

An Examination of College Students' Social Media Use, Fear of Missing Out, and Mindful Attention

Jo Lauren Weaver and Jacqueline M. Swank

This study investigated problematic social media use (PSMU), the fear of missing out (FOMO), mindful attention, self-esteem, and life satisfaction among 278 undergraduate students. Results indicated that PSMU and FOMO negatively related to mindful attention, self-esteem, and life satisfaction. The mediation model suggested that mindful attention inversely mediated the relationship between FOMO and PSMU. Thus, FOMO predicted PSMU in users who were less mindfully attentive. We discuss the results, limitations, implications, and recommendations for research.

Keywords: college students, fear of missing out, mindfulness, problematic social media use, life satisfaction

Social media permeates college students' lives, with the majority accessing platforms multiple times daily (Perrin & Anderson, 2019). Social media is no longer an innovation, but a life fixture. Because of this predominance, it behooves college counselors to learn about the mental health repercussions of social media among college students. The advent of social networking sites (e.g., Facebook) began among college students, yet current student users experience emergent effects of these platforms. Terminology such as "FOMO" (fear of missing out) and "phubbing" (phone snubbing) underlie the adverse by-products of social media as they negatively relate to prosocial constructs, such as social connection (e.g., FOMO; Roberts & David, 2019) and conversation intimacy (e.g., phubbing; Vanden Abeele et al., 2019). Yet, social media can also be an avenue for building social capital among college students (Kim & Kim, 2017), in that they can ostensibly connect with others by clicking a button. However, with the accessibility of the internet, innocuous social media use may become impulsive; dysregulated; and, ultimately, problematic, resulting in deleterious effects.

Problematic Social Media Use

Problematic social media use (PSMU) is a dysregulated urge to use social media, which negatively affects real-life relationships (Andreassen & Pallesen, 2014). Various terms (e.g., addiction, dependency, problematic use) describe the uncontrollable impulse to use online media. The term *problematic use* is preferable to *addiction* or *dependency* for the current study, as it implies degrees of compulsivity yielding negative outcomes and avoids a premature

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diagnosis (Lee et al., 2017). Within a social-cognitive model, problematic use is attributed to declining self-regulation and habit formation (LaRose, 2010).

Researchers have pointed to relationships between PSMU and various constructs in college students and young adults. In examining social media use over time among individuals ages 17 to 19, Stockdale and Coyne (2020) found a positive relationship between initial social media use to alleviate boredom and socially connect and PSMU. Researchers also found college students with higher levels of PSMU reported lower levels of life satisfaction (Wang et al., 2016). Additionally, Lee-Won et al. (2015) found a positive relationship between college students' problematic Facebook use, need for social assurance, and social anxiety. Among college students, depression was also a predictor of PSMU (Kircaburun et al., 2018). Thus, college counselors should consider the relationships between PSMU and the aforementioned mental health concerns when working with students because of the ubiquity of social media in this population. Furthermore, researchers found young adults ages 17 to 25 with anxious attachment styles had higher levels of PSMU (Worsley et al., 2018). This attachment style is associated with a need for social validation, so these individuals may overuse social media to seek connection and relationships without possibly fear-inducing face-to-face interactions (Worsley et al., 2018). Also among young adults, researchers found a relationship between body image and eating disorders likely due to the constant comparison of one's appearance with other users' (Santarossa & Woodruff, 2017). With increased, dysregulated social media use, individuals may become engrossed in the lives of other users and fear missing out on the types of experiences other users are discussing in online posts.

FOMO

FOMO is "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Przybylski et al., 2013, p. 1841). As with social comparison theory (Festinger, 1954), individuals experiencing FOMO compare their lives with others' social media profiles and posts. These users' lives become less satisfying because of upward social comparison. Yet, they spend increased time on social media (Baker et al., 2016) and seek connection with others through viewing their profiles and recent posts. Ultimately, social media can serve as a medium to satisfy the need to belong (Nadkarni & Hofmann, 2012). For college students, this can be enticing as they navigate this social ecosystem.

College students reported experiencing FOMO later in the week and day (Milyavskaya et al., 2018). Consequently, college freshmen with increased FOMO reported having poorer sleep (Adams et al., 2017). Additionally, researchers found FOMO in college students was positively associated with social media intensity and negatively related to social connection and subjective well-being (Roberts & David, 2019). Moreover, college students' psychological needs satisfaction was negatively associated with FOMO (Xie et al., 2018).

