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Conceptualizing Social Media Contingent Self-Esteem: Associations Between Echo Chambers, Contingent Self-Esteem, and Problematic Social Media Use

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Abstract

How social media influences users depends largely on motivations for its use and how the user interprets social media-facilitated interactions. Contingent self-esteem, a construct rooted in self-determination theory (Deci & Ryan, 2000), can account for differential effects, including addictive use. Three preregistered studies ($n_{total} = 822$) derived social media contingent self-esteem (SMCSE) and examined the factor structure and associations with social media use, addiction, and disorder criteria. Study 1 ($N = 412$) analyzed exploratory and confirmatory factors. Study 2 ($N = 230$) examined associations with other domains of contingent self-esteem, basic psychological needs satisfaction and frustration, and measures of social media use and addiction. Study 3 ($N = 192$) examined associations between SMCSE, identity bubble reinforcement (echo chambers), and social media outcomes. SMCSE was associated with greater social media use and intensity, identity bubble reinforcement, social media addiction, and disorder criteria. Exploratory support was found for mediation models in which identity bubble reinforcement predicted greater SMCSE, which in turn predicted a greater likelihood of social media addiction and disorder.

Keywords: social media; contingent self-esteem; addiction; motivation; self-determination

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Introduction

According to a recent Pew Research survey, seven in ten adults in the United States reported using any social media site (Pew Research, 2021). It has been estimated that 90% of people aged 18–29 are active on social media, followed by 82% of those aged 30–49, 50–64 (69%), and 65 + (40%; Statista, 2023). Between 2016 and 2022, users spent, on average, 2–3 hours per day on social media sites (Statista, 2023). These estimates are likely to increase (Kemp, 2023). While these estimates are striking, not all users have similar outcomes from using social media (e.g., Huang, 2017). For example, social media can enable one to seek out positive social relationships and gain a sense of community belonging (Nadkarni & Hoffman, 2012), mitigating loneliness (Pittman & Reich, 2016). Relationships facilitated on social media have also been found to exacerbate anxiety, depression, and emotion dysregulation (Elhai et al., 2018; Huang, 2017). However, these effects may largely depend on one's motivation to use and interpret social media information. Theory and research on contingent self-esteem (Crocker & Park, 2004; Deci & Ryan, 2000; Kernis & Goldman, 2006; Knee et al., 2008) suggests that individuals' emotional health and well-being

are not equally affected by events and outcomes in specific domains. The extent to which individuals' self-esteem is contingent with regard to social media use, or social media contingent self-esteem, may be an important predictor of social media activity and social media addiction.

Social Media: When Is It Positive and Negative?

It has been argued that social media use is not inherently good or bad (Huang, 2017; Kross et al., 2021; Orben & Przybylski, 2019a; Orben et al., 2019; Sabik et al., 2020). Rather, it is how users engage with social media that partly determines social media effects (Gilmour et al., 2020; Kross, 2021). Some research has found positive associations between social media use (e.g., posting and updating one's status on Facebook, Instagram, and TikTok) and positive social and psychological outcomes. For example, self-disclosures made on social media have facilitated social support and reduced stress (e.g., Gilmour et al., 2020), maintained group connections (Nadkarni & Hofmann, 2012), and fostered social capital (Ellison et al., 2007; Verduyn et al., 2017). Social media use has also been shown to mitigate loneliness, improving well-being (Lee et al., 2013). Other literature has cited a proliferation of contradictory findings, false positives, and confusion regarding social media's influence on psychological well-being (e.g., Orben & Przybylski, 2019b). For example, some studies have suggested a slight negative correlation between social media addiction and self-esteem and well-being over time (Cingel et al., 2022; Orben & Przybylski, 2019a), whereas other research has suggested considering individual differences and demographics more closely (O'Day & Heimberg, 2021; Twenge et al., 2020). Given these mixed findings, person-specific variables could better explain the variability in how social media relates to psychological well-being (Cingel et al., 2022; Valkenburg et al., 2021).

Conceptualizing Social Media Use: Addiction, Disorder, and Problematic Social Media Use

Social media has become integral to daily life globally (Carr, 2021). This increasing reliance on social media has raised public health concerns regarding its impact on psychological well-being. Receiving particular attention are the psychological symptoms of individuals who frequently use social media (e.g., Dhir et al., 2018; Van den Eijnden et al., 2016). Several definitions and measures have been put forth to describe maladaptive, addiction-like social media use, such as "compulsive", "problematic", "addictive", or "disordered" use. For example, social media addiction has been defined as "being overly concerned about social media, driven by an uncontrollable motivation to log on to or use social media, and devoting so much time and effort to social media that it impairs other important life areas" (Andreassen & Pallesen, 2014, p. 4054). The Bergen Facebook Addiction Scale (BFAS; Andreassen et al., 2012) is among the most cited social media use scales that examine social media addiction directly. The BFAS operationalized Facebook addiction according to addiction criteria: salience (i.e., prioritizing social media over other activities), mood modification (i.e., reliance on social media for coping), conflict (i.e., conflict with others regarding social media use), withdrawal symptoms (i.e., unpleasant feelings and physical effects when away from social media), and relapse (i.e., loss of control of social media), as is consistent with other diagnostic criteria (Griffiths, 2010). The BFAS was later adapted and validated for general social media use in the Bergen Social Media Addiction Scale (BSMAS; e.g., Andreassen et al., 2017).

Other research efforts have developed additional social media diagnostic tools, such as the 9-item Social Media Disorder Scale (SMD; Van Eijnden et al., 2016), which derives diagnostic criteria from Internet Gaming Disorder (IGD; APA, 2013). The SMD scale features nine diagnostic criteria: preoccupation (i.e., difficulty not being around social media), tolerance (i.e., desire to check social media more frequently), withdrawal (i.e., restlessness when unable to use social media), persistence (i.e., failed attempts to use social media), displacement (i.e., neglecting other activities to be on social media), problem (i.e., arguments, lack of sleep due to social media use), deception (i.e., hiding social media use from others), escape (i.e., use of social media as a distraction), and conflict (i.e., interpersonal conflict due to social media use; for review, see Van Eijnden et al., 2016). Despite using terms derived from the DSM-V, social media disorder and social media addiction remain excluded from this guide (APA, 2013).

Multiple scholars have expressed concerns regarding pathologizing social media use and constructs related to social media. For example, research concerning social media use has opted for terms like "problematic" social media use (e.g., van Rooij et al., 2017). Specifically, scholars have called into question the utility of the Bergen Addiction Scale in diagnosing behaviors consistent with disorder pathology (see Fournier et al., 2023; Panova & Carbonell, 2022), leading to a lack of agreement on the utility of such measures. Despite these concerns, the BFAS and SMD are two of the most cited measures in identifying and classifying addictive and disordered use,

respectively, and have been used extensively to evaluate problematic use cross-culturally (e.g., Cheng et al., 2021) and across age groups (Paakari et al., 2021). To remain consistent with the majority of this literature while recognizing the nuances of terminology, we define social media addiction and disorder to reflect the construct being measured rather than a concrete diagnosis (Sun & Zhang, 2021).

Several studies have reported associations between problematic social media use and negative indicators of psychological well-being, including depression and rumination (Baker & Algorta, 2016; Primack et al., 2017; Shannon et al., 2022). Sharing content on social media has been criticized for encouraging upward social comparisons (Gomez et al., 2021; Vogel et al., 2014) and increasing self-enhancement strategies associated with lower well-being (Verduyn et al., 2017). Similar effects have been found even when browsing posts rather than actively “posting” or “updating” (Midgley et al., 2021). The literature reviewed thus far suggests that additional variables may play an important role in the detection and prevention of social media addiction and other negative psychological symptoms.

