like Facebook and Instagram. Many people use these sites to foster communication and connection with others via online mediums (Subrahmanyam et al., 2008; Whiting & Williams, 2013; Wooley, 2013), but many people have raised concerns about whether social media may have negative implications for in-person social interactions (Allen, 2019; Drago, 2015; Geladi, 2018). Indeed, there is evidence that internet use is associated with social inhibition and lower levels of rapport and likeability (Iacovelli & Valenti, 2009). Yet, some forms of social media use appear to have more positive links with offline social experiences. For example, greater instant messaging and Facebook use has been shown to increase offline friendship initiation (Koutamanis et al., 2013; Metzler & Scheithauer, 2017). To address these divergent findings, Clark and colleagues (2018) argue that using social media to connect with others is beneficial for well-being and interpersonal closeness, whereas use that is associated with isolation and comparison is more detrimental. In the present study, we sought to extend this research by examining whether general social media use relates to experiences during getting-acquainted face-to-face interactions. Specifically, does how we use social media in our daily lives relate to the first impressions we make of and have on others during in-person interactions?

We examined this question with a large-scale study of getting-acquainted interactions ($N = 806$, $N_{dyad} = 4565$) by exploring whether different types of social media use relate to the positivity of initial social interactions, indexed by how much people like and are liked by others. Specifically, we focused on several forms of social media, including the frequency with which people use various sites (e.g., Facebook, Instagram, Snapchat), the size of people's online social networks, and how actively and passively people engage in social media use. Furthermore, we examined the role of relevant personality traits (i.e., extraversion and narcissism) in the associations between social media use and social interactions. Specifically, does social media use relate to liking others and being liked by others because of these personality traits? Or do links emerge above and beyond any associations with extraversion and narcissism? Capitalizing on the dyadic nature of first impressions, we examined how different types of social media use relate to how much people like others as well as how much people are liked by others, thus providing a unique opportunity to extend beyond only self-reports of social experiences.

¹McGill University, Montreal, Quebec, Canada

Corresponding Author:

Jennifer L. Heyman, Department of Psychology, McGill University, 2001 McGill College Avenue, Montreal, QC, Canada H3A 1G4.
Email: jennifer.heyman@mail.mcgill.ca

Social Media Use and Positive Social Interactions

Types of social media use. If trait-level social media use does relate to initial social interactions, would this link be more positive, indicated by greater liking in in-person interactions? One possibility is that people who use social media more may have stronger social skills and confidence, which could in turn contribute to more positive interactions. This could be because greater social media use contributes to social skills and engagement (Heiberger & Harper, 2008; Waytz & Gray, 2018) or because people who have stronger social skills and are more socially engaged also tend to use social media more (Gosling et al., 2011; J. Kim et al., 2009). Of note, only some types of social media use may be linked to stronger social skills and, in turn, positive social interactions. Specifically, more socially oriented use, such as using social media to connect with other people, tends to be associated with positive experiences, including greater engagement in college life (Heiberger & Harper, 2008), greater communication (Y. Kim et al., 2016), greater social involvement (Waytz & Gray, 2018), and greater well-being (Clark et al., 2018).

In addition, more active social media use, defined as using social media to create content and interact with friends (Gerson et al., 2017), is associated with more positive social experiences such as increased social capital (Burke et al., 2010; Ellison et al., 2007; Verduyn et al., 2017), connectedness (Grieve et al., 2013; Verduyn et al., 2017), and social (C. Y. Liu & Yu, 2013). While most of the previous research on passive social media use, defined as using social media to consume but not create content (Burke et al., 2011), has found negative associations with social experiences (see below), some research has found passive social media use is associated with increased social engagement (MacKay et al., 2019). Thus, some aspects of social media use, such as socially oriented and active use, tend to be associated with more positive social experiences. It could be that these indicators of social media use will also be associated with more positive in-person interactions, as indicated by liking and being liked more by others. Furthermore, most of the previous studies have used self-reports of both social media and offline experiences. The current study expands upon this by using both self-ratings (liking others) and other-ratings (being liked by others) of liking to circumvent self-report biases and shared-method variance.

The role of personality. Importantly, if these aspects of social media use are linked to more positive in-person interactions because of greater social skill and engagement, it is possible that it is not social media use per se that is relevant but rather personality traits related to more engaging social behavior that explain these links. In the present study, we examined the role of two personality traits that could underlie such links: extraversion and narcissism. Extraversion and narcissism are two of the most frequently examined and significant

predictors of both social media use and social outcomes in in-person interactions (Amichai-Hamburger & Vinitzky, 2010; Amiel & Sargent, 2004; Back et al., 2013; Chen & Marcus, 2012; Hamburger & Ben-Artzi, 2000; Kraut et al., 2002; Küfner et al., 2013; Kuo & Tang, 2014; Leckelt et al., 2015, 2018; Ross et al., 2009; Ryan & Xenos, 2011; Tosun & Lajunen, 2010; Wyatt & Phillips, 2005). For example, extraversion, which includes being more outgoing and talkative, is associated with both offline and online positive social experiences, such as greater offline and online civic engagement (Elshaug & Metzger, 2001; Kavanaugh et al., 2005; Russo & Amnå, 2016) and communication (Akert & Panter, 1988; Seidman, 2013). Similarly, narcissism, defined as having an excessive positive self-image, feelings of superiority, and desire for admiration (Bosson et al., 2008; Morf & Rhodewalt, 2001), has been linked to indicators of more positive social media use, such as having more friends on social media (McKinney et al., 2012), and more positive, charming social behavior, particularly for more agentic aspects of narcissism such as narcissistic admiration (Back et al., 2013; Küfner et al., 2013; Leckelt et al., 2015, 2018).

Overall, people who are more extraverted or narcissistic may use social media in more adaptive ways, which in turn may explain any links between social media and more positive getting-acquainted interactions. As such, we examined whether various indicators of social media use were related to both liking and being liked because of these personality traits, or if these links emerged above and beyond these traits, indicating an independent role of social media use in in-person interactions¹.

Social Media Use and Negative Social Interactions

Types of social media use. There is evidence that some types of social media use have more negative links with social experiences. For example, problematic or excessive internet use has been associated with lower quality relationships (C. Y. Liu & Kuo, 2007; Milani et al., 2009) and increased loneliness (Caplan, 2006; J. Kim et al., 2009). Passive social media use has been associated with more problematic social experiences, including increased loneliness (Burke et al., 2010) and envy (Krasnova et al., 2013; Verduyn et al., 2015, 2017). Although the majority of research has shown active social media use to be associated with positive social experiences (see above), there may also be a dark side to active use, as it has been shown to be associated with greater social comparison (Vogel et al., 2015). Overall, people who engage in higher levels of social media use or more passive use may have less pleasant initial social interactions, perhaps because their attention may still be focused on their technological lives (i.e., fear of missing out [FOMO]; Rifkin et al., 2015) or because of broader social difficulties that contribute to or result from these types of social media use, such as social anxiety (Caplan, 2006). Indeed, Clark and colleagues (2018)

argue that social media use that relates to isolation and social comparison tends to be more detrimental. As such, it is possible that these indicators of social media use would relate to liking others and being liked less in initial interactions.

The role of personality. As with the potentially positive links with social media use, the negative links could also be driven by relevant personality traits. Indeed, low levels of extraversion and high levels of shyness have been associated with more passive (Ryan & Xenos, 2011) and addictive (Chak & Leung, 2004; Satici, 2019; Huang & Leung, 2009) social media use. Similarly, narcissism, specifically more antagonistic aspects such as narcissistic rivalry, is associated with problematic social media use, although more agentic aspects of narcissism have been shown to be associated with problematic social media use as well (Savci et al., 2019). Perhaps social media allows narcissists to present their most favorable characteristics to a large audience (Andreassen et al., 2017) while also increasing feelings of inferiority in their rivals (Seidman et al., 2019). Furthermore, low extraversion and high narcissistic rivalry have been shown to be associated with more negative social experiences, including social withdrawal (Coplan & Armer, 2007), negative social evaluations (Hendrick & Brown, 1971) and being liked less in in-person interactions (Küfner et al., 2013; Leckelt et al., 2015). Thus, we also examined whether narcissism and (low) extraversion played a role in any negative links between social media use and in-person interactions.