FOMO also negatively correlated with emotional well-being and relationship quality (Stead & Bibby, 2017). Furthermore, college students experiencing FOMO indicated increased maladjustment to college life (Alt, 2018). Hence, FOMO is associated with somatic, psychological, and relational difficulties in college students, which is notable for college counselors working with students exhibiting these symptoms, and increased social media use. With FOMO, users tend to become engrossed with the content on their screen instead of the present moment surrounding them, thus possibly limiting their present-moment connections or mindful attention (Baker et al., 2016).

Mindful Attention

Brown and Ryan (2003) defined *mindful attention* as “attention to and awareness of, what is occurring in the present moment” (p. 824). Mindful attention is associated with an overall greater sense of well-being (Brown & Ryan, 2003).

Scholars have identified a number of benefits of mindful attention for college students, and mindfulness-based interventions have attempted to enhance mindful attention to address a myriad of presenting problems in college students (e.g., depression, anxiety, interpersonal problems; Byrne et al., 2013). Among college students, mindful attention related to higher self-esteem and lower social anxiety (Tan et al., 2016). Researchers also found mindfulness was positively associated with trust and social support in college students exposed to trauma with low to moderate posttraumatic stress disorder symptoms (Kuhl & Boyraz, 2017). Additionally, mindful attention predicted use of self-regulation behavior (Kadziolka et al., 2016) and negatively predicted eating disorder symptoms (Meyer & Leppma, 2018) among college students. Furthermore, regarding online behaviors, college students experiencing FOMO (Baker et al., 2016) were less mindfully attentive. Researchers have suggested that college counselors use mindfulness-based interventions to address a variety of presenting problems (e.g., social phobia [Brady & Whitman, 2012]; grief [Newton & Ohrt, 2018]). Although there are no known studies on mindful attention and PSMU in college students, Kircaburun et al. (2019) found a negative relationship between these constructs in adolescents. Thus, research is needed to examine these constructs, as well as FOMO and self-esteem.

The Current Study

In this study, we examined the relationships between PSMU, FOMO, mindful attention, self-esteem, and life satisfaction among college students. We sought to expand on previous research by investigating a mediation model of PSMU, FOMO, and mindful attention. Also, we examined college students' social media use (e.g., frequency, preference, number of accounts). Thus, we

sought to understand further college students' PSMU and its association with other constructs, while contributing to the literature regarding the prevalence and effects of social media use among this population. We examined the following four hypotheses:

Hypothesis 1: There is a positive relationship between FOMO and PSMU.

Hypothesis 2: There is a negative relationship between FOMO and mindful attention, self-esteem, and life satisfaction.

Hypothesis 3: There is a negative relationship between PSMU and mindful attention, self-esteem, and life satisfaction.

Hypothesis 4: Mindful attention mediates the relationship between FOMO and PSMU.

Method

Participants

The participants were 278 undergraduate college students attending a large university in the southeastern United States. They ranged in age from 18 to 53 years old ($M = 20.5$, $SD = 5.4$). Regarding gender, 247 (88.9%) identified as female, 29 (10.4%) identified as male, and one (0.4%) did not provide a response. Regarding race/ethnicity, 197 (70.9%) identified as White, 40 (14.4%) as Hispanic/Latino, 21 (7.6%) as Asian/Pacific Islander, 10 (3.6%) as African American, nine (3.2%) as multiracial, and one (0.4%) as Native American. For class standing, 64 (23.0%) identified as freshmen, 36 (12.9%) as sophomores, 48 (17.3%) as juniors, and 128 (46.0%) as seniors. A majority of participants ($n = 194$, 69.8%) reported a grade point average (GPA) between 3.5 and 4.0 on a 4.0 scale. Half of the participants ($n = 139$, 50.0%) reported involvement in one to two extracurricular activities. (Percentages in this section do not total 100 because of rounding.)

Procedure

Following institutional review board approval, we recruited participants ($n = 75$) from an undergraduate research pool in the College of Education. Individuals in the research pool have the opportunity to participate in studies for course credit, with participation tracked through an online portal. We also recruited participants through online and face-to-face classes in the College of Education for an extra credit opportunity. For the online participants ($n = 110$), a hyperlink directed them to an informed consent form. After agreeing to participate, they were instructed to complete the instruments through the online survey platform Qualtrics (<https://www.qualtrics.com/>). For face-to-face participants ($n = 93$), we gave them a paper informed consent form and paper copies of the instruments.

Instruments

Demographic questionnaire. The demographic questionnaire consisted of 18 questions. These questions included basic personal qualities: age, gender, and race/ethnicity. Additional questions included a focus on class standing, GPA, extracurricular activities, interactions with friends, social media accounts, rates of social media use, and use of mindfulness.