Contingent Self-Esteem

One approach to studying how, when, and why events can affect psychological well-being is the notion of contingent self-esteem (Crocker & Wolfe, 2001). This literature has argued that events within a particular domain affect the self primarily when one’s self is invested in and highly “contingent” on outcomes in that domain (Crocker & Park, 2004; Crocker & Wolfe, 2001). Success and failure or acceptance and rejection in self-relevant domains resulted in increased affect intensity and fluctuations in self-esteem relative to less self-relevant domains (Crocker et al., 2003). People can become preoccupied with the meaning of events in these self-contingent domains because outcomes generalize to the worth and value of the whole person (Crocker & Park, 2004). The literature on contingent self-esteem is extensive and has been examined in several domains, such as staking one’s self-worth on academic performance (Crocker & Wolfe, 2001), intimate relationships (Knee et al., 2008; Underwood et al., 2023), financial well-being (Ward et al., 2021), friendships (Cambron et al., 2010), or physical appearance (Patrick et al., 2004). When self-esteem is contingent in a given domain, even small, otherwise minor adverse events and responses can take on grand meaning (Crocker & Park, 2004).

Research on social media has primarily focused on measures of global self-esteem (e.g., Faelens et al., 2021) or contingent self-esteem in other domains, such as other’s approval (Kanat-Maymon et al., 2018). In other words, research on self-esteem and social media use has focused on how individuals who are already higher or lower in global self-esteem (e.g., Rosenberg, 1965) use and react to social media or how social media use predicts or changes individuals’ level of state self-esteem (Saiphoo et al., 2020). Faelens and colleagues (2021), using a 14-day experience-sampling design, found evidence for a positive relationship between time spent on social media and negative self-esteem. Importantly, their findings identified low self-esteem as a catalyst for rumination and negative affect. The degree to which one’s self-esteem is contingent in a particular domain predicts the strength of affective and self-evaluative responses to events and experiences in that domain (Crocker & Park, 2004; Kernis & Goldman, 2006). Indeed, Cingel and colleagues (2022) have emphasized the need for increased research on individual susceptibilities rather than exploring general self-esteem effects across users. Thus, we suggest that individuals vary in the degree to which their self-esteem is contingent on social media and that this plays a role in social media use, self-evaluations, and social media addiction.

Social Media Contingent Self-Esteem

Although it has been emphasized that domain-specificity is instrumental to identifying and delineating effects (Crocker & Park, 2004), research has not yet examined contingent self-esteem specific to social media use. The current research adapted a novel measure of self-esteem contingent on social media use (SMCSE) derived from contingent self-esteem constructs in other domains (Crocker & Park, 2004; Kernis & Goldman, 2006; Knee et al., 2008). We conceptualize SMCSE as having one’s self-regard hooked on the perceived nature, process, and outcomes of one’s experiences on social media. When self-esteem is highly contingent, one becomes more emotionally invested in the judgments, evaluations, and behaviors within it, which can take on more substantial meaning for one’s global sense of self (Hodgins & Knee, 2002; Ryan & Deci, 2018). Thus, to someone higher in SMCSE, minor “positive” and “negative” social media experiences can become significant because of their implications for global self-worth, provoking a stronger emotional response and greater undulations in one’s self-worth. Perceived positive experiences such as in the case of receiving affirming, supportive comments and

evaluations, could result in a more positive emotional response and a bolstering of self-worth. Yet, contingent self-esteem has been shown to have costs for trait self-esteem over time because declines in self-worth following negative events tend to outweigh increases in self-worth following positive events (Crocker & Park, 2004). Consistent with this, Kanat-Maymon and colleagues (2018) found that contingent self-worth in the domain of others' approval was linked to Facebook addiction and excessive usage. Further, daily fluctuations in social acceptance and contingent self-worth facilitated daily changes in addiction.

How SMCSE Advances Knowledge on Self-Esteem and Social Media Use

SMCSE derives from perspectives on authenticity of the self (Deci & Ryan, 1995; Hodgins & Knee, 2002; Kernis, 2003). Based on these theories, contingent self-esteem emerges when basic psychological needs for autonomy, competence, and relatedness are frustrated (rather than supported) by one's social environment. In this way, SMCSE reflects a lack of autonomy when engaging in social media out of compulsion, guilt, or pressure rather than interest and enjoyment (e.g., Masur et al., 2014). SMCSE also reflects feelings of incompetence in that one feels less in control of others' reactions to one's shared content, strongly seeking others' approval, and strongly avoiding others' disagreement and disapproval. Finally, SMCSE reflects a lack of experiencing unconditional positive regard from others as this regard depends on what one shares or expresses about oneself on social media. In this way, SMCSE is more likely when individuals have identity bubbles on social media, in which one's social network is more cultivated with like-minded people than people with opposing views and perspectives (Kaakinen et al., 2020). Thus, SMCSE integrates theoretical perspectives on optimal self-esteem, and suggests how and why social media experiences can undermine self-esteem, and who is most susceptible to negative social media experiences and addiction.

Overview

In three preregistered studies, we adapted items from general contingent self-esteem (Kernis & Goldman, 2006) to assess SMCSE, examined the factor structure, and computed associations with other measures of contingent self-esteem, basic psychological needs, social media use, and addiction. Study 1 involved item adaptation and conducting exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). Study 2 repeated the EFA and CFA on an independent sample and examined convergent validity associations between SMCSE and other measures of contingent self-esteem, basic psychological needs, social media use, and addiction. Study 3 examined further associations between SMCSE and the tendency to have "identity bubbles", or echo chambers, on social media, along with social media addiction and disorder symptomology. A priori tests of SMCSE as a moderator of how identity bubble reinforcement predicts social media addiction and disorder were examined, as well as exploratory analyses of SMCSE as a mediator of the identity bubble—addiction association.

Study 1

Methods

Preregistration and Power Analysis

This study was preregistered [here](#) for the EFA and [here](#) for the CFA. The estimate of 400 responses is based on 20 participants per item as recommended by Burns et al. (2008) on the Social Media Contingent Self-Esteem Scale for EFA and CFA.¹

Participants and Procedure

Participants ($n = 412$) were recruited from undergraduate participant pools between January and April 2021, were over 18 years old, and were social media users. Participants were randomly separated into two groups ($n = 206$ participants each). Due to missing data, 189 and 203 participants were retained for samples 1 and 2, respectively. Instagram was the most popular media site (87.4%), followed by Snapchat (77.2%), X (previously known as Twitter; 56.3%), Facebook (49%), TikTok (26.9%), and Reddit (1.70%). Participants (5.8%) wrote in other media, including Discord, YouTube, Pinterest, iFunny, LinkedIn, Weibo, and Tumblr. In the first sample, 86.34% were female (13.66%

male; no participants identified as other or preferred not to say). In the second sample, 82.35% were female (15.69% male; 1.96% other or preferred not to say). The mean age across both samples was 22.79 years ($SD = 4.74$). The University of Houston Institutional Review Board approved the study before data collection.

Measures

Social Media Contingent Self-Esteem Scale. The initial scale comprised 15 items adapted from the General Contingent Self-Esteem Scale (Kernis & Goldman, 2006) but explicitly in reference to the social media domain. All items are provided in Table 1. Items were presented on a 7-point Likert scale with answers ranging from 1 (*not at all like me*) to 7 (*very much like me*). Item 2 (*My self-worth is unaffected when things go wrong in my social media*) and 12 (*When I lose friends or followers on social media, my feelings of self-worth remain unaffected*), were reverse-scored. Items were averaged to compute an overall score.

Table 1. Social Media Contingent Self-Esteem Items and EFA and CFA Factor Loadings and Cross-Loadings for Study 1.