The Present Study

Overall, some forms of social media use may be related to more positive initial interactions because of greater social skill and engagement, whereas other forms of use may be related to more negative initial interactions because of more social difficulties or preoccupation with online social worlds. We assessed these possibilities by examining whether each type of social media use was related to how much people liked and were liked by new acquaintances, above and beyond the role of relevant personality, namely extraversion and both the admiration and rivalry components of narcissism.

Importantly, most research examining social media has focused on general use (Longstreet & Brooks, 2017; Whang et al., 2003) or one specific social media site (Hong et al., 2014; Kircaburun & Griffiths, 2018; Punyanunt-Carter et al., 2017; Ryan et al., 2014), but people use different social media sites for different reasons (Alhabash & Ma, 2017), which may result in different links with in-person interactions. Therefore, we extended prior research by examining multiple social media sites (i.e., Facebook, Instagram, and Snapchat) to parse out differences between these sites. Moreover, we examined additional aspects of social media use, including social network size, active use, and passive use.

We also extended prior research by examining in-the-moment indicators of social experiences, specifically liking during in-person social interactions, rather than indexing offline social experiences with global self-reports of social and psychological well-being. Furthermore, little work has examined the links between social media use and interpersonal experiences from the perspective of interaction partners (but see Gosling et al., 2007; Vander Molen et al., 2018), relying predominantly on self-reports to assess both online and offline social experiences, therefore raising the issues of shared method variance and reporting biases. Thus, examining whether social media relates not only to one's liking of others but also how much a person is liked in naturalistic interactions, while controlling for relevant personality traits, provides a strong test of whether social media use is related to the positivity of in-person social interactions.

Analyses conducted in the present research were exploratory and not pre-registered. De-identified data as well as the code used for analyses can be found on the Open Science Framework (<https://osf.io/qu8gn/>). We state all data exclusions, analyses conducted, and variables pertaining to the present research questions. Additional variables collected in this study can be found in the study codebook provided on OSF.

Study

Methods

Procedure. Participants completed an online questionnaire assessing their personalities, including extraversion. They were then brought into the lab in groups of 4–8 where they engaged in a round-robin design, whereby each participant met with each group member for a 2-min, one-on-one unstructured interaction, after which participants rated how much they liked each other. This process was repeated until all participants interacted with every other group member. The participants completed another questionnaire assessing their social media use and other individual difference measures, including narcissism.

Participants. A total of 863 undergraduate students participated in this study. Only previously unacquainted individuals were included in the analyses, and we excluded those who did not complete the social media, personality, or liking items. This resulted in a final sample size of 806 participants ($N_{\text{dyad}} = 4,565$, $M_{\text{age}} = 20.36$, $SD_{\text{age}} = 2.21$, 124 males, 670 females, 12 other).

Measures

Types of social media use. Social media was assessed with several items from the Media and Technology Usage and Attitudes Scale (MTUAS; Rosen et al., 2013). Three items were used to assess the frequency of which participants

Table 1. Descriptive Statistics for Types of Social Media Use.

Social Media Indicator	<i>M</i> (<i>SD</i>)	Range
Facebook	6.87 (1.65)	1–10
Instagram	5.99 (2.67)	1–10
Snapchat	5.63 (2.87)	1–10
Social Network Size	6.06 (1.55)	1–8
Active Use	2.08 (1.14)	1–10
Passive Use	6.31 (1.47)	1–10

use social media sites: “How often do you use Facebook/Instagram/Snapchat” using a 1 (*never*)–10 (*all the time*) scale ($M_{\text{Facebook}} = 6.87$, $SD_{\text{Facebook}} = 1.65$; $M_{\text{Instagram}} = 5.99$, $SD_{\text{Instagram}} = 2.67$; $M_{\text{Snapchat}} = 5.63$, $SD_{\text{Snapchat}} = 2.87$; see Table 1).² We also assessed two facets of the size of online social networks: the subjective amount of Facebook friends using the item “I have a lot of friends on Facebook” using a 1 (*disagree strongly*) to 7 (*agree strongly*) scale ($M = 5.11$, $SD = 1.42$) and the concrete number of Facebook friends using the item “How many friends do you have on Facebook” using a 1 (0) to 9 (751 or more) scale ($M = 7.02$, $SD = 1.97$).

Finally, to assess active and passive use, we asked participants to rate seven items to assess the extent to which they engage in activities such as “Post photos” and “Click like” on social media using a 1 (*never*) to 10 (*all the time*) scale.

To reduce the number of social media items, we ran an exploratory factor analysis on the two social network size items and the seven items assessing active and passive use. Three distinct factors emerged: (a) social network, which references the size of people’s online social networks with both the objective and subjective measure ($\alpha = .76$), (b) active social media use, indicating the extent to which people share and post photos and statuses on social media ($\alpha = .69$), and (c) passive social media use, indicating the extent to which people browse information on social media ($\alpha = .76$; see supplemental online materials for more detail). Most of the social media activities fell into the active and passive latent variables as expected, with the exception of “Click Like,” which was more closely aligned with passive use rather than active use. All of the latent variables showed high internal reliability (all $\alpha > .69$, see Table 2), and most of the social media indicators were weakly to moderately correlated with one another (all $r_s > .07$, see Table 2), with the exception of the correlations between active use and both Facebook ($r = .02$, $p = .50$, 95%CI = $[-.05, .09]$) and Snapchat ($r = .05$, $p = .19$, 95% CI = $[-.02, .11]$).

Positivity of impressions. Participants were asked to rate the extent to which they liked their interaction partners using six items including “I like this person” and “This person is engaging” using a 1 (*disagree strongly*) to 7 (*agree strongly*) scale (see Table 3). All of the items were significantly correlated with one another (all $r_s > .60$). After running an

exploratory factor analysis, all of the items were combined to form a single “liking” factor (see supplemental materials for details).

Extraversion. Extraversion was measured using the Big Five Inventory (John & Srivastava, 1999). Participants rated the extent to which they agreed or disagreed with items such as “I see myself as someone who is outgoing” using a 1 (*strongly disagree*) to 7 (*strongly agree*) scale ($M = 4.41$, $SD = 1.05$). Extraversion was significantly positively correlated with all of the social media indicators, narcissistic admiration, and both liking others and being liked by others (all $r_s > .09$), and it was marginally positively correlated with narcissistic rivalry ($r = .06$, $p = .09$, 95% CI = $[-.01, .13]$; see Table 2).

Narcissism. Narcissistic admiration and rivalry were measured using the six-item short form of the Narcissistic Admiration and Rivalry Questionnaire (NARQ; Leckelt et al., 2018). Three items were used to assess admiration, including “I deserve to be seen as a great person” ($M = 4.19$, $SD = 1.16$) and three items were used to assess rivalry, including “I want my rivals to fail” ($M = 2.84$, $SD = 1.09$) using a 1 (*strongly disagree*) to 7 (*strongly agree*) scale.³ Admiration was significantly positively correlated with all of the social media use indicators (all $r_s > .08$, all $p_s < .03$), although it was not significantly correlated with liking others ($r = .02$, $p = .61$, 95% CI = $[-.05, .19]$) or being liked by others ($r = .05$, $p = .20$, 95% CI = $[-.02, .11]$). Rivalry was significantly positively correlated with the social network size and both active and passive social media use (all $r_s > .08$, all $p_s < .03$), although it was significantly negatively associated with both liking others and being liked by others (all $r_s < -.13$, all $p_s < .001$). Rivalry was not significantly correlated with the frequency of Facebook, Instagram, or Snapchat use (all $|r_s| < .06$, all $p_s > .09$).