FOMO. We measured FOMO using the 10-item Fear of Missing Out Scale (Przybylski et al., 2013). Respondents rate each item on a 5-point Likert-type scale ranging from 1 (*not at all true of me*) to 5 (*extremely true of me*). Total scores range from 10 to 50, with higher scores reflecting greater feelings of missing out. Sample items include “It bothers me when I miss an opportunity to meet up with friends” and “I fear others have more rewarding experiences than me.” Researchers reported strong validity and internal consistency ($\alpha = .89$; Przybylski et al., 2013). The Cronbach’s alpha for the Fear of Missing Out Scale in this study was .86.

PSMU. We measured PSMU using the Social Media Use Questionnaire (Xanidis & Brignell, 2016), which was developed based on gambling addiction symptoms described in the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; American Psychiatric Association, 2013) and other instruments to assess dysregulated, dependent social media use. The questionnaire consists of nine items, which are rated on a 5-point Likert-type scale ranging from 0 (*never*) to 4 (*always*). Total scores range from 0 to 36, with higher scores indicating PSMU. Examples of items are “I lose track of time when using social media sites” and “I use social media sites when I am in the company of friends.” Researchers reported a Cronbach’s alpha of .87 and strong construct and concurrent validity (Xanidis & Brignell, 2016). In this study, the Cronbach’s alpha was .84.

Mindful attention. We measured mindful attention using the Mindful Attention Awareness Scale (Brown & Ryan, 2003). The scale consists of 15 self-rated items about day-to-day experiences (e.g., “I tend to walk quickly to get where I’m going without paying attention to what I experience along the way”). Respondents rate each item on a 6-point Likert-type scale ranging from 1 (*almost always*) to 6 (*almost never*). Total scores range from 15 to 90, with higher scores suggesting greater trait mindfulness. Researchers reported Cronbach’s alphas ranging from .80 to .89 (Brown & Ryan, 2003; MacKillop & Anderson, 2007). In this study, the Cronbach’s alpha was .88.

Life satisfaction. We measured life satisfaction with the Satisfaction With Life Scale (Diener et al., 1985). The scale comprises five items, which are rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Total scores range from 5 to 35, with higher scores indicating greater life satisfaction. A sample item is “The conditions of my life are excellent.” Pavot and Diener (2008) reported acceptable validity, with Cronbach’s alphas ranging from .79 to .89. The Cronbach’s alpha in this study was .88.

Self-esteem. We used the Rosenberg Self-Esteem Scale (Rosenberg, 1965) to assess self-esteem. The scale consists of 10 items, which are rated on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Five of these items are positively worded (e.g., “I am able to do things as well as most people”), and five are worded negatively (e.g., “At times, I think I am no good at all”). The negatively worded items are reverse coded. Total scores range from 10 to 40, with higher scores indicating higher levels of self-esteem. Sinclair et al. (2010) reported Cronbach’s alphas for the Rosenberg Self-Esteem Scale ranging from .84 to .95. In this study, the Cronbach’s alpha was .85.

Statistical Analysis

We conducted an a priori power analysis using G*Power (Version 3.1.9.3; Faul et al., 2009) to determine the sample size needed for the analyses. The minimum sample size was 95 for the correlations and 68 for the mediation model to detect a medium effect size (power = .80; Cohen, 1992) using a .05 alpha level. We used SPSS (Version 25) to analyze the data. We screened the data for missing values and excluded participants ($n = 19$) who did not complete the survey. Of these excluded participants, 16 did not answer any questions on the instruments. We calculated descriptive statistics for the research variables as well as the demographic questions. We conducted preliminary analyses (e.g., assessing normality, linearity, and multicollinearity and checking for outliers), and only the assumption of normality was violated. We assessed the normality of each variable by using the Shapiro-Wilk test, calculating skewness and kurtosis, and visually investigated histograms and normal quantile-quantile plots. The data for three (FOMO, self-esteem, life satisfaction) out of five variables violated the assumption of normality. Nonetheless, the use of Pearson’s correlations when data are not normally distributed in large samples ($N > 30$) is supported by the central limit theorem (Chang et al., 2006; Feller, 1945). Thus, we conducted a Pearson’s correlation to investigate the relationships between the variables. However, for the mediation model, we used a bootstrapping approach (Preacher & Hayes, 2008), because of the violation of normality, to determine whether mindful attention served as a mediator between FOMO and PSMU. Bootstrapping is an extension of the Sobel test (Baron & Kenny, 1986; Sobel, 1982), which measures the indirect effect of an independent variable on a dependent variable to the null hypothesis of zero. Unlike other approaches, this test of mediation does not rely on the assumption of the results being normally distributed (Preacher & Hayes, 2004).