Item	EFA Loadings			CFA Loadings		
	F1	F2	F3	F1	F2	F1
1. I feel better about myself when I check social media.	.75	.02	-.17	.64		.63
2. An important measure of my self-worth is how popular I am on social media.	.71	.04	.22	.66		.63
3. I feel better about myself when I update social media.	.80	-.01	.10	.78		.76
4. My feelings of self-worth are based on how well things are going in my social media.	.85	-.14	.28	.68		.65
5. I feel better about myself when I log into social media.	.89	-.04	-.12	.79		.76
6. When my social media activity is going well, I feel better about myself overall.	.61	.24	.05	.82		.79
7. I feel better about myself when I contribute to social media.	.78	.03	.02	.89		.87
8. My self-worth is unaffected when things go wrong in my social media.	.03	.20	.54			
9. I feel better about myself when I share information on social media.	.73	.13	.01	.72		.70
10. When I get into arguments on social media, I feel bad about myself in general.	.13	.44	.18			
11. I feel better about myself when I participate on social media.	.66	.25	-.10	.84		.83
12. When I lose friends or followers on social media, my feelings of self-worth remain unaffected.	-.04	.00	.55			
13. I feel better about myself when I use social media.	.75	.01	-.26	.74		.73
14. When others criticize me on social media, it makes me feel really bad.	.02	.73	.14		.67	
15. I feel better about myself when others tell me that they like what I share on social media.	.11	.69	.54		.89	

Note. Study 1 is divided into two separate samples for EFA ($n = 189$) and CFA ($n = 203$). Items in bold reflect final retained items after the final CFA of sample 2. Factor 2 was ultimately dropped because items 14 and 15 do not have clear conceptual interpretation. We checked the two factor solution in the CFA to be thorough and to address reviewers. Due to missing data, 1 participant and 3 participant responses were dropped from the EFA and CFA, respectively. Internal reliability of the final items yielded Cronbach's alpha of .93 and McDonald's omega of .94

Results and Discussion

Preliminary Tests of Normality

The total sample was randomly divided into two datasets, with EFA conducted on one dataset and CFA conducted on the second. Given the sample size and based on recommendations by Mishra et al. (2019), we conducted normality tests of the EFA and CFA samples, named Sample 1 and Sample 2, respectively. Results indicated that data for Sample 1 SMCSE were normally distributed as skewness (0.504) and kurtosis (-0.325) were within ± 1 . Interquartile range (IQR) was 1.66 (1.80–3.46).

For Sample 2 ($n = 203$), normality tests indicated normal distribution; skewness = 0.300, kurtosis = 0.768. Critical ratio of skewness (0.265) and kurtosis (0.676) also indicated normality.

EFA

The PROC FACTOR routine in SAS specified promax (oblique) rotation, with priors set to squared multiple correlations, yielding an exploratory factor analysis on Sample 1. A scree plot of the eigenvalues and conceptual interpretability suggested a single-factor solution. Still, two items did load on a potential second factor. Accordingly, we report all eigenvalues and rotated factor loadings for the first three potential factors for full transparency below and in Table 1. The first factor yielded an eigenvalue of 7.30, accounting for 83% of the variance and capturing 10 items with loadings above .60. The eigenvalue for the next factor was 1.09 and captured two items (items 14 and 15). Item 14 (*When others criticize me on social media, it makes me feel really bad*) and item 15 (*I feel better about myself when others tell me that they like what I share on social media*) do not suggest an interpretable factor, and the original scale we adapted this from also yields a single score (General Contingent Self-Esteem; Kernis & Goldman, 2006). The eigenvalue of the third potential factor was .55 and captured no items with loadings above .60. Accordingly, the 10 items loading onto the first factor were retained, yielding Cronbach's $\alpha = .94$. Scale items, item descriptives, and all factor loadings for the EFA are provided in Table 1.

CFA

Sample 2 was used for CFA to confirm the 10-item solution, but also to further rule out the 12-item two factor solution and to further improve parsimony and maximize internal reliability if possible. The analysis was conducted using Mplus 7.11. Goodness of fit was determined by the root mean square error of approximation (RMSEA) $< .08$, comparative fit index (CFI) $> .9$, Tucker Lewis Index (TLI) $> .9$, and the standardized root mean squared residual (SRMR) $< .1$ to maximize the fit of items (Hu & Bentler, 1999). Model information criteria were determined using the Akaike information criterion (AIC) and the Bayesian information criteria (BIC). Vrieze (2012) suggested that lower values indicate better model fit.

We began with testing the two factor 12-item solution that we ruled out for interpretability reasons in the EFA. As expected, this yielded a poor fit, $\chi^2(53) = 336.38, p < .001$, RMSEA = .162, CFI = .835, TLI = .792, SRMR = .075, and model information criteria were AIC = 7,785.084, BIC = 7,907.67, and -2 Loglikelihood Ratio (-2 LL) = -368.355 . Next, we tested the 10-item single factor final solution from the EFA. The 10-item solution also yielded a poor fit, but was somewhat improved, as expected; $\chi^2(36) = 268.739, p < .001$, RMSEA = .178, CFI = .842, TLI = .803. The SRMR = .087 indicated adequate fit. Model information criteria were AIC = 6,268.891, BIC = 6,364.974, and the -2 LL = 2,971.076.

To see whether the scale could be more parsimonious with equal or improved internal reliability, the fit was tested after dropping the two items with factor loadings $< .65$ (items 1 and 2), which an item-total (minus that item) correlation analysis also suggested could improve internal reliability. This indeed yielded an 8-item solution with better fit, $\chi^2(21) = 127.18, p < .001$, RMSEA = .158, CFI = .91, TLI = .876, SRMR = .083. Information criteria also improved, AIC = 5,016.86, BIC = 5,093.06, with the -2 LL = $-2,423.675$. Internal reliability yielded Cronbach's alpha of .93 and McDonald's omega of .94. Based on recommendations (Hu & Bentler, 1999), the 8-item single factor solution met the minimum preregistered criteria for CFI and SRMR. The TLI and RMSEA indicated a less-than-adequate model fit, although these were marginal. As all model fit criteria and model information criteria preferred this final model, this was the final solution. We checked this model within Study 2 for further confirmation on an independent sample. Scale items and factor loadings for each CFA are also provided in Table 1.

Study 2

Study 2 repeated the EFA and CFA on the 8-item scale and examined associations between SMCSE and (a) other measures of contingent self-esteem, (b) basic psychological needs satisfaction and frustration, (c) obsessive and harmonious passion, and (d) social media use, motives, and addiction measures. Contingent self-esteem in a given domain would be expected to share variance with contingent self-worth in related domains, as evidence of convergent validity. High self-esteem contingent in a particular domain would likely relate to contingent self-worth with regard to others' approval, one's family, and one's appearance, domains which are commonly shared across social media platforms (Crocker & Wolfe, 2001). Continued positive reinforcement of one's beliefs and ideas should be more desirable for those higher in SMCSE, and thus, they would be more likely to have a social media

environment of like-minded social media users, reflected by stronger identity bubbles or “echo chambers” (Kaakinen et al., 2020).

The next set of measures included general use and frequency of use measures. Social media addiction and disorder differ significantly from “frequent” or “everyday” use. The Multi-dimensional Facebook Intensity Scale (MFIS or BFI; Orosz et al., 2016) was conceptualized to evaluate dimensions of everyday media use and expand upon unidimensional scales. Specifically, Orosz and colleagues (2016) conceptualized intensity as the level of involvement in everyday Facebook use, including persistence, boredom, overuse, and self-expression. The Motivations for Electronic Use (Nesi & Prinstein, 2015) examines reasons for social media use. Harmon and colleagues (2021) later validated this scale within college student populations, deriving five factors representing different motivations for engaging online: Sexual Health, Feedback Seeking, Social Comparison, Emotion Regulation, and Romantic Connection. The Social Media Use Integration Scale (Jenkins-Guarnieri et al., 2013) measures the integration of the social behavior and daily routines of social media users, as well as the importance of and emotional connection to such use. Associations between SMCSE and social media usage intensity, frequency, integration, and motivations would be evidence of convergent and predictive validity.

In addition, SMCSE should be distinct from one’s level of global self-esteem as evidence of discriminant validity. However, high contingent self-esteem comes with the cost of less fulfillment or greater frustration of basic psychological needs for autonomy, competence, and relatedness (Crocker & Park, 2004; Masur et al., 2014; Ryan & Deci, 2018). Further, one’s passion for activities in that domain would be more likely to be obsessive, outcome-driven, and dominating of one’s time rather than in harmony and integrated with one’s other activities and interests.

Methods

Preregistration and Power Analysis

Hypotheses and the data analysis plan for Study 2 were preregistered [here](#). An a priori power analysis conducted in G*Power v3.1.9.7 indicated that 168 participants were necessary to detect a Pearson correlation of .25 using an alpha of .05 with .95 power. Thus, we planned to recruit at least 250 to account for attrition and failed check questions.

Participants and Procedure

As in Study 1, participants were recruited from undergraduate participation pools, were over 18 years old, and were social media users. Responses were collected between October and November 2021, and participants were given course credit in exchange for participation. The average age was 20.91 years old ($SD = 3.29$), with 80.87% identifying as female (16.52% male; 2.61% other). Instagram was the most popular site used by participants (89.13%), followed by Snapchat (81.30%), TikTok (72.6%), Twitter (63%), Facebook (45.2%), and Reddit (25.6%). Participants wrote in “other” social media (7%), including Discord, YouTube, Pinterest, Weibo, and GroupMe.