Data analytic approach. To address non-independence reflected in the data, we ran a univariate analysis of liking in multiple round-robin groups ($N_{\text{group}} = 128$) using the Social Relations Model (Kenny & La Voie, 1984) and the TripleR package (Schönbrodt et al., 2012) to estimate perceiver, target, and relationship effects. Perceiver effects indicate the general tendency of the perceiver to like others, whereas target effects indicate the general tendency of the target to be liked by others. Relationship effects refer to the level of liking between the specific perceiver and target, independent of the perceiver and target effects. Given that our primary predictors of interest (social media use) are at the individual level, we focus specifically on perceiver and target effects here.

Given the nature of the study design, we ran several multilevel models with participants nested within round-robin group. To obtain approximate effect size estimates and confidence intervals, we computed the partial correlations

Table 2. Correlations between Social Media Use Indicators and Personality Covariates.

Social Media Indicator	R										
	Facebook	Instagram	Snapchat	Social Network Size	Active use	Passive use	Extraversion	Admiration	Rivalry	Liking others	Being liked
Facebook											
Instagram	.16***										
Snapchat	.20***	.48***									
Social Network Size	.46***	.29***	.31***								
Active Use	.02	.19***	.05	.07†							
Passive Use	.35***	.47***	.40***	.27***	.29***						
Extraversion	.09**	.21***	.18***	.31***	.10**	.15***					
Admiration	.08*	.17***	.08*	.19***	.21***	.21***	.33***				
Rivalry	.06†	.04	-.02	.08*	.14***	.12***	.06†	.35***			
Liking Others	-.03	.11**	.10**	.09*	.01	.07*	.11**	.02	-.21***		
Being Liked	.05	.20***	.16***	.20***	-.06	.08*	.29***	.05	-.13***	.31***	

Note. *r* = Pearson's Correlation Coefficient.

†*p* < .10.

p* < .05. *p* < .01. ****p* < .001.

Table 3. Descriptive Statistics for Liking items.

Liking Indicator	M (SD)	Range
I like this person	5.66 (0.88)	1–7
This person is engaging	5.51 (1.02)	1–7
I could be friends with this person	5.15 (1.19)	1–7
I got along with this person	5.82 (0.88)	2–7
The conversation flowed	5.42 (1.18)	1–7
I enjoyed talking with this person	5.69 (0.95)	1–7

between each social media use indicator and both liking others and being liked by others, controlling for group membership and personality. Because our primary analyses focus on the relationships between individual-level (rather than dyadic- or group-level) variables, the number of participants in our sample is of primary importance in determining power (Snijders, 2005). With our sample size of 806 individuals, we had greater than .99 power to detect the mean effect size in published personality and social psychology studies (i.e., $r = .21$; see Richard et al., 2003).

Results

Target (20.10%), perceiver (21.80%), and relationship (58.20%) variance contributed to ratings of liking, indicating that ratings of liking were due to perceiver effects, wherein perceivers tended to like others across a range of targets, target effects, wherein targets tended to be liked by others across a range of perceivers, and relationship effects, wherein there was a unique relationship between specific dyads.

To examine whether social media use predicts perceiver and target effects, we ran a series of partial correlations controlling for both group membership and personality traits.

Liking of others

Types of social media use. Instagram ($b = .05$, $z = 3.57$, $p = .0004$, $r = .18$, 95% CI = [.08, .21]) and Snapchat ($b = .04$, $z = 3.20$, $p = .001$, $r = .16$, 95% CI = [.06, .20]) use were significantly associated with liking others more, whereas Facebook use was not significantly associated with liking others ($b = -.03$, $z = -1.15$, $p = .25$, $r = -.03$, 95% CI = [-.10, .04]; see Table 4). In other words, those who used Instagram and Snapchat more frequently tended to like others more during first-impressions, whereas Facebook use was not significantly associated with how much people liked others.

In addition, both passive use ($b = .07$, $z = 2.89$, $p = .004$, $r = .13$, 95% CI = [.04, .17]) and having a larger online social network size ($b = .07$, $z = 2.96$, $p = .003$, $r = .14$, 95% CI = [.04, .18]) were significantly associated with liking others more. However, active use was not significantly associated with how much people liked others ($b = .02$, $z = 0.73$, $p = .47$, $r = .04$, 95% CI = [-.04, .10]).

Table 4. Associations Between Social Media Use and Perceiver Liking.

Social Media Indicator	Liking		
	b (SE)	z	r [95% CI]
Facebook	-.03 (.026)	-1.15	-.03 [-.10, .04]
Instagram	.05*** (.015)	3.57	.18 [.08, .21]
Snapchat	.04** (.013)	3.20	.16 [.06, .20]
Social Network Size	.07** (.023)	2.96	.14 [.04, .18]
Active	.02 (.031)	0.73	.04 [-.04, .10]
Passive	.07** (.025)	2.89	.13 [.04, .17]

Note. b = unstandardized regression coefficient; r = Pearson's correlation; CI = Confidence Intervals. 95% confidence intervals for r s are provided. Bolded values indicate associations that held controlling for personality covariates.

** $p < .01$. *** $p < .001$.

The role of personality. Does personality account for any of these relationships? To answer this, we examined whether the associations between social media use and liking of others changed as a function of self-reported extraversion and narcissism. To see the full results as well as additional analyses examining the other Big Five personality traits, see the SOM.

Extraversion. Most of the significant associations between social media use and liking of others held after controlling for self-reported extraversion (all $|r|s > .05$, all $ps < .02$). However, after controlling for self-reported extraversion, the significant association between social network size and liking others became marginal ($b = .04$, $z = 1.75$, $p = .08$, $r = .08$, 95% CI = [-.00, .13]). In other words, extraversion seemed to play a role in the association between social network size and liking others.

Narcissism

Admiration. All of the significant associations between social media use and liking of others held after controlling for self-reported admiration (all $|r|s > .13$, all $ps < .006$), meaning that admiration did not play a significant role in the relationship between different types of social media use and how much people like others in a first-impression context.

Rivalry. All of the significant associations between social media use and liking of others held after controlling for rivalry (all $|r|s > .16$, all $ps < .001$), meaning that rivalry did not play a significant role in the relationships between different types of social media use and liking of others. Interestingly, the non-significant association between active social media use and liking of others became marginally positive after controlling for rivalry ($b = .05$, $z = 1.74$, $p = .08$, $r = .08$, 95% CI = [-.00, .14]). This represents a classic suppression effect (MacKinnon

et al., 2000) and should be interpreted with caution as the replicability of suppression effects have been called into question (Gutierrez & Cribbie, 2019).

Summary

Greater social media use appears to be associated with liking others more, as most of the types of social media use (i.e., Instagram and Snapchat use, passive use, social network size) were positively associated with liking others. Facebook and active use, however, were not significantly associated with liking others. Moreover, most of the significant associations between social media use and liking others were not driven by extraversion or narcissism, suggesting that social media use is linked to how much people like new acquaintances above and beyond one's general tendency to be sociable or charming. Next, we examined whether social media use relates to being liked by others.

Being liked by others

Social media use. Similar to the perceiver effects, using Instagram ($b = .09, z = 5.41, p < .0001, r = .28, 95\% \text{ CI} = [.16, .29]$) and Snapchat ($b = .06, z = 4.62, p < .0001, r = .23, 95\% \text{ CI} = [.11, .25]$) were significantly associated with being liked more by new acquaintances, whereas using Facebook was not significantly associated with being liked ($b = .02, z = 0.61, p = .54, r = .06, 95\% \text{ CI} = [-.02, .12]$; see Table 5). In other words, Instagram and Snapchat were associated with being liked more by others, whereas Facebook was not significantly associated with being liked by others.