Results

We used descriptive statistics to investigate participants’ use of social media and mindfulness. Regarding communicating with friends, 270 participants (97%) used text, 194 (70%) used voice call, 193 (69%) used FaceTime, 219 (79%) used Snapchat, 201 (72%) used Instagram, 176 (63%) used Facebook, 104

(37%) used Twitter, and nine (3%) used other platforms. Participants who indicated other used GroupMe, WhatsApp, or video games to communicate with friends. A majority of participants ($n = 144$, 52%) reported having four or more social media accounts. Additionally, 86 participants (31%) reported accessing at least one of their social media accounts 10 or more times daily, with 238 (86%) accessing within the 1st hour of waking and 251 (90%) before falling asleep. Regarding the social media account they log on to most often, 107 participants (39%) reported Instagram, 84 (30%) reported Snapchat, 60 (22%) reported Facebook, and 25 (9%) reported Twitter. Furthermore, 134 participants (48%) used mindfulness.

Results of the Pearson's correlations are presented in Table 1. There was a statistically significant, moderate positive correlation between PSMU and FOMO ($r = .48$, $p < .01$). There was a statistically significant, small inverse correlation between PSMU and life satisfaction ($r = -.12$, $p < .05$), PSMU and self-esteem ($r = -.14$, $p < .05$), and PSMU and mindful attention ($r = -.30$, $p < .01$). Regarding FOMO, there was a statically significant, small inverse relationship between FOMO and life satisfaction ($r = -.29$, $p < .01$), self-esteem ($r = -.21$, $p < .01$), and mindful attention ($r = -.36$, $p < .01$). Additionally, there was a statistically significant, small positive correlation between life satisfaction and self-esteem ($r = .36$, $p < .01$) and mindful attention ($r = .21$, $p < .01$). Finally, there was a statistically significant, small positive correlation between self-esteem and mindful attention ($r = .30$, $p < .01$).

We conducted tests of mediation using the Preacher and Hayes (2004, 2008) bootstrapping approach to investigate mindful attention as a possible mediator for FOMO and PSMU. We found FOMO had a significant indirect effect on PSMU through mindful attention with a 95% bias-corrected and accelerated confidence interval of .01 to .08. Results of the bootstrapping analysis are presented in Table 2 and Figure 1.

Discussion

In this study, we examined social media use, including the most used platforms, number of accounts, methods of communicating with friends, and frequency of use. We also investigated the relationships between PSMU,

TABLE 1
Pearson's Correlations for the Study Variables

Variable	1	2	3	4	5
1. Problematic social media use	—				
2. Fear of missing out	.48**	—			
3. Life satisfaction	-.12*	-.29**	—		
4. Self-esteem	-.14*	-.21**	.36**	—	
5. Mindful attention	-.30**	-.36**	.21**	.30**	—

Note. $N = 278$.

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

TABLE 2
Summary of Mediation Results

Path	<i>B</i>	<i>SE</i>	β	95% CI
FOMO → PSMU ^a	.37	.04	.48***	
FOMO → MA	-.58	.92	-.36***	
MA → PSMU	-.07	.02	-.15**	
FOMO → PSMU ^b	.33	.04	.43***	
FOMO → MA → PSMU	.04	.02	.06**	[.01, .08]

Note. $N = 278$. $\Delta R^2 = .23$, $p < .001$. CI = confidence interval; FOMO = fear of missing out (independent variable); PSMU = problematic social media use (dependent variable); MA = mindful attention (mediator).

^aTotal effect. ^bDirect effect.

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

FOMO, mindful attention, life satisfaction, and self-esteem among college students. Snapchat and Instagram were the most popular platforms among participants. This reflects the younger generation's notable shift away from Facebook (Anderson & Jiang, 2018; Perrin & Anderson, 2019), with the sample's mean age being 20.5 years old. As with previous research indicating that American social media users have a median of three to eight social media platforms (Smith & Anderson, 2018), the majority of participants in our study reported having four or more social media accounts.

In this study, Snapchat was the most popular social media platform for communicating with friends, which is consistent with previous research (Smith & Anderson, 2018). Social media users within the age group of 18 to 24 reported using these platforms multiple times per day (Perrin & Anderson, 2019), and the majority of our participants reported accessing these platforms 10 or more times daily. A majority of participants also reported accessing their accounts upon waking and before falling asleep, which researchers found could impede sleep hygiene, especially in first-year college students experiencing FOMO (Adams et al., 2017).