Those who participated in Study 1 were ineligible to participate in Study 2. Of 271 participants, 230 were retained after passing two of three attention check questions. The University of Houston Institutional Review Board approved methods for Study 2 before data collection.

Measures

Social Media Contingent Self-Esteem Scale. The 8-item version of the SMCSE scale was used on a 7-point scale ($\alpha = .95$, $\omega = .96$). For those interested, Table 2 provides factor loadings from both exploratory and confirmatory factor analyses on the eight items used in this sample. The EFA clearly indicated a single factor accounting for 99% of the variance. The CFA yielded fit statistics similar to those in Study 1: $\chi^2(21) = 127.00$, $p < .001$, RMSEA = .148, CFI = .93, TLI = .91, SRMR = .09. RMSEA indicated poor fit, whereas CFI, TLI, and SRMR indicated adequate fit. Factor loadings, item descriptives, and item-total correlations are provided in Table 2.

Contingent Self-Esteem. The 15-item general contingent self-esteem scale (CSE; Kernis & Goldman, 2006) was included. A sample item is *If I get along well with somebody, I feel better about myself overall*. Items were rated on a scale from 1 (*not at all like me*) to 5 (*very much like me*; $\alpha = .83$). Items were averaged to derive a single score.

Social Media Usage. The Social Media Usage Scale was adapted to measure participants' use of social media (Jenkins-Guarnieri et al., 2013) with two factors: social integration/emotional connection (4 items, $\alpha = .79$) and integration into social routines (6 items, $\alpha = .73$). The adaptation was modified for use across all social media, rather than Facebook-specific. Example items include *I would like it if everyone used social media to communicate* and *I enjoy checking my social media accounts*. Responses ranged from 1 (*strongly disagree*) to 5 (*strongly agree*). Each subscale was averaged, deriving two scores representing social integration/emotional connection and integration into social routines.

Table 2. Final Social Media Contingent Self-Esteem Items, Descriptives, and Loadings for Study 2 EFA and CFA.

Item	Descriptives			Factor Loadings	
	M	SD	ITC	EFA	CTA
1. I feel better about myself when I update social media.	2.65	1.61	.77	.79	.70
2. My feelings of self-worth are based on how well things are going in my social media.	2.11	1.36	.75	.76	.71
3. I feel better about myself when I log into social media.	2.39	1.55	.79	.81	.77
4. When my social media activity is going well, I feel better about myself overall.	2.95	1.79	.78	.82	.80
5. I feel better about myself when I contribute to social media.	2.64	1.64	.87	.90	.90
6. I feel better about myself when I share information on social media.	2.51	1.54	.81	.84	.83
7. I feel better about myself when I participate on social media.	2.81	1.70	.86	.89	.90
8. I feel better about myself when I use social media.	2.86	1.66	.77	.80	.78

Note. $N = 230$. M = Mean; SD = Standard Deviation; ITC = Item-Total Correlation; EFA = Exploratory Factor Analysis; CFA = Confirmatory Factor Analysis. Internal reliability yielded a Cronbach's alpha of .95 and McDonald's omega of .96.

Contingencies of Self-Worth. Three subscales of the Contingencies of Self-Worth Scale measured contingent self-worth for approval, family, and appearance (Crocker & Wolfe, 2001). Five items from 1 (*strongly disagree*) to 7 (*strongly agree*) for each subscale measured approval contingent self-worth (e.g., *I can't respect myself if others don't respect me*; $\alpha = .82$), family contingent self-worth (e.g., *when I don't feel loved by my family, my self-esteem goes down*; $\alpha = .79$), and appearance contingent self-worth (e.g., *my self-esteem is influenced by how attractive I think my face or facial features are*; $\alpha = .79$). Each subscale was averaged to derive a score representing participant contingent self-worth for approval, family, and appearance.

Social Media Addiction. The Facebook Addiction Scale (Andreassen et al., 2012) was modified to assess social media addiction. The root was *How often in the last year have you...*, followed by six items (e.g., *...spent a lot of time thinking about social media or planned use of social media?*). Answers ranged from 1 (*very rarely*) to 5 (*very often*; $\alpha = .84$).

Self-Esteem. The 10-item Rosenberg Self-Esteem Scale (Rosenberg, 1965) measured global level of self-esteem, e.g., *I feel that I'm a person of worth, at least on an equal plane with others*. Answers ranged from 1 (*strongly disagree*) to 7 (*strongly agree*; $\alpha = .91$). Items were averaged such that higher scores indicate greater (more positive) self-esteem. Items 2, 5, 6, 8, and 9 were reverse scored.

Basic Psychological Need Satisfaction and Frustration. Needs satisfaction and frustration were assessed using the Basic Psychological Needs Satisfaction and Frustration scale (Chen et al., 2015). The scale contains 24 items measuring six subscales ($\alpha = .77-.90$). Participants rated how true statements were for them on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Items include *I feel confident that I can do things well, I feel my choices express who I really am*, and *I feel the relationships I have are just superficial* to measure competence satisfaction, autonomy satisfaction, and relatedness frustration, respectively. The mean was taken for each subscale, deriving six scores representing autonomy satisfaction, autonomy frustration, relatedness satisfaction, relatedness frustration, competence satisfaction, and competence frustration.

Facebook Intensity. A modified Multi-dimensional Facebook Intensity Scale (MFIS: Orosz et al., 2016) assessed the intensity of social media use. Thirteen items from 1 (*strongly disagree*) to 5 (*strongly agree*) measured persistence (*I feel bad if I don't check my social media daily*), boredom (*If I'm bored, I open social media*), overuse (*I spend more time on social media than I would like to*), and self-expression (*I like refining my social media profile*). Each subscale contains three items except for persistence (4 items; $\alpha = .72-.91$). Each subscale was averaged with higher scores indicating greater endorsement of persistency, boredom, overuse, and self-expression.

Frequency of Social Media Use. *How often do you use social media daily?* was asked with options 0 (*never*), 1 (*less than once a day*), 2 (*1–2 times/day*), 3 (*3–5 times/day*), 4 (*6–10 times/day*), 5 (*11–20 times/day*), 6 (*21–40 times/day*), 7 (*more than 40 times a day*).

Harmonious and Obsessive Passion Scales. Passion was measured with the Passion Scale (Vallerand et al., 2003), a 12-item scale with two 6-item subscales for obsessive and harmonious passion. Participants responded to the prompt, *While thinking of using social media, please indicate your level of agreement with each item*. Answers ranged from 1 (*strongly disagree*) to 7 (*strongly agree*). Harmonious passion items (e.g., *This activity reflects the qualities I like about myself*; $\alpha = .85$), and obsessive passion items (e.g., *I have difficulties controlling my urge to do my activity*; $\alpha = .90$) were each averaged, deriving two scores. Higher scores indicate more obsessive or harmonious passion while thinking of social media.

Identity Bubble Reinforcement. The Identity Bubble Reinforcement Scale (IBRS; Kaakinen et al., 2020) measures one's endorsement of being in a social media echo chamber. The scale contains 9 items rated from 1 (*does not describe me*) to 10 (*describes me completely*). Example items are *In social media, I belong to a community or communities that I'm proud of*, and *In social media, I feel that people think like me* ($\alpha = .89$). Scale items were averaged with higher scores indicating being within an echo chamber to a greater extent.

Motivations for Electronic Interaction and Use. To assess motivations for social media, we used three subscales of the Motivations for Electronic Interactions Scale (Harmon et al., 2021; Nesi & Prinstein, 2015). These subscales include feedback seeking ($\alpha = .91$), social comparison ($\alpha = .89$), and emotional regulation ($\alpha = .75$). Participants responded with 1 (*not at all true*), 2 (*A little bit true*), 3 (*somewhat true*), 4 (*very true*), and 5 (*extremely true*). Sample items for subscales are *To see what others think about the things I send/post*, *To compare my life with other people's lives*, and *To ask my friends how they are doing*, respectively. Each subscale was averaged, with higher scores representing greater motivation to use social media for feedback seeking, social comparison, and emotional regulation.