Similarly, passive social media use ($b = .07, z = 2.80, p = .005, r = .14, 95\% \text{ CI} = [.04, .18]$) and having a larger online social network ($b = .14, z = 5.45, p < .0001, r = .26, 95\% \text{ CI} = [.14, .27]$) were significantly positively associated with being liked. Active social media use was not significantly associated with being liked ($b = -.03, z = -0.89, p = .38, r = -.03, 95\% \text{ CI} = [-.09, .05]$).

The Role of Personality

Extraversion. Most of the significant associations between social media use and being liked held after controlling for self-reported extraversion (all $|rs| > .16$, all $ps < .0007$; see SOM for full results). However, after controlling for extraversion, the significant positive association between passive use and being liked became marginally positive ($b = .04, z = 1.66, p = .10, r = .08, 95\% \text{ CI} = [-.00, .14]$), suggesting that extraversion accounted for the association between passive use and being liked by others. Of note, the non-significant association between active use and being liked by others became marginally negative after controlling for extraversion ($b = -.06, z = -1.88, p = .06, r = -.07, 95\% \text{ CI} = [-.13, .01]$). Again, this suppression effect should be interpreted with caution.

Table 5. Associations Between Social Media Use and Target Liking.

Social Media Indicator	Liking		
	<i>b</i> (SE)	<i>z</i>	<i>r</i> [95% CI]
Facebook	.02 (.026)	0.61	.06 [-.02, .12]
Instagram	.09*** (.016)	5.41	.28 [.16, .29]
Snapchat	.06*** (.013)	4.62	.23 [.11, .25]
Social Network Size	.14*** (.026)	5.45	.26 [.14, .27]
Active	-.03 (.036)	-0.89	-.03 [-.09, .05]
Passive	.07*** (.026)	2.80	.14 [.04, .18]

Note. *b* = unstandardized regression coefficient; *r* = Pearson's correlation; CI = Confidence Intervals. 95% confidence intervals for *rs* are provided. Values in boldface indicate associations that held controlling for personality covariates.

*** $p < .001$.

Narcissism

Admiration. All of the significant associations between social media use and being liked held after controlling for self-reported admiration (all $|rs| > .13$, all $ps < .01$), suggesting that admiration did not play a significant role in the relationships between social media use and target liking.

Rivalry. Similarly, all of the significant associations between social media use and target liking held after controlling for self-reported rivalry (all $|rs| > .17$, all $ps < .0009$), again suggesting that rivalry did not play a major role in these relationships.

Summary

Overall, social media use appears to be associated with being liked more by others in a new-acquaintance context. Specifically, Instagram and Snapchat, passive use, and having a larger social network size were associated with being liked more. These associations tended to be larger in size than those seen with liking others. In contrast, Facebook and active use were not significantly associated with being liked by others. The majority of these associations could not be explained by extraversion or narcissism, with the exception of passive use whereby extraversion appears to contribute to the relationship between passive use and being liked.

Discussion

We found that how people use social media does, indeed, relate to liking and being liked by others in in-person interactions, extending previous research by examining how social media use relates to social experiences both from the perspective of the self and from people's interaction partners using in-the-moment assessments of social experiences. The associations between social media use and being liked appeared to be stronger than the associations with liking others (see SOM for analyses with both perceiver and target

liking simultaneously), despite the fact that liking others and social media use ratings came from the same perspective (the self). Thus, greater social media use may have stronger implications for how much a person is liked than how much a person tends to like others. Some social media indicators also showed more consistent associations than others. Specifically, Instagram and Snapchat were consistently associated with liking others and being liked by others, above and beyond relevant personality traits, thus supporting the idea that social media use is associated with positive social experiences. Thus, using social media, particularly sites like Instagram and Snapchat, may indicate or foster greater social skills and engagement, which may in turn benefit in person social interactions, resulting in greater liking in getting-acquainted interactions. Similarly, passive use was associated with liking others and being liked by others, although these associations were largely accounted for by extraversion. Finally, neither Facebook nor active use were significantly associated with liking others or being liked by others.

Why might different social media sites relate to differences in social interactions, such that Instagram and Snapchat were associated with more positive interactions, but Facebook was not? People tend to use social media sites in different ways (Alhabash & Ma, 2017). Thus, motivations behind the use of these sites may relate to differences in social interactions. For example, people tend to use Instagram and Snapchat for self-expression, which has been related to positive social experiences (Chervonsky & Hunt, 2017). In contrast, Facebook is used more habitually (Vishwanath, 2015; Giannakos et al., 2013), perhaps indicating an automaticity and impulsivity to using Facebook that is not motivated by the desire for social connection. It could be that people who use certain social media sites like Instagram and Snapchat might generally engage in more positive forms of self-expression, thus relating to more positive interactions, whereas those who use other sites, such as Facebook, might use it more out of habit without the goal of connecting to others. Future research should examine this possibility.

Unlike much previous research, passive use was associated with more positive social experiences, as indicated by greater liking of others and being liked more by others, although these associations were largely accounted for by extraversion. In other words, those who use social media more passively may have more positive in-person interactions due to having a more sociable personality. Why would passive use be linked to greater extraversion, given that past research has found it to be associated with lower social well-being and greater loneliness (Burke et al., 2010; Kraut et al., 1998)? One possibility is that our passive use indicator included “clicking like” in addition to browsing profiles and checking one’s homepage, for example. This may suggest that passive use, at least as indexed in the present study, may not be entirely passive, but may instead serve an interpersonal connection function, which tends to be beneficial (Clark et al., 2018). Indeed, clicking like may fulfill

socialization needs, as it acts as a gesture of showing support for others (Hayes et al., 2016; Lowe-Calverley & Grieve, 2018). Therefore, passive use, specifically “clicking like,” may provide an easy way for people to engage with people online. Furthermore, in line with previous studies (Burke et al., 2010; Verduyn et al., 2015) passive use was more common than active use, suggesting that passive use may indicate a more normative, and potentially healthy use of social media which, in turn, is associated with more positive social experiences.

Related to this idea, active use was not significantly associated with liking others or with being liked by others, perhaps because of the low frequency by which people use social media actively (Burke et al., 2010; Verduyn et al., 2015). Perhaps having greater variability between participants in their tendencies to use social media actively would increase the power to detect small associations between active use and in-person interactions. Furthermore, our active use indicator was comprised of two items, posting photos and status updates, which may be more closely associated with self-promotion than interpersonal connection. As previous research suggests that active use that fosters social connection is associated with more positive outcomes (Burke et al., 2010; Clark et al., 2018; Ellison et al., 2007; Grieve et al., 2013; C. Y. Liu & Yu, 2013), it could be that active use for the purpose of self-promotion is not significantly associated with social experiences, at least in-person.

Finally, social network size was significantly associated with liking others and with being liked by others. The association with being liked appeared above and beyond the effects of extraversion and narcissism, which is in line with previous research suggesting that those who have more friends on Facebook are seen more positively by others (Tong et al., 2008). However, the association with liking others was largely explained by extraversion, suggesting that people may have larger online social networks and like others more because they are more sociable. This is in line with previous research suggesting that social network size is significantly associated with extraversion (D. Liu & Campbell, 2017; Pollet et al., 2011). Perhaps motivation behind having a larger online social network may account for the relationships between social network size and interpersonal liking. For example, after controlling for extraversion, the association between social network size and liking of others became non-significant, suggesting that those who have a larger online social network to connect with a more people (Schaefer, 2008) may have more positive in-person experiences.