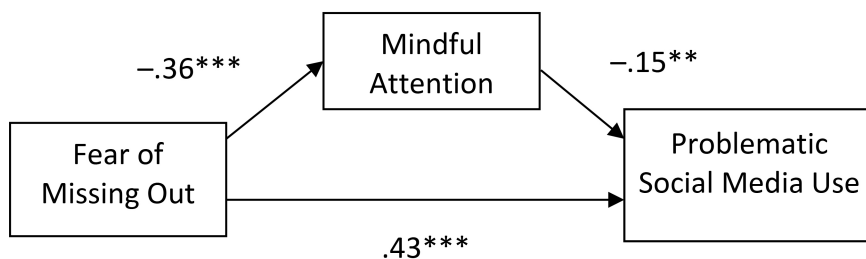


FIGURE 1

Path Analysis of the Mediation Model

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

Regarding Pearson's correlations, there was a positive relationship between FOMO and PSMU, supporting Hypothesis 1. Researchers have found increased use of social media for individuals with greater levels of FOMO (Baker et al., 2016), as well as the relationship between FOMO and other constructs related to PSMU, such as social media addiction and problematic smartphone use (Liu & Ma, 2018). Additionally, there was support for Hypothesis 2, in that FOMO was negatively correlated with mindful attention, self-esteem, and life satisfaction. The inverse relationship between FOMO and life satisfaction aligns with previous findings (i.e., Przybylski et al., 2013) and the idea that the psychological needs of those experiencing FOMO are not being met (Xie et al., 2018). Furthermore, other researchers have found that individuals experiencing higher levels of FOMO have lower levels of self-esteem (Buglass et al., 2017) and are less mindfully attentive (Baker et al., 2016). Hence, lower levels self-esteem could be explained by a greater need for approval and increased sensitivity to social inclusion experienced by individuals with higher levels of FOMO (Lai et al., 2016).

We found support for Hypothesis 3, in that PSMU was negatively correlated with mindful attention, self-esteem, and life satisfaction. The inverse relationships between PSMU and self-esteem and between PSMU and life satisfaction are consistent with previous studies (i.e., Andreassen et al., 2017). Individuals with lower self-esteem use social media with a myriad of motivations (e.g., building social capital), yet they generally receive less positive feedback and attention than other users (Blachnio et al., 2016). Moreover, individuals with higher levels of PSMU and lower levels of life satisfaction could be motivated to use social media as a means to alleviate negative feelings. Furthermore, individuals with higher levels of PSMU are less mindfully attentive, which is consistent with related studies (i.e., Kircaburun et al., 2019). Hence, chronic social media use coincides with a decreased connection with the present moment.

In support of Hypothesis 4, the relationship between FOMO and PSMU was mediated by mindful attention, with decreased mindful attention explaining elevated PSMU in those experiencing FOMO. The results of the mediation analysis may be interpreted using FOMO theory (Przybylski et al., 2013), which suggests that social media users experience a cycle of use. Specifically, users may experience FOMO and associated negative affects (e.g., social envy; Reagle, 2015) and attempt to alleviate these symptoms by increasing their social media use, which in turn engenders more FOMO. Lack of mindful attention strengthens the relationship between FOMO and PSMU, likely due to low self-regulation. By contrast, individuals who practice mindful attention and awareness are able to self-regulate their attention and orientation to the present moment (Malinowski, 2008). In the FOMO cycle, individuals become preoccupied not in their own present moment but in the moments that other users have depicted through posts. Eventually, the FOMO cycle leads to one's social media use becoming dysregulated and problematic.

Implications for College Counselors

In this study, social media was a significant aspect of college students' lives. College counselors should consider asking clients questions about their social

media use during their intake screening (e.g., frequency, favorite platform, likes/dislikes of social media). They could also explore clients' experiences using social media to connect with peers and the campus community during sessions (e.g., friending a classmate, learning about campus events through social media posts). Additionally, the majority of participants used these platforms before bed and upon waking. Scholars have reported one's social media use affects sleep hygiene (Adams et al., 2017). Hence, college counselors working with students who report sleep difficulties could inquire as to whether the students are using social media during these hours. Counselors may then explore students' need to access social media at this time and work with them to find an alternative bedtime routine.

It is also noteworthy that students who reported greater levels of PSMU also indicated a higher frequency of FOMO, as well as lower levels of self-esteem, life satisfaction, and mindful attention. This increased use could be a desire for social connection without the inherent risk of rejection and vulnerability. Hence, college counselors can work to build rapport and create a safe space to explore students' feelings of self-esteem and life satisfaction in relation to their social media or online use. Counselors can also educate students on the effects of overusing and misusing these platforms and can promote intentional, mindful social media use. Furthermore, we found being mindfully attentive attenuates the path from FOMO to PSMU. Hence, college counselors could work to improve problematic users' mindful attention. Counselors may use a mindfulness-based intervention to help users increase their mindful attention and awareness to possibly ameliorate the negative effects of FOMO and PSMU. For example, Weaver and Swank (2019) outlined a mindfulness-based intervention for adolescent social media users. College counselors could use this as a guide for applying mindful principles to social media use.