Results and Discussion

Skewness (0.67) and kurtosis (-0.064) indicated normal distribution of the SMCSE scale and IQR was 2.25 (1.375–3.625). Pearson product correlations were computed between SMCSE and (a) other measures of contingent self-esteem, (b) basic psychological needs satisfaction and frustration, and obsessive and harmonious passion, and (c) measures of social media use, motives, and addiction. Due to the number of statistical tests, p -values $< .01$ were considered statistically significant and p -values between $.05$ – $.01$ were interpreted with caution. Table 3 provides the means, standard deviations, and correlations between SMCSE, other domains of contingent self-esteem, and global self-esteem. Of these, all were significantly correlated in the expected directions with SMCSE, except global self-esteem. Thus, being higher in SMCSE was related to greater general contingent self-esteem and contingent self-worth regarding others' approval, one's family, and one's appearance. SMCSE was not significantly related to global level of self-esteem, as evidence of discriminant validity.

Measures of contingent self-esteem in other domains generally tend to be negatively associated with the level of self-esteem. The usual explanation for this negative association is that, over time, the declines in self-esteem that one experiences from failures in the contingent domain are more significant than the enhancements in self-esteem that one experiences from successes in the contingent domain (Crocker & Park, 2004). However, this may be less the case in social media, where people tend to cultivate echo chambers or "identity bubbles" (Kaakinen et al., 2020), in which their social networks tend to be similar to themselves. In this case, the enhancements in self-esteem may be relatively equal to the declines in self-esteem.

Next, the means, standard deviations, and correlations between SMCSE, basic psychological needs satisfaction and frustration, and obsessive and harmonious passion are presented in Table 4. SMCSE correlated negatively with competence and relatedness satisfaction and positively with autonomy, competence, and relatedness frustration. Thus, SMCSE was linked to experiencing greater frustration of basic psychological needs for autonomy, competence, and relatedness and to experiencing lower satisfaction of competence and relatedness. Interestingly, SMCSE was not significantly associated with lower satisfaction of autonomy. This may indicate that those whose self-esteem is contingent on the reactions of others on social media can still satisfy their needs for autonomy in other ways.

Table 3. Study 2: Correlations With Other Contingencies of Self-Worth and Global Self-Esteem.

Variable	1	2	3	4	5	6
1. SMCSE	-					
2. Contingent Self-Esteem	.41**	-				
3. CSW—Approval	.35**	.62**	-			
4. CSW—Family	.24**	.35**	.24**	-		
5. CSW—Appearance	.27**	.64**	.57**	.17*	-	
6. Rosenberg Self-Esteem	-.11	-.42**	-.47**	-.03	.38**	-
<i>M</i>	2.64	3.26	3.75	5.07	4.29	4.50
<i>SD</i>	1.37	0.57	1.34	1.22	0.95	1.24

Note. *N* = 229. *M* = Mean; *SD* = Standard Deviation; SMCSE = Social Media Contingent Self-Esteem; CSW = Contingencies of Self-Worth. **p* < .01, ***p* < .001.

Table 4. Study 2: Correlations With Basic Psychological Need Satisfaction, Frustration, and Passion.

Variable	1	2	3	4	5	6	7	8	9
1. SMCSE	-								
2. Autonomy Satisfaction	-.09	-							
3. Autonomy Frustration	.19*	-.34**	-						
4. Relatedness Satisfaction	-.18*	.55**	-.33**	-					
5. Relatedness Frustration	.27**	-.27**	.53**	-.56**	-				
6. Competence Satisfaction	-.15	.66**	-.39**	.64**	-.43**	-			
7. Competence Frustration	.25**	-.39**	.64**	-.43**	.59**	-.64**	-		
8. Obsessive Passion	.51**	-.18*	.37**	-.31**	.39**	-.26**	.43**	-	
9. Harmonious Passion	.45**	.16	.06	.03	.15	.03	.17*	.48**	-
<i>M</i>	2.63	3.55	2.81	3.94	2.24	3.58	2.82	2.61	3.72
<i>SD</i>	1.37	0.83	0.91	0.85	0.92	0.87	1.04	1.30	1.98

Note. *N* = 230; *M* = Mean; *SD* = Standard Deviation; SMCSE = Social Media Contingent Self-Esteem. **p* < .01, ***p* < .001.

Research on harmonious and obsessive passion (Vallerand et al., 2003) has argued that harmonious passion reflects a sense of volition, purposefulness, and control over one's interests. In contrast, obsessive passion reflects passion that dominates a person's self-control, resulting in psychological dependence. These passions can lead to diverging effects on psychological well-being, with harmonious passion facilitating positive emotion and well-being, whereas obsessive passion facilitates negative emotion and well-being. Interestingly, SMCSE was positively correlated with both obsessive and harmonious passion. In this way, SMCSE reflects a greater passion for social media activity overall.

In addition, correlations between SMCSE and social media use, motives, and addiction means, standard deviations, and correlations are presented in Table 5. All associations with SMCSE were significant and in the expected direction. SMCSE was associated with greater frequency and intensity of social media use and a greater likelihood of social media addiction, supporting convergent and predictive validity. SMCSE was also associated with having stronger echo chambers or identity bubbles in one's social media networks, such that those higher in SMCSE were more likely to have social media circles of others who share their identities, beliefs, and opinions. Lastly, SMCSE was associated with using social media more for feedback-seeking, social comparison, and emotion regulation motives, which could suggest that those higher in SMCSE use social media in an attempt to protect or enhance their self-image. Such attempts may not be fruitful, as suggested by the nonsignificant correlation with global self-worth mentioned earlier.

Table 5. Study 2: Correlations With Social Media Addiction, Intensity, and Use.

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. SMCSE	-													
2. Addiction	.55**	-												
3. Int. Persistence	.50**	.61**	-											
4. Int. Boredom	.25**	.38**	.53**	-										
5. Int. Overuse	.36**	.70**	.59**	.51**	-									
6. Int. Self-Expression	.53**	.34**	.38**	.13	.31**	-								
7. Identity Bubble	.40**	.21*	.35**	.30**	.21*	.24**	-							
8. SMUIS 1	-.40**	-.35*	-.41**	-.30**	-.28**	-.24**	-.35**	-						
9. SMUIS 2	-.28**	-.30*	-.35**	-.39**	-.27**	-.10	-.28**	.41**	-					
10. MEIS 2	.65**	.43*	.41**	.22**	.30**	.53**	.28**	-.35**	-.24**	-				
11. MEIS 3	.45**	.43*	.38**	.23**	.37**	.40**	.14	-.27**	-.13	.62**	-			
12. MEIS 4	.28**	.37*	.35**	.25**	.26**	.25**	.25**	-.38**	-.25**	.27**	.37**	-		
13. Frequency	.37**	.49*	.54**	.38**	.50**	.29**	.25**	-.37**	-.42**	.35**	.39**	.26**	-	
14. RSE	-.11	-.33**	-.26**	-.18*	-.31**	-.08	-.02	.11	-.02	-.23*	-.30**	-.17*	-.22**	-
<i>M</i>	2.61	2.65	2.89	4.09	3.24	2.09	5.58	3.31	2.37	2.31	2.23	3.10	4.35	4.50
<i>SD</i>	1.35	0.92	0.95	0.96	1.14	0.98	1.82	0.85	0.88	1.03	1.00	0.85	1.37	1.24

Note. *N* = 230. *M* = Mean; *SD* = Standard Deviation; SMCSE = Social Media Contingent Self-Esteem; Int. = Intensity; SMUIS1, SMUIS2 = Social Media Usage Integration Scale/Emotional Connection and Integration into Social Routines; MEIS 2, MEIS 3, MEIS 4 = Motivations for Electronic Interaction and Use: Feedback Seeking, Social Comparison, Emotion Regulation, respectively. RSE = Rosenberg Self-Esteem. Given the large number of correlations, those with $p > .01$ should be interpreted cautiously. * $p < .01$, ** $p < .001$.