Of note, most of the effect sizes in the present study were fairly small ($.01 < r < .25$). However, the findings may still be important. As noted by Funder and Ozer (2019), small effects may not seem important in-the-moment but may be consequential over the long term. Thus, social media use may have a small effect on how much people like others and are liked by others in a single instance, as shown in the

present study, but may have stronger effects over time, as people interact with more people.

Limitations and Future Directions

Given the cross-sectional nature of this study, we were unable to disentangle the direction of the associations between social media use and positive social interactions. Is it that social media use enhances a person's social skills, which in turn benefits in-person interactions? Or do people who have stronger in-person social skills and more positive interactions use social media more and in more adaptive ways? Given that these links appear to emerge quite independently of relevant personality traits, future research should attempt to further understand causality with longitudinal and experimental designs. If some forms of social media use actually do benefit how much people like and are liked by others in person, this could be quite an easy, if surprising, method by which to enhance offline social interactions. Future research should also examine other potential mechanisms and individual differences, beyond personality and physical attractiveness (see Footnote 3), that could play a role in the links between social media use and liking in getting-acquainted interactions.

Although a strength of this study was that it examined various social media sites and different types of use within the same study, we were unable to examine how people use different social media sites in different ways. That is, we did not examine using active and passive use on each site, or different motivations for use of different sites. Alhabash and Ma (2017) found that people use and are motivated to use social media sites in different ways (e.g., for self-expression vs. passing time), and personality can influence people's motivations (Seidman, 2013) and preferences (Hughes et al., 2012) for social media use. For example, some people may use Instagram to share interests with those in their social network, whereas others might use it to promote product (e.g., Instagram Influencers). Similarly, people may differ in their use of specific aspects of social media sites, such as preference for Instagram stories over posts. It would be interesting to examine whether different types of use both within and between platforms (e.g., active Instagram use, passive Facebook use) and different reasons for using these platforms relate to differences in in-person interactions and personality, as the motivations underlying social media use may be more important than the platform or type of use that people engage in.

The current study used subjective self-reports to examine social media use and social network size. However, people tend to poorly estimate their technology use (Duncan et al., 2012), and the use of arbitrary cutoffs to measure social network size may remove important variance in the data. As such, future research should use open-ended response options and objective measures (e.g., phone tracking) to get a purer understanding of how social media relates to in-person interactions.

This sample was comprised of predominantly female university-aged students at a large North American university. Although men and women tend to use social media in similar ways (Auxier & Anderson, 2021), future research should collect a more balanced sample to improve the generalizability of these results. Furthermore, social media use is rising among those of different age groups and demographics (Perrin & Anderson, 2019). It is therefore necessary to examine these associations across a more diverse group of participants to examine the generalizability and possible moderators of these relationships. Social media use differs between those of various age groups, such that young adults tend to use Instagram, Snapchat, and TikTok more frequently than older adults, although Facebook use tends to be similar across age groups (Auxier & Anderson, 2021). Moreover, given growing concerns about the impact of social media on younger teenagers' social interactions (Orlowski, 2020; The Learning Network, 2020) it is especially important to examine these associations for this age group.

Furthermore, social media trends are constantly changing. YouTube and Reddit use has increased since 2019, whereas use of other platforms have remained relatively stable (Auxier & Anderson, 2021). In addition, social circumstances, like the COVID-19 pandemic, may influence motivations to use social media and alter what constitutes normative, positive, or negative use. For example, people may rely more on social media for communication when they are unable to interact with others in-person during a situation like a pandemic. Therefore, spending a large amount of time on social media may be considered normative and positive in such circumstances, whereas it would have otherwise been considered abnormal and problematic. As such, what is considered positive or negative social media use is likely to evolve and could be considered relative, subjective, and situationally dependent. Consequently, it may be difficult to formulate a concrete, formal definition of what constitutes positive and negative social media use. Future research should adapt its understanding of normative, positive use alongside the inevitable changes in norms and implications of social media use.

Conclusion

Overall, despite widespread concerns about how social media impacts in-person social interactions, we found that multiple forms of social media, including Instagram, Snapchat, and passive use, were associated with more positive initial face-to-face interactions, as indicated by liking others and being liked by others more. However, other types of use, including Facebook and active use, were not significantly associated with liking in in-person interactions. Importantly, most of the associations emerged above and beyond the effects of trait-level extraversion and narcissistic admiration and rivalry. Thus, social media may have links to offline social interactions that are independent of these more

general individual differences. As social media use continues to flourish, it is important to examine how this medium of communication relates to offline experiences, and particularly whether it may carry benefits, as the current results may suggest, including broadly, within specific social interactions, and from multiple perspectives. This study was a first step in determining which forms of social media use may be beneficial and which forms may be less relevant to initial in-person social interactions.

Acknowledgments

The authors thank Dr. Jeremy Biesanz for helpful feedback on this manuscript and the members of the Social Interaction and Perception Lab at McGill University for their help in data collection and cleaning.

Author contributions

L. J. Human and J. L. Heyman designed the studies and conceptualized the research question, and all three authors collected the data. J. L. Heyman analyzed the data and wrote the manuscript and L. J. Human and L. G. Kerr provided critical edits and feedback on the manuscript.


Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was partially supported by Social Sciences and Humanities Research Council (SSHRC) of Canada Grant 435-2016-0499 to Lauren J. Human. Preparation of this manuscript was supported in part by funding from the Canada Research Chairs program to Lauren J. Human and the Tomlinson Doctoral Fellowship to Jennifer L. Heyman.

ORCID iD

Jennifer L. Heyman  <https://orcid.org/0000-0002-1158-7527>

Supplemental Material

Supplemental material is available online with this article.

Notes

1. We also examined the four other Big Five traits and found that none played a significant role in the relationships between social media use and liking or being liked (see Supplementary Materials pg. 6–10).
2. Use of Twitter and dating sites (e.g., Tinder) were also reported but were used very infrequently (Twitter: $M = 2.09$, $SD = 2.05$; Dating sites: $M = 1.62$, $SD = 1.40$) and were not significantly associated with liking (all $|rs| < .04$, all $ps > .23$).
3. As an additional non-self-reported covariate, we also examined the role of objective attractiveness ratings of the participants.

Three to four trained research assistants viewed photos of the participants and rated the extent to which they agreed or disagreed with the statement “I find this person attractive” using a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. The intra-class correlation coefficient (ICC) was calculated to assess interrater reliability between the raters. Using the two-way mixed effects model and “average rater” unit, we found that there was high agreement between the raters ($ICC = .79$, $p < .001$). Controlling for objective attractiveness did not significantly alter the results, suggesting that social media use does not appear to be linked to liking and being liked due to a person’s physical attractiveness.