Limitations and Directions for Future Research

Several limitations should be considered when interpreting the results of this study. The sample consisted of students from a large public university in the southeastern United States. In addition, the participants were predominantly female and White. These factors limit the generalizability of the results. Future research should include participants from different regions of the United States and diverse groups. Researchers might also investigate causality with these constructs through a study using an experimental design. This may include examining the effectiveness of an intervention designed to address maladaptive social media use (i.e., Weaver & Swank, 2019), while also examining well-being (e.g., self-esteem) in conjunction with social media-related constructs (e.g., FOMO).

Conclusion

Social media is ubiquitous among college students, with the majority reporting accessing these platforms multiple times daily. We aimed to contribute to

existing research on the potential negative effects of dysregulated, excessive social media use among college students. College students' PSMU and FOMO inversely related to mindful attention, self-esteem, and life satisfaction. College counselors may wish to explore these constructs with clients reporting increased social media use and symptoms of FOMO. Additionally, mindful attention inversely mediated the relationship between FOMO and PSMU. Thus, college counselors might consider using mindfulness to ameliorate their clients' PSMU and FOMO.

References

- Adams, S. K., Williford, D. N., Vaccaro, A., Kisler, T. S., Francis, A., & Newman, B. (2017). The young and the restless: Socializing trumps sleep, fear of missing out, and technological distractions in first-year college students. *International Journal of Adolescence and Youth*, 22(3), 337–348. <https://doi.org/10.1080/02673843.2016.1181557>
- Alt, D. (2018). Students' wellbeing, fear of missing out, and social media engagement for leisure in higher education learning environments. *Current Psychology*, 37(1), 128–138. <https://doi.org/10.1007/s12144-016-9496-1>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, M., & Jiang, J. (2018, May 31). *Teens, social media & technology*. Pew Research Center. <https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/>
- Andreassen, C., & Pallesen, S. (2014). Social network site addiction: An overview. *Current Pharmaceutical Design*, 20(25), 4053–4061. <https://doi.org/10.2174/13816128113199990616>
- 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>
- Baker, Z. G., Krieger, H., & LeRoy, A. S. (2016). Fear of missing out: Relationships with depression, mindfulness, and physical symptoms. *Translational Issues in Psychological Science*, 2(3), 275–282. <https://doi.org/10.1037/tps0000075>
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182. <https://doi.org/10.1037/0022-3514.51.6.1173>
- Blachnio, A., Przepiorka, A., & Pantic, I. (2016). Association between Facebook addiction, self-esteem and life satisfaction: A cross-sectional study. *Computers in Human Behavior*, 55(Pt. B), 701–705. <https://doi.org/10.1016/j.chb.2015.10.026>
- Brady, V. P., & Whitman, S. M. (2012). An acceptance and mindfulness-based approach to social phobia: A case study. *Journal of College Counseling*, 15(1), 81–96. <https://doi.org/10.1002/j.2161-1882.2012.00007.x>
- Brown, K. W., & Ryan, R. M. (2003). The benefits of being present: Mindfulness and its role in psychological well-being. *Journal of Personality and Social Psychology*, 84(4), 822–848. <https://doi.org/10.1037/0022-3514.84.4.822>
- Buglass, S. L., Binder, J. F., Betts, L. R., & Underwood, J. D. M. (2017). Motivators of online vulnerability: The impact of social network site use and FOMO. *Computers in Human Behavior*, 66, 248–255. <https://doi.org/10.1016/j.chb.2016.09.055>
- Byrne, C., Bond, L. A., & London, M. (2013). Effects of mindfulness-based versus interpersonal process group intervention on psychological well-being with a clinical university population. *Journal of College Counseling*, 16(3), 213–227. <https://doi.org/10.1002/j.2161-1882.2013.00038.x>
- Chang, H., Huang, K., & Wu, C. (2006). Determination of sample size in using central limit theorem for Weibull distribution. *International Journal of Information and Management Sciences*, 17(3), 31–46.