Overall, SMCSE was associated with having higher contingent self-worth in other conceptually-related domains and was largely independent of global self-esteem. SMCSE shared variance with frustration rather than satisfaction of basic psychological needs, and with a strong passion for social media activity. Importantly, SMCSE was related to more frequent and intense social media use, including addiction and stronger identity bubbles in one's social media networks. Together, these elements might facilitate high contingent self-esteem because one's views are consistently validated and reinforced (Kaakinen et al., 2020). However, when the sense of self is contingent, affect received from perceived highs (e.g., receiving supportive comments, positive engagement) and lows (e.g., negative feedback) may be more extreme, relating to more dependent and addictive use. Further exploration of associations between SMCSE, identity bubbles, and social media addiction was the focus of Study 3.

Study 3

When self-esteem is highly contingent on social media, reactions to disapproval and criticism from one's social network should be stronger because these experiences are more likely to invoke one's global sense of self-worth. Thus, cultivating like-minded social networks (identity bubbles) would be more likely when higher in SMCSE, as we saw in Study 2. High SMCSE could reinforce social media addiction because the experience of positive feedback from one's social network can be especially impactful. High echo-chamber reinforcement has been associated with increased social media gaming behavior (Sirola et al., 2021) and conspiracy theory proliferation via social media networks (Dow et al., 2021). Yet, no studies have examined possible associations between echo chamber effects and social media use itself, particularly addiction and disorder symptoms. Further, SMCSE might exacerbate the association between identity-bubble reinforcement and addiction or disorder symptoms.

Study 3, therefore, had three aims. First, this study examined further associations between SMCSE and identity bubble reinforcement (IBR), frequency of use, and each of the social media addiction and disorder criteria, and importantly, tested these associations for SMCSE's unique contribution beyond global self-esteem, for further evidence of convergent and discriminant validity. Second, this study tested hypotheses of SMCSE as a potential moderator of the associations between IBR and social media addiction and disorder. In light of the gap in research mentioned above, associations of IBR with social media addiction and disorder could depend on one's degree of SMCSE. Specifically, IBR could be more strongly associated with addiction and disorder criteria when higher in SMCSE.

Lastly, it was also possible that SMCSE and IBR could be associated with each other such that receiving positive feedback and interacting with like-minded social media users would reinforce higher SMCSE, which would, in turn, be associated with greater addiction/disorder criteria. In order to better understand the relationship between these variables, the third aim was to explore SMCSE as a potential mediator between IBR and measures of social media addiction and disorder, and vice versa. We considered these mediation analyses exploratory because we did not hypothesize them in advance.

Methods

Preregistration

All materials and methods used are available online [here](#).

Participants and Procedure

One hundred and ninety-two participants (73.4% female, 20.6% male, 2% other or preferred not to say) were recruited using the same methods as Study 1 and 2 in October and November 2021. Pre-screen criteria and attention checks were the same as well. The mean age was 19.85 ($SD = 1.59$). Instagram was the most popular social media site (93.8%), followed by Snapchat (84.4%), TikTok (66.1%), Twitter/X (61.5%), Facebook (55.7%), and Reddit (26.6%). Participants also listed other media sites, including Discord, Pinterest, YouTube, WhatsApp, XenForo, and Tumblr.

We recruited 254 respondents, of which 62 failed attention check questions, retaining 192 responses. The University of Houston Institutional Review Board approved this study before data collection.

Measures

Identity Bubble Reinforcement ($\alpha = .87$), Social Media Addiction ($\alpha = .83$), Rosenberg Self-Esteem ($\alpha = .91$), and Frequency of Social Media Use were assessed as in Study 2.

Social Media Contingent Self-Esteem. The 8-item SMCSE Scale described in previous studies was used on a scale from 1 (*not at all like me*) to 5 (*very much like me*; $\alpha = .92$).

Social Media Disorder. The Social Media Disorder Scale (Van den Eijnden et al., 2016) uses nine items capturing various addictive behaviors (e.g., preoccupation, tolerance, withdrawal). For example, *During the past year, have you...regularly neglected other activities (e.g., hobby, sport) because you wanted to use social media?* Participants answered Yes = 1 or No = 0 ($\alpha = .75$). Answers were averaged with higher scores reflecting greater social media disorder symptoms.

Self-Declared Social Media Addiction. Participants responded to a single prompt, *To what extent do you feel addicted to social media*, on a scale of 1 (*not at all addicted*) to 5 (*strongly addicted*).

Additional Measures. Basic psychological needs satisfaction and frustration, well-being, and rejection sensitivity measures were included but not analyzed here. Measures can be found [here](#).

Results and Discussion

Post Hoc Power Analysis for Mediation Model

A post hoc power analysis was conducted using the pwr2ppl package in R (Aberson, 2022). This analysis found that with 192 participants, the study was sufficiently powered to analyze SMCSE mediating the relationship between IBR and criteria of social media disorder, social media addiction using the BSMAS, and self-reported addiction. For these analyses, the resulting power was .992, .998, and .965, respectively.

Correlations and Primary Aims

Skewness (0.422) and kurtosis (-0.83) indicated normal distribution; IQR was 1.5 (1.25–2.75). Pearson product correlations were computed between SMCSE, Rosenberg self-esteem, IBR, frequency of social media use, and the social media addiction and disorder variables. Table 6 provides means, standard deviations, and correlations. As shown, SMCSE was associated with greater Rosenberg self-esteem, greater IBR, as well as more frequent social media use, both measures of addiction, and social media disorder.

To examine the first aim, whether these associations between SMCSE and the various criteria remain controlling for Rosenberg self-esteem, a series of simultaneous regressions were computed with SMCSE and Rosenberg self-esteem as predictors, and identity bubble reinforcement, frequency of use, and each of the addiction and disorder variables as criteria. Results indicated that controlling for level of Rosenberg self-esteem, SMCSE remained a significant predictor of identity bubble reinforcement, b (unstandardized) = 0.860, $t(189) = 6.47$, $p < .001$, 95% CI [0.598, 1.123], social media use, $b = 0.637$, $t(189) = 5.63$, $p < .001$, 95% CI [0.414, 0.860], the BSMAS, $b = 0.550$, $t(189) = 7.60$, $p < .001$, 95% CI [0.407, 0.692], self-reported addiction, $b = 0.472$, $t(189) = 4.68$, $p < .001$, 95% CI [0.273, 0.671], and social media disorder, $b = 0.094$, $t(189) = 5.59$, 95% CI [0.061, 0.127]. Thus, the first aim was supported, providing further evidence of convergent validity. Further, SMCSE demonstrated predictive utility in associating with all criteria of interest beyond the contribution of RSE.

To test the second aim of SMCSE as a potential moderator of the associations between IBR and social media addiction and disorder, a series of moderated general linear models were computed with IBR, SMC, and their product as predictors of each criterion. SMCSE significantly moderated the association between identity bubble reinforcement and self-reported addiction, $t(188) = -2.14$, $p = .034$, $pr = -.15$, 95% CI [0.00, 0.0809], but the direction was opposite of what was expected. The association between identity bubble reinforcement and self-reported addiction was negative and not significant at high (+1 SD) SMCSE, $t(188) = -0.56$, $p = .576$, 95% CI [-0.207, 0.116], and positive and significant at low (-1 SD) SMCSE, $t(188) = 2.50$, $p = .013$, 95% CI [0.036, 0.309]. SMCSE did not significantly moderate the association between mean-centered identity bubble reinforcement and social media disorder, $t(189) = -1.60$, $p = .111$, nor Bergen Social Media Addiction, $t(189) = -1.55$, $p = .122$, 95% CI [-0.149, 0.019].

Table 6. Study 3: Correlations With Social Media Use, Addiction, and Disorder.

Variable	1	2	3	4	5	6	7
1. SMCSE	-						
2. RSE	.30*	-					
3. Identity Bubble	.44**	.11	-				
4. Frequency of Use	.42**	.23*	.22*	-			
5. BSMA	.54**	.37**	.36**	.52**	-		
6. Self-Declared Addiction	.38**	.27*	.26*	.59**	.63**	-	
7. Social Media Disorder	.43**	.28**	.22*	.52**	.63**	.60**	-
<i>M</i>	2.08	2.09	5.78	4.94	2.72	2.82	1.98
<i>SD</i>	0.88	0.60	1.71	1.46	1.03	1.28	1.97

Note. $N = 192$. M = Mean; SD = Standard Deviation; SMCSE = Social Media Contingent Self-Esteem; RSE = Rosenberg Self-Esteem. SMCSE was administered on a 5-point scale in this study, whereas it was on a 7-point scale in Studies 1 and 2. * $p < .01$, ** $p < .001$.