References

- Akert, R. M., & Panter, A. T. (1988). Extraversion and the ability to decode nonverbal communication. *Personality and Individual Differences, 9*, 965–972. [https://doi.org/10.1016/0191-8869\(88\)90130-4](https://doi.org/10.1016/0191-8869(88)90130-4)
- Alhabash, S., & Ma, M. (2017). A tale of four platforms: Motivations and uses of Facebook, Twitter, Instagram, and Snapchat among college students? *Social Media + Society, 3*(1), 1–13. <https://doi.org/10.1177/2056305117691544>
- Allen, S. (2019). *Social media’s growing impact on our lives*. American Psychological Association. <https://www.apa.org/members/content/social-media-research>
- Amichai-Hamburger, Y., & Vinitzky, G. (2010). Social network use and personality. *Computers in Human Behavior, 26*, 1289–1295. <https://doi.org/10.1016/j.chb.2010.03.018>
- Amiel, T., & Sargent, S. L. (2004). Individual differences in Internet usage motives. *Computers in Human Behavior, 20*, 711–726. <https://doi.org/10.1016/j.chb.2004.09.002>
- Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behaviors, 64*, 287–293. <https://doi.org/10.1016/j.addbeh.2016.03.006>
- Auxier, B., & Anderson, M. (2021). *Social media use in 2021*. Pew Research Center. https://www.pewresearch.org/internet/wp-content/uploads/sites/9/2021/04/PI_2021.04.07_Social-Media-Use_FINAL.pdf
- Back, M. D., Küfner, A. C., Dufner, M., Gerlach, T. M., Rauthmann, J. F., & Denissen, J. J. (2013). Narcissistic admiration and rivalry: Disentangling the bright and dark sides of narcissism. *Journal of Personality and Social Psychology, 105*, 1013–1037. <https://doi.org/10.1037/a0034431>
- Bosson, J. K., Lakey, C. E., Campbell, W. K., Zeigler-Hill, V., Jordan, C. H., & Kernis, M. H. (2008). Untangling the links between narcissism and self-esteem: A theoretical and empirical review. *Social and Personality Psychology Compass, 2*, 1415–1439. <https://doi.org/10.1111/j.1751-9004.2008.00089.x>
- Burke, M., Kraut, R., & Marlow, C. (2011). Social capital on Facebook: Differentiating uses and users. In T. Desney, G. Fitzpatrick, C. Gutwin, B. Begole, & W. Kellogg (Eds.), *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 571–580). <https://doi.org/10.1145/1978942.1979023>
- Burke, M., Marlow, C., & Lento, T. (2010). Social network activity and social well-being. In E. Mynatt, G. Fitzpatrick, S. Hudson, K. Edwards, & T. Rodden (Eds.), *Proceedings of the*

- SIGCHI conference on human factors in computing systems* (pp. 1909–1912). <https://doi.org/10.1145/1753326.1753613>
- Caplan, S. E. (2006). Relations among loneliness, social anxiety, and problematic internet use. *CyberPsychology & Behavior, 10*, 234–242. <https://doi.org/10.1089/cpb.2006.9963>
- Chak, K., & Leung, L. (2004). Shyness and locus of control as predictors of internet addiction and internet use. *CyberPsychology & Behavior, 7*, 559–570. <https://doi.org/10.1089.cpb.2004.7.559>
- Chen, B., & Marcus, J. (2012). Students' self-presentation on Facebook: An examination of personality and self-construal factors. *Computers in Human Behavior, 28*, 2091–2099. <https://doi.org/10.1016/j.chb.2012.06.013>
- Chervonsky, E., & Hunt, C. (2017). Suppression and expression of emotion in social and interpersonal outcomes: A meta-analysis. *Emotion, 17*, 669–683. <https://doi.org/10.1037/emo0000270>
- Clark, J. L., Algoe, S. B., & Green, M. C. (2018). Social network sites and well-being: The role of social connection. *Current Directions in Psychological Science, 27*(1), 32–37. <https://doi.org/10.1177/0963721417730833>
- Coplan, R. J., & Armer, M. (2007). A “multitude” of solitude: A closer look at social withdrawal and nonsocial play in early childhood. *Child Development Perspectives, 1*(1), 26–32. <https://doi.org/10.1111/j.1750-8606.2007.00006.x>
- Drago, E. (2015). The effect of technology on face-to-face communication. *Elon Journal of Undergraduate Research in Communications, 6*(1), 1–2. <http://www.inquiriesjournal.com/a?id=1137>
- Duncan, D., Hoekstra, A., & Wilcox, B. (2012). Digital devices, distraction, and student performance: Does in-class cell phone use reduce learning? *Astronomy Education Review, 11*, 010108-1–010108-4. <https://doi.org/10.3847/AER2012011>
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook “friends”: Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication, 12*, 1143–1168. <https://doi.org/10.1111/j.1083-6101.2007.00367.x>
- Elshaug, C., & Metzger, J. (2001). Personality attributes of volunteers and paid workers engaged in similar occupational tasks. *The Journal of Social Psychology, 141*, 752–763. <https://doi.org/10.1080/00224540109600586>
- Funder, D. C., & Ozer, D. J. (2019). Evaluating effect size in psychological research: Sense and nonsense. *Advances in Methods and Practices in Psychological Science, 2*, 156–168. <https://doi.org/10.1177/2515245919847202>
- Geladi, N. (2018). *Technology is affecting the quality of human face-to-face interaction*. Digital Society. <https://medium.com/digital-society/technology-is-affecting-the-quality-of-human-face-to-face-interaction-146fe72a29c5>
- Gerson, J., Plagnol, A. C., & Corr, P. J. (2017). Passive and active Facebook use measure (PAUM): Validation and relationship to the reinforcement sensitivity theory. *Personality and Individual Differences, 117*, 81–90. <https://doi.org/10.1016/j.paid.2017.05.034>
- Giannakos, M. N., Chorianopoulos, K., Giotopoulos, K., & Vlamos, P. (2013). Using Facebook out of habit. *Behaviour & Information Technology, 32*, 594–602. <https://doi.org/10.1080/0144929X.2012.659218>
- Gosling, S. D., Augustine, A. A., Vazire, S., Holtzman, N., & Gaddis, S. (2011). Manifestations of personality in online social networks: Self-reported Facebook-related behaviors and observable profile information. *CyberPsychology, Behavior, and Social Networking, 14*, 483–488. <https://doi.org/10.1089/cyber.2010.0087>
- Gosling, S. D., Gaddis, S., & Vazire, S. (2007). Personality impressions based on Facebook profiles. *ICWSM, 7*, 1–4. <https://icwsm.org/papers/3-Gosling-Gaddis-Vazire.pdf>
- Grieve, R., Indian, M., Witteveen, K., Tolan, G. A., & Marrington, J. (2013). Face-to-face or Facebook: Can social connectedness be derived online? *Computers in Human Behavior, 29*, 604–609. <https://doi.org/10.1016/j.chb.2012.011.017>
- Gutierrez, N. M., & Cribbie, R. (2019). *Incidence and interpretation of statistical suppression in psychological research*. <https://doi.org/10.31234/osf.io/rke62>
- Hamburger, Y. A., & Ben-Artzi, E. (2000). The relationship between extraversion and neuroticism and the different uses of the internet. *Computers in Human Behavior, 16*, 441–449. [https://doi.org/10.1016/S0747-5632\(00\)00017-0](https://doi.org/10.1016/S0747-5632(00)00017-0)
- Hayes, R. A., Carr, C. T., & Wohn, D. Y. (2016). One click, many meanings: Interpreting paralinguistic digital affordances in social media. *Journal of Broadcasting & Electronic Media, 60*(1), 171–187. <https://doi.org/10.1080/08838151.2015.1127248>
- Heiberger, G., & Harper, R. (2008). Have you Facebooked Astin lately? Using technology to increase student involvement. *New Directions for Student Services, 2008*, 19–35. <https://doi.org/10.1002/ss.293>
- Hendrick, C., & Brown, S. R. (1971). Introversion, extraversion, and interpersonal attraction. *Journal of Personality and Social Psychology, 20*(1), 31–36. <https://doi.org/10.1037/h0031699>
- Hong, F. Y., Huang, D. H., Lin, H. Y., & Chiu, S. L. (2014). Analysis of the psychological traits, Facebook usage, and Facebook addiction model of Taiwanese university students. *Telematics and Informatics, 31*, 597–606. <https://doi.org/10.1016/j.tele.2014.01.001>
- Huang, H., & Leung, L. (2009). Instant messaging addiction among teenagers in China: Shyness, alienation, and academic performance decrement. *CyberPsychology & Behavior, 12*, 675–679. <https://doi.org/10.1089/cpb.2009.0060>
- Hughes, D. J., Rowe, M., Batey, M., & Lee, A. (2012). A tale of two sites: Twitter vs. Facebook and the personality predictors of social media usage. *Computers in Human Behavior, 28*, 561–569. <https://doi.org/10.1016/j.chb.2011.11.001>
- Iacovelli, A., & Valenti, S. (2009). Internet addiction's effect on likeability and rapport. *Computers in Human Behavior, 25*, 439–443. <https://doi.org/10.1016/j.chb.2008.10.006>
- John, O. P., & Srivastava, S. (1999). The big five trait taxonomy: History, measurement, and theoretical perspectives. In L. A. Pervin & O. P. John (Eds.), *Handbook of personality: Theory and research* (vol. 2, pp. 102–138). New York, NY: Guilford Press.
- Kavanaugh, A., Carroll, J. M., Rosson, M. B., Zin, T. T., & Reese, D. D. (2005). Community networks: Where offline communities meet online. *Journal of Computer-Mediated Communication, 10*, Article JCMC10417. <https://doi.org/10.1111/j.1083-6101.2005.tb00266.x>
- Kenny, D. A., & La Voie, L. (1984). The social relations model. In L. Berkowitz (Ed.), *Advances in experimental social*