- Cohen, J. (1992). Statistical power analysis. *Current Directions in Psychological Science*, 1(3), 98–101. <https://doi.org/10.1111/1467-8721.ep10768783>
- Diener, E. D., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment*, 49(1), 71–75. https://doi.org/10.1207/s15327752jpa4901_13
- Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, 41(4), 1149–1160. <https://doi.org/10.3758/BRM.41.4.1149>
- Feller, W. (1945). The fundamental limit theorems in probability. *Bulletin of the American Mathematical Society*, 51, 800–832. <https://doi.org/10.1090/S0002-9904-1945-08448-1>
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7(2), 117–140. <https://doi.org/10.1177/001872675400700202>
- Kadziolka, M. J., Di Pierdomenico, E. A., & Miller, C. J. (2016). Trait-like mindfulness promotes healthy self-regulation of stress. *Mindfulness*, 7(1), 236–245. <https://doi.org/10.1007/s12671-015-0437-0>
- Kim, B., & Kim, Y. (2017). College students' social media use and communication network heterogeneity: Implications for social capital and subjective well-being. *Computers in Human Behavior*, 73, 620–628. <https://doi.org/10.1016/j.chb.2017.03.033>
- Kircaburun, K., Griffiths, M. D., & Billieux, J. (2019). Trait emotional intelligence and problematic online behaviors among adolescents: The mediating role of mindfulness, rumination, and depression. *Personality and Individual Differences*, 139, 208–213. <https://doi.org/10.1016/j.paid.2018.11.024>
- Kircaburun, K., Kokkinos, C. M., Demetrovics, Z., Király, O., Griffiths, M. D., & Çolak, T. S. (2018). Problematic online behaviors among adolescents and emerging adults: Associations between cyberbullying perpetration, problematic social media use, and psychosocial factors. *International Journal of Mental Health and Addiction*, 17(4), 1–18. <https://doi.org/10.1007/s11469-018-9894-8>
- Kuhl, M., & Boyraz, G. (2017). Mindfulness, general trust, and social support among trauma exposed college students. *Journal of Loss and Trauma*, 22(2), 150–162. <https://doi.org/10.1080/15325024.2016.1212610>
- Lai, C., Altavilla, D., Ronconi, A., & Aceto, P. (2016). Fear of missing out (FOMO) is associated with activation of the right middle temporal gyrus during inclusion social cue. *Computers in Human Behavior*, 61, 516–521. <https://doi.org/10.1016/j.chb.2016.03.072>
- LaRose, R. (2010). The problem of media habits. *Communication Theory*, 20(2), 194–222. <https://doi.org/10.1111/j.1468-2885.2010.01360.x>
- Lee, E. W. J., Ho, S. S., & Lwin, M. O. (2017). Explicating problematic social network sites use: A review of concepts, theoretical frameworks, and future directions for communication theorizing. *New Media & Society*, 19(2), 308–326. <https://doi.org/10.1177/1461444816671891>
- Lee-Won, R. J., Herzog, L., & Park, S. G. (2015). Hooked on Facebook: The role of social anxiety and need for social assurance in problematic use of Facebook. *Cyberpsychology, Behavior, and Social Networking*, 18(10), 567–574. <https://doi.org/10.1089/cyber.2015.0002>
- Liu, C., & Ma, J. (2018). Social support through online social networking sites and addiction among college students: The mediating roles of fear of missing out and problematic smartphone use. *Current Psychology: A Journal for Diverse Perspectives on Diverse Psychological Issues*, 39, 1892–1899. <https://doi.org/10.1007/s12144-018-0075-5>
- MacKillop, J., & Anderson, E. J. (2007). Further psychometric validation of the Mindful Attention Awareness Scale (MAAS). *Journal of Psychopathology and Behavioral Assessment*, 29(4), 289–293. <https://doi.org/10.1007/s10862-007-9045-1>
- Malinowski, P. (2008). Mindfulness as psychological dimension: Concepts and applications. *The Irish Journal of Psychology*, 29(1–2), 155–166. <https://doi.org/10.1080/03033910.2008.10446281>
- Meyer, L. P., & Leppma, M. (2018). The role of mindfulness, self-compassion, and emotion regulation in eating disorder symptoms among college students. *Journal of College Counseling*, 22(3), 211–224. <https://doi.org/10.1002/jocc.12138>