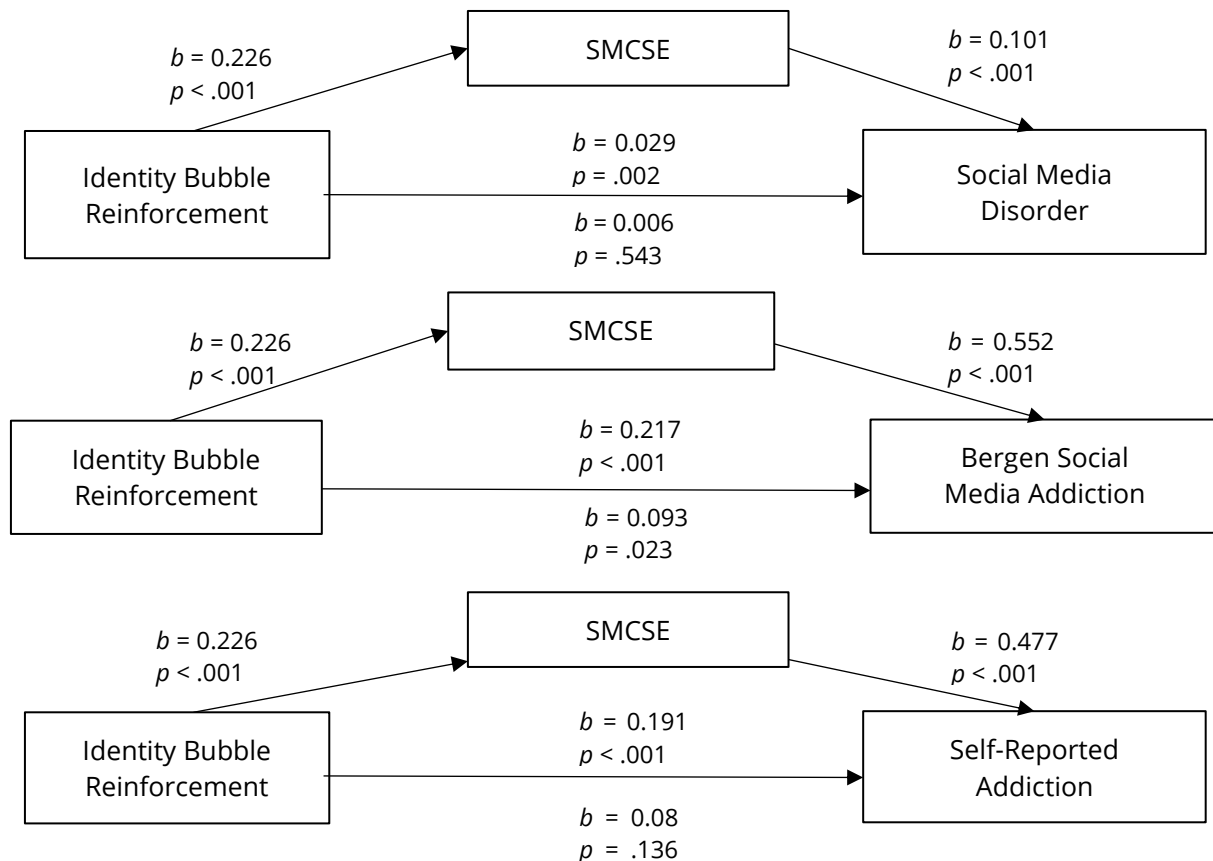
Exploratory Mediation Models

To examine the third aim, a series of PROCESS analyses were computed to test SMCSE as a mediator of the association between identity bubble reinforcement and each of the three addiction and disorder criteria. Mediation models were estimated using SAS PROCESS (Model 4; Hayes, 2012). When SMCSE was tested as a mediator between identity bubble reinforcement and each of the three addiction and disorder criteria, all three models supported SMCSE as a significant mediator. Figure 1 shows path models for the three addiction and disorder criteria. When social media disorder was the criterion, identity bubble reinforcement predicted greater SMCSE, $b = 0.223$, $SE = 0.034$, $p < .001$. In turn, SMCSE predicted greater social media disorder, $b = 0.101$, $SE = 0.018$, $p < .001$. Further, the indirect effect of identity bubble reinforcement through SMCSE was significant, $b = 0.02$, $Z = 4.27$, $SE = 0.005$, 95% bias-corrected bootstrapped CI [0.012, 0.036]. When the BSMAS was the criterion, identity bubble reinforcement predicted greater SMCSE, $b = 0.223$, $SE = 0.034$, $p < .001$. In turn, SMCSE predicted greater social media addiction, $b = 0.552$, $SE = 0.078$, $p < .001$. Further, the indirect effect of identity bubble reinforcement through SMCSE was significant, $b = 0.12$, $Z = 4.83$, $SE = 0.026$, 95% bias-corrected bootstrapped CI [0.076, 0.179]. Finally, when self-reported addiction was the criterion, identity bubble reinforcement predicted greater SMCSE, $b = 0.223$, $SE = 0.034$, $p < .001$. In turn, SMCSE predicted greater self-reported addiction, $b = 0.477$, $SE = 0.108$, $p < .001$. Further, the indirect effect of identity bubble reinforcement through SMCSE was significant, $b = 0.108$, $Z = 3.66$, $SE = 0.029$, 95% bias-corrected bootstrapped CI [0.053, 0.169]. Thus, results were consistent with SMCSE as a mediator between identity bubble reinforcement and all three addiction and disorder criteria.

Mediation models were also tested with identity bubble reinforcement as a mediator between SMCSE and each of the three addiction and disorder criteria. One model supported identity bubble reinforcement as a significant mediator. Specifically, SMCSE predicted greater identity bubble reinforcement, $b = 0.85$, $SE = 0.126$, $p < .001$, which in turn predicted greater Bergen Social Media Addiction, $b = 0.09$, $SE = 0.040$, $p = .023$, yielding a significant indirect effect, $b = 0.08$, $Z = 2.15$, $SE = 0.037$, 95% bias-corrected bootstrapped CI [0.005, 0.163]. With only one of three addiction and disorder criteria indicating significant mediation by identity bubble reinforcement, we suggest caution in interpreting and generalizing support for this alternative direction.

Overall, support emerged for SMCSE when examined as a mediator between identity bubble reinforcement and all three addiction and disorder criteria. However, when identity bubble reinforcement was tested as the mediator between SMCSE and addiction, disorder, and self-reported addiction, only the model testing Bergen's measure of social media addiction was significant. Thus, results suggest more consistent support for the role of SMCSE in how having echo chambers in one's social media networks predicts social media addiction and disorder, partly because like-minded social media circles tend to support social media contingent self-esteem, which further predicts addiction and disorder.

Figure 1. Mediation Models for Social Media Disorder, Bergen Social Media Addiction, and Self-Reported Addiction.



Note. The number above the path from identity bubble reinforcement to each addiction criterion represents the total effect; the number below represents the direct effect, which controls for SMCSE. SMCSE = social media contingent self-esteem.

General Discussion

Individuals vary in the degree to which their self-esteem is contingent on social media, which has implications for those more likely to experience social media addiction. SMCSE is grounded in theoretical frameworks on the authenticity of self, basic psychological needs, and the dynamics of self-esteem contingencies (Crocker & Park, 2004; Hodgins & Knee, 2002; Kernis & Goldman, 2006; Ryan & Deci, 2018). Across three studies, this research derived the construct of SMCSE and examined its association with general contingent self-esteem, contingent self-esteem in other domains, basic psychological needs satisfaction and frustration, and various social media use experiences, motives, and multiple measures evaluating social media addiction and disorder criteria.