- psychology (vol. 18, pp. 141–182). Academic Press. [https://doi.org/10.1016/S0065-2601\(08\)60144-6](https://doi.org/10.1016/S0065-2601(08)60144-6)
- Kim, J., LaRose, R., & Peng, W. (2009). Loneliness as the cause and the effect of problematic Internet use: The relationship between Internet use and psychological well-being. *CyberPsychology & Behavior, 12*, 451–455. <https://doi.org/10.1089/cpb.2008.0327>
- Kim, Y., Wang, Y., & Oh, J. (2016). Digital media use and social engagement: How social media and smartphone use influence social activities of college students. *CyberPsychology, Behavior, and Social Networking, 19*, 264–269. <https://doi.org/10.1089/cyber.2015.0408>
- Kircaburun, K., & Griffiths, M. D. (2018). Instagram addiction and the big five of personality: The mediating role of self-liking. *Journal of Behavioral Addictions, 7*(1), 158–170. <https://doi.org/10.1556/2006.7.2018.15>
- Koutamanis, M., Vossen, H. G., Peter, J., & Valkenburg, P. M. (2013). Practice makes perfect: The longitudinal effect of adolescents' instant messaging on their ability to initiate offline friendships. *Computers in Human Behavior, 29*, 2265–2272. <https://doi.org/10.1016/j.chb.2013.04.033>
- Krasnova, H., Wenninger, H., Widjaja, T., & Buxmann, P. (2013, February 27–March 1). *Envy on Facebook: A hidden threat to users' life satisfaction?* [Paper presentation]. *Proceedings of the 11th International Conference on Wirtschaftsinformatik (WI2013), Universität Leipzig, Germany*. <https://doi.org/10.7892/boris.47080>
- Kraut, R., Kiesler, S., Boneva, B., Cummings, J., Helgeson, V., & Crawford, A. (2002). Internet paradox revisited. *Journal of Social Issues, 58*(1), 49–74. <https://doi.org/10.1111/1540-4560.00248>
- Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukhopadhyay, T., & Scherlis, W. (1998). Internet paradox: A social technology that reduces social involvement and psychological well-being? *American Psychologist, 53*, 1017–1031. <https://doi.org/10.1037/0003-066X.53.9.1017>
- Küfner, A. C., Nestler, S., & Back, M. D. (2013). The two pathways to being an (un-) popular narcissist. *Journal of Personality, 81*, 184–195. <https://doi.org/10.1111/j.1467-6494.2012.00795.x>
- Kuo, T., & Tang, H. L. (2014). Relationships among personality traits, Facebook usages, and leisure activities—A case of Taiwanese college students. *Computers in Human Behavior, 31*, 13–19. <https://doi.org/10.1016/j.chb.2013.10.019>
- The Learning Network. (2020, February 6). What students are saying about how much they use their phones and whether we should be worried. *The New York Times*. <https://www.nytimes.com/2020/02/06/learning/what-students-are-saying-about-how-much-they-use-their-phones-and-whether-we-should-be-worried.html>
- Leckelt, M., Küfner, A. C., Nestler, S., & Back, M. D. (2015). Behavioral processes underlying the decline of narcissists' popularity over time. *Journal of Personality and Social Psychology, 109*, 856–871. <https://doi.org/10.1037/pspp0000057>
- Leckelt, M., Wetzel, E., Gerlach, T. M., Ackerman, R. A., Miller, J. D., Chopik, W. J., Penke, L., Geukes, K., Küfner, A. C. P., Hutteman, R., Richter, D., Renner, K.-H., Allroggen, M., Brecheen, C., Campbell, W. K., Grossmann, I., & Back, M. D. (2018). Validation of the Narcissistic Admiration and Rivalry Questionnaire Short Scale (NARQ-S) in convenience and representative samples. *Psychological Assessment, 30*(1), 86–96. <https://doi.org/10.1037/pas0000433>
- Liu, C. Y., & Kuo, F. Y. (2007). A study of internet addiction through the lens of the interpersonal theory. *CyberPsychology & Behavior, 10*, 799–804. <https://doi.org/10.1089/cpb.2007.9951>
- Liu, C. Y., & Yu, C. P. (2013). Can Facebook use induce well-being? *CyberPsychology, Behavior, and Social Networking, 16*, 674–678. <https://doi.org/10.1089/cyber.2012.0301>
- Liu, D., & Campbell, W. K. (2017). The big five personality traits, big two metatraits and social media: A meta-analysis. *Journal of Research in Personality, 70*, 229–240. <https://doi.org/10.1016/j.jrp.2017.08.004>
- Longstreet, P., & Brooks, S. (2017). Life satisfaction: A key to managing internet & social media addiction. *Technology in Society, 50*, 73–77. <https://doi.org/10.1016/j.techsoc.2017.05.003>
- Lowe-Calverley, E., & Grieve, R. (2018). Thumbs up: A thematic analysis of image-based posting and liking behaviour on social media. *Telematics and Informatics, 35*, 1900–1913. <https://doi.org/10.1016/j.tele.2018.06.003>
- MacKay, K., Van Winkle, C., & Halpenny, E. (2019). *Active vs passive social media use, attendee engagement, and festival loyalty*. https://scholarworks.umass.edu/ttra/2019/research_papers/3/
- McKinney, B. C., Kelly, L., & Duran, R. L. (2012). Narcissism or openness? College students' use of Facebook and Twitter. *Communication Research Reports, 29*, 108–118. <https://doi.org/10.1080/08824096.2012.666919>
- MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding and suppression effect. *Prevention Science, 1*, 173–181. <https://doi.org/10.1023/A:1026595011371>
- Metzler, A., & Scheithauer, H. (2017). The long-term benefits of positive self-presentation via profile pictures, number of friends and the initiation of relationships on Facebook for adolescents' self-esteem and the initiation of offline relationships. *Frontiers in Psychology, 8* Article 1981. <https://doi.org/10.3389/fpsyg.2017.01981>
- Milani, L., Osualdella, D., & Di Blasio, P. (2009). Quality of interpersonal relationships and problematic Internet use in adolescence. *CyberPsychology & Behavior, 12*, 681–684. <https://doi.org/10.1089/cpb.2009.0071>
- Morf, C. C., & Rhodewalt, F. (2001). Unraveling the paradoxes of narcissism: A dynamic self regulatory processing model. *Psychological Inquiry, 12*, 177–196. https://doi.org/10.1207/S15327965PLI1204_1
- Orlowski, J. (Director). (2020). *The social dilemma* [Film]. Exposure Labs.
- Perrin, A., & Anderson, M. (2019). *Share of U.S. adults using social media, including Facebook, is mostly unchanged since 2018*. Pew Research Center. <https://www.pewresearch.org/fact-tank/2019/04/10/share-of-u-s-adults-using-social-media-including-facebook-is-mostly-unchanged-since-2018/>
- Pollet, T. V., Roberts, S. G., & Dunbar, R. I. (2011). Use of social network sites and instant messaging does not lead to increased offline social network size, or to emotionally closer relationships with offline network members. *CyberPsychology, Behavior, and Social Networking, 14*, 253–258. <https://doi.org/10.1089/cyber.2010.0161>
- Punyanunt-Carter, N. M., De La Cruz, J. J., & Wrench, J. S. (2017). Investigating the relationships among college students' satisfaction, addiction, needs, communication apprehension,