- Milyavskaya, M., Saffran, M., Hope, N., & Koestner, R. (2018). Fear of missing out: Prevalence, dynamics, and consequences of experiencing FOMO. *Motivation and Emotion*, 42(5), 725–737. <https://doi.org/10.1007/s11031-018-9683-5>
- Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, 52(3), 243–249. <https://doi.org/10.1016/j.paid.2011.11.007>
- Newton, T. L., & Ohrt, J. H. (2018). Infusing mindfulness-based interventions in support groups for grieving college students. *Journal for Specialists in Group Work*, 43(2), 166–183. <https://doi.org/10.1080/01933922.2018.1431347>
- Pavot, W., & Diener, E. (2008). The Satisfaction With Life Scale and the emerging construct of life satisfaction. *The Journal of Positive Psychology*, 3(2), 137–152. <https://doi.org/10.1080/17439760701756946>
- Perrin, A., & Anderson, M. (2019, April 10). *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/>
- Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers*, 36(4), 717–731. <https://doi.org/10.3758/BF03206553>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods*, 40(3), 879–891. <https://doi.org/10.3758/BRM.40.3.879>
- Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29(4), 1841–1848. <https://doi.org/10.1016/j.chb.2013.02.014>
- Reagle, J. (2015). *Following the Joneses: FOMO and conspicuous sociality*. <https://firstmonday.org/ojs/index.php/fm/article/view/6064/4996>
- Roberts, J. A., & David, M. E. (2019). The social media party: Fear of missing out (FoMO), social media intensity, connection, and well-being. *International Journal of Human-Computer Interaction*, 36(4), 386–392. <https://doi.org/10.1080/10447318.2019.1646517>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press.
- Santarossa, S., & Woodruff, S. J. (2017). #SocialMedia: Exploring the relationship of social networking sites on body image, self-esteem, and eating disorders. *Social Media + Society*, 3(2), 1–10. <https://doi.org/10.1177/2056305117704407>
- Sinclair, S. J., Blais, M. A., Gansler, D. A., Sandberg, E., Bistis, K., & LoCicero, A. (2010). Psychometric properties of the Rosenberg Self-Esteem Scale: Overall and across demographic groups living within the United States. *Evaluation & the Health Professions*, 33(1), 56–80. <https://doi.org/10.1177/0163278709356187>
- Smith, A., & Anderson, M. (2018, March 1). *Social media use in 2018*. <https://www.pewinternet.org/2018/03/01/social-media-use-in-2018/>
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology*, 13, 290–312. <https://doi.org/10.2307/270723>
- Stead, H., & Bibby, P. A. (2017). Personality, fear of missing out and problematic internet use and their relationship to subjective well-being. *Computers in Human Behavior*, 76, 534–540. <https://doi.org/10.1016/j.chb.2017.08.016>
- Stockdale, L. A., & Coyne, S. M. (2020). Bored and online: Reasons for using social media, problematic social networking site use, and behavioral outcomes across the transition from adolescence to emerging adulthood. *Journal of Adolescence*, 79, 173–183. <https://doi.org/10.1016/j.adolescence.2020.01.010>
- Tan, J., Lo, P., Ge, N., & Chu, C. (2016). Self-esteem mediates the relationship between mindfulness and social anxiety among Chinese undergraduate students. *Social Behavior and Personality: An International Journal*, 44(8), 1297–1304. <https://doi.org/10.2224/sbp.2016.44.8.1297>
- Vanden Abeele, M., Hendrickson, A. T., Pollmann, M. M. H., & Ling, R. (2019). Phubbing behavior in conversations and its relation to perceived conversation intimacy and distraction: An exploratory observation study. *Computers in Human Behavior*, 100, 35–47. <https://doi.org/10.1016/j.chb.2019.06.004>

- Wang, J. L., Gaskin, J., Wang, H. Z., & Liu, D. (2016). Life satisfaction moderates the associations between motives and excessive social networking site usage. *Addiction Research & Theory*, 24(6), 450–457. <https://doi.org/10.3109/16066359.2016.1160283>
- Weaver, J. L., & Swank, J. M. (2019). Mindful connections: A mindfulness-based intervention for adolescent social media users. *Journal of Child and Adolescent Counseling*, 5(2), 103–112. <https://doi.org/10.1080/23727810.2019.1586419>
- Worsley, J. D., McIntyre, J. C., Bentall, R. P., & Corcoran, R. (2018). Childhood maltreatment and problematic social media use: The role of attachment and depression. *Psychiatry Research*, 267, 88–93. <https://doi.org/10.1016/j.psychres.2018.05.023>
- Xanidis, N., & Brignell, C. M. (2016). The association between the use of social network sites, sleep quality and cognitive function during the day. *Computers in Human Behavior*, 55(Pt. A), 121–126. <https://doi.org/10.1016/j.chb.2015.09.004>
- Xie, X., Wang, Y., Wang, P., Zhao, F., & Lei, L. (2018). Basic psychological needs satisfaction and fear of missing out: Friend support moderated the mediating effect of individual relative deprivation. *Psychiatry Research*, 268, 223–228. <https://doi.org/10.1016/j.psychres.2018.07.025>