SMCSE correlated with contingent self-esteem in conceptually related domains and was a strong predictor of frequent and intense social media use, as well as addiction and disorder criteria. Higher SMCSE was moderately associated with general contingent and contingent self-esteem in conceptually related domains, providing evidence of convergent validity. Interestingly, SMCSE itself was not significantly associated with global level of self-esteem, providing evidence of discriminant validity. Study 2 also found evidence that SMCSE was associated with greater frustration and less satisfaction of basic psychological needs for autonomy, competence, and relatedness. These findings are consistent with self-determination theory, which has postulated that optimal psychological well-being emerges through the satisfaction of fundamental psychological needs and lower levels of contingent self-esteem (Deci & Ryan, 2000; Ryan & Deci, 2018). Indeed, social media users who are lower in SMCSE would be less reliant on and affected by fluctuations in affirmation and feedback from social media use. In turn, they would be less subject to declines in self-worth from social media experiences. On the other hand, higher SMCSE was linked to both stronger harmonious and obsessive passion, suggesting that it reflects greater passion for social media overall. Studies have suggested that those with greater obsessive passion within a domain are more susceptible to negative affect from rejection and ostracism (e.g., Vallerand et al., 2003).

SMCSE was also linked to greater frequency and intensity of social media use and social media addiction. In this way, when higher in SMCSE, people use social media more frequently and with greater intensity, persistence, and

overuse for reasons of self-expression and boredom. These associations suggest that SMCSE can be useful for predicting a range of social media behaviors, and not just problematic, disordered, or addictive use as measured by the Bergen Social Media Addiction Scale and the Social Media Disorder Scale. Evidence also emerged for an affinity for social media echo chambers. SMCSE was associated with having identity bubbles in one's social media networks, such that those higher in SMCSE were more likely to interact with others sharing similar identities, beliefs, and opinions. Feedback within these echo chambers, or identity bubbles, is likely to reinforce existing beliefs, attitudes, and opinions, possibly protecting those higher in SMCSE from experiencing negative evaluations, although also making them especially susceptible to criticism. This may partly explain why both positive and negative affect were associated with social media use, and why social media use was also associated with well-being, life satisfaction, and other psychological outcomes to varying degrees (Orben & Przybylski, 2019a; Orben et al., 2019). Finally, Study 2 found associations between higher SMCSE and greater tendencies to use social media for feedback-seeking, social comparison, and emotion regulation motives, all of which support the notion that those higher in SMCSE seek to avoid negative social media evaluations even more strongly than the norm to protect themselves from possible fluctuations.

Study 3 examined the predictive utility of SMCSE compared to Rosenberg's self-esteem scale, a widely used measurement of global self-esteem. Associations between SMCSE and identity bubble reinforcement, social media use, and criteria for addiction and disorder remained significant, controlling for global level of self-esteem, indicating that SMCSE uniquely predicted addiction and disorder in the social media domain beyond global self-esteem. Potential moderation and mediation models were examined as well. Specifically, we tested whether SMCSE moderated the strength of association between identity bubble reinforcement and social media addiction and disorder, such that having echo chambers on social media may more strongly predict addiction and disorder. Support for moderation emerged for only one of three criteria, self-reported addiction, and in the reverse direction of the prediction, indicating that high identity bubble reinforcement was more positively associated with self-reported addiction when social media contingent self-esteem low. One possible explanation could be that immersion within social media sites with higher volumes of like-minded users made individuals feel as though they were addicted to its use even when they, in reality, were not contingent on it for self-esteem. However, given that only one of the three criteria revealed significant moderation, we suggest caution in interpreting this result.

We also explored potential mediation in which SMCSE served as a mediator between identity bubble reinforcement and the addiction and disorder criteria, as well as the reverse models. Though speculative and exploratory (Rohrer, 2018), consistent evidence emerged across criteria for supporting SMCSE as a mediator on the relationship between identity bubble reinforcement and addiction and disorder criteria assessed by self-reported addiction, the Bergen Social Media Addiction Scale and the Social Media Disorder Scale. Although merely suggestive, results from the mediation models make good sense. The validation and rejection inherent within social media identity bubbles potentially reinforce contingent self-esteem, as one feels especially attuned to likes, dislikes, or otherwise supportive and critical interactions (Koivula et al., 2019), and contingent self-appraisals (Burrow & Rainone, 2017). When such users continue interacting with a like-minded social network, it may become even more rewarding and desirable, despite the risk of critical judgments and upward social comparisons (Shakya et al., 2017; Vogel et al., 2014). Continuous reinforcement of a behavior or activity may be particularly strong for those already at risk due to individual differences such as contingent self-esteem or high need for belongingness. Similar patterns have been demonstrated regarding online gambling addiction and the gambling community, such that continuous reinforcement of behavior via online interactions was linked to gambling disorder (Sirola et al., 2021). Further, this association was consistent across three problematic social media use assessments. Given the lack of consensus regarding the pathology and diagnostic criteria of disordered or addictive social media use (see Fournier et al., 2023), we adopted a multi-faceted approach to targeting problematic social media use to examine the range of SMCSE's utility.

Limitations and Future Directions

The present research has limitations. First, the studies employed nonexperimental, cross-sectional survey designs, preventing causal inferences (Maxwell & Cole, 2007; Rohrer, 2018). Longitudinal designs, including within-person daily diary assessments of social media use, would provide better evidence of directionality and help to rule out potential between-person third variables. A second limitation is the generalizability of these findings beyond samples of mostly undergraduate women who participated for course credit. However, research has shown that young, highly educated women have a disproportionately high presence on social media and are more likely to

engage in more active use, including posting “selfies”, for example (Anderson & Perrin, 2017; Yu et al., 2018). Indeed, young adult populations constitute a large proportion of social media use, with 84% of adults aged between 18 and 29 active on social media (Auxier & Anderson, 2021). Social media addiction prevalence is highest for this group compared to other demographics (Statista, 2023). This prevalence is also anticipated to increase with younger populations (Vogels & Gelles-Watnick, 2023). Lastly, these data were collected during the COVID-19 pandemic, which may limit their generalizability to non-pandemic timelines. With that acknowledged, problematic social media use has continued to increase even after the Centers for Disease Control no longer declared COVID-19 a health emergency. We hesitate to speculate further on potential effects of the pandemic on our findings without comparative data.

Across the three samples ($n = 822$), racial and ethnic identities were also diverse with the majority of the sample identifying as an ethnic minority. Nonetheless, social media use in other populations varying in age, gender, and other interpersonal characteristics might help delineate effects (Twenge et al., 2020). It is also important to acknowledge that this research does not imply that social media use per se has generally negative consequences. On the contrary, these findings clarify that social media disorder and addiction may be more prevalent for individuals who derive their self-esteem from social media use. In Study 3, suggestive evidence emerged that identity bubbles (echo chambers in one’s social network) may contribute to SMCSE, and that this kind of self-esteem, in turn, predicts greater likelihood of social media addiction and disorder.

Finally, SMCSE was operationalized at the level of “social media”, including more generalized experiences and tendencies across various social media platforms. Social media encapsulates many interactions in today’s technological environment, including likes and comments, active contributions (i.e., video and content sharing), profile updates, and direct messaging with specific users. Such effects might even be relevant to specific social media platforms and the ever-changing updates made to these platforms. However, while these differences between platforms are noteworthy for additional examination (Masciantonio et al., 2021), attempts to target specific social media behaviors can present their own issues (Parry et al., 2021). If identified as having theoretically unique and important interaction dynamics and properties, examining divergence across platforms may be one avenue of additional inquiry.

Conclusions

The use and incorporation of social media into daily functioning offers a potential wealth of benefits and deleterious effects depending on the user and their intrapersonal characteristics. While social media addiction has yet to be adopted as a diagnosable disorder, this set of studies sought to better understand this phenomenon via a novel measure of contingent self-esteem, and consistent evidence emerged of SMCSE’s utility. These studies also support SMCSE as an intrapersonal characteristic that may play a mediating role in the link between validation from echo chambers and subsequent addiction and disorder symptomology.

Footnotes

¹ Due to an error in planning, the 20 participant per item statement was not maintained when splitting the data into one sample for EFA and one sample for CFA. We incorrectly thought that the target sample was in reference to the total sample. We also computed the EFA on the total sample ($n_{\text{total}} = 412$), which yielded a nearly identical solution and pattern of rotated factor loadings and secondary loadings as those reported in Table 1 for the pre-registered split-sample EFA ($n = 189$). We have added a Table in the supplementary materials that reports results of this total sample analysis.

Conflict of Interest

The authors have no conflicts of interest to declare.

Authors’ Contribution

Anjelica