- motives, and uses & gratifications with Snapchat. *Computers in Human Behavior*, 75, 870–875. <https://doi.org/10.1016/j.chb.2017.06.034>
- Richard, F. D., Bond, C. F. Jr., & Stokes-Zoota, J. J. (2003). One hundred years of social psychology quantitatively described. *Review of General Psychology*, 7, 331–363. <https://doi.org/10.1037/1089-2680.7.4.331>
- Rifkin, J., Cindy, C., & Kahn, B. (2015). FOMO: How the fear of missing out leads to missing out. In I. Diehl, C. Yoon, & M. N. Duluth (Eds.), *North American advances in consumer research* (vol. 43, pp. 244–248). Association for Consumer Research. <https://www.acrwebsite.org/volumes/1019794/volumes/v43/NA-43>
- Rosen, L. D., Whaling, K., Carrier, L. M., Cheever, N. A., & Rökkum, J. (2013). The media and technology usage and attitudes scale: An empirical investigation. *Computers in Human Behavior*, 29, 2501–2511. <https://doi.org/10.1016/j.chb.2013.06.006>
- Ross, C., Orr, E. S., Sisic, M., Arseneault, J. M., Simmering, M. G., & Orr, R. R. (2009). Personality and motivations associated with Facebook use. *Computers in Human Behavior*, 25, 578–586. <https://doi.org/10.1016/j.chb.2008.12.024>
- Russo, S., & Amnå, E. (2016). The personality divide: Do personality traits differentially predict online political engagement? *Social Science Computer Review*, 34, 259–277. <https://doi.org/10.1177/0894439315582487>
- Ryan, T., Chester, A., Reece, J., & Xenos, S. (2014). The uses and abuses of Facebook: A review of Facebook addiction. *Journal of Behavioral Addictions*, 3, 133–148. <https://doi.org/10.1556/jba.3.2014.016>
- Ryan, T., & Xenos, S. (2011). Who uses Facebook? An investigation into the relationship between the big five, shyness, narcissism, loneliness, and Facebook usage. *Computers in Human Behavior*, 27, 1658–1664. <https://doi.org/10.1016/j.chb.2011.02.004>
- Satici, S. A. (2019). Facebook addiction and subjective well-being: A study of the mediating role of shyness and loneliness. *International Journal of Mental Health and Addiction*, 17(1), 41–55. <https://doi.org/10.1007/s11469-017-9862-8>
- Savci, M., Turan, M. E., Griffiths, M. D., & Ercengiz, M. (2019). Histrionic personality, personality, and problematic social media use: Testing of a new hypothetical model. *International Journal of Mental Health and Addiction*, 19, 986–1004. <https://doi.org/10.1007/s11469-019-00139-5>
- Schaefer, C. (2008). *Motivations and usage patterns on social networking sites*. ECIS 2008 Proceedings 143. <http://aisel.aisnet.org/ecis2008/143>
- Schönbrodt, F. D., Back, M. D., & Schmukle, S. C. (2012). TripleR: An R package for social relations analyses based on round-robin designs. *Behavior Research Methods*, 44, 455–470. <https://doi.org/10.3758/s13428-011-0150-4>
- Seidman, G. (2013). Self-presentation and belonging on Facebook: How personality influences social media use and motivations. *Personality and Individual Differences*, 54, 402–407. <https://doi.org/10.1016/j.paid.2012.10.009>
- Seidman, G., Roberts, A., & Zeigler-Hill, V. (2019). Narcissism and romantic relationship presentation on social media: The role of motivations and partner attractiveness. *Personality and Individual Differences*, 149, 21–30. <https://doi.org/10.1016/j.paid.2019.05.039>
- Snijders, T. A. (2005). Power and sample size in multilevel linear models. In B. S. Everitt & D. C. Howell (Eds.), *Encyclopedia of statistics in behavioral science* (vol. 3, pp. 1570–1573). Wiley. <https://doi.org/10.1002/0470013192.bsa492>
- Subrahmanyam, K., Reich, S. M., Waechter, N., & Espinoza, G. (2008). Online and offline social networks: Use of social networking sites by emerging adults. *Journal of Applied Developmental Psychology*, 29, 420–433. <https://doi.org/10.1016/j.appdev.2008.07.003>
- Tong, S. T., Van Der Heide, B., Langwell, L., & Walther, J. B. (2008). Too much of a good thing? The relationship between number of friends and interpersonal impressions on Facebook. *Journal of Computer-Mediated Communication*, 13, 531–549. <https://doi.org/10.1111/j.1083-6101.2008.00409.x>
- Tosun, L. P., & Lajunen, T. (2010). Does Internet use reflect your personality? Relationship between Eysenck's personality dimensions and Internet use. *Computers in Human Behavior*, 26, 162–167. <https://doi.org/10.1016/j.chb.2009.10.010>
- Vander Molen, R. J., Kaplan, S., Choi, E., & Montoya, D. (2018). Judgments of the Dark Triad based on Facebook profiles. *Journal of Research in Personality*, 73, 150–163. <https://doi.org/10.1016/j.jrp.2017.11.010>
- Verduyn, P., Lee, D. S., Park, J., Shablack, H., Orvell, A., Bayer, J., Ybarra, J., Jonides, J., & Kross, E. (2015). Passive Facebook usage undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology: General*, 144, 480–488. <https://doi.org/10.1037/xge0000057>
- Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review*, 11(1), 274–302. <https://doi.org/10.1111/sipr.12033>
- Vishwanath, A. (2015). Habitual Facebook use and its impact on getting deceived on social media. *Journal of Computer-Mediated Communication*, 20(1), 83–98. <https://doi.org/10.1111/jcc4.12100>
- Vogel, E. A., Rose, J. P., Okdie, B. M., Eckles, K., & Franz, B. (2015). Who compares and despairs? The effect of social comparison orientation on social media use and its outcomes. *Personality and Individual Differences*, 86, 249–256. <https://doi.org/10.1016/j.paid.2015.06.026>
- Waytz, A., & Gray, K. (2018). Does online technology make us more or less sociable? A preliminary review and call for research. *Perspectives on Psychological Science*, 13, 473–491. <https://doi.org/10.1177/17845691617746509>
- Whang, L. S. M., Lee, S., & Chang, G. (2003). Internet over-users' psychological profiles: A behavior sampling analysis on internet addiction. *CyberPsychology & Behavior*, 6, 143–150. <https://doi.org/10.1089/109493103321640338>
- Whiting, A., & Williams, D. (2013). Why people use social media: A uses and gratifications approach. *Qualitative Market Research: An International Journal*, 16(4), 362–369. <https://doi.org/10.1108/QMR-06-2013-0041>
- Wooley, S. (2013). Constantly connected: The impact of social media and the advancement in technology on the study abroad experience. *Elon Journal of Undergraduate Research in Communications*, 4, 1–4. <http://www.inquiriesjournal.com/a?id=822>
- Wyatt, K., & Phillips, J. G. (2005). Internet use and misuse in the workplace. In A. Donaldson (Ed.), *Proceedings of the 17th Australia conference on computer-human interaction: Citizens online: Considerations for today and the future* (pp. 1–4). <https://dl.acm.org/doi/abs/10.5555/1108368.1108437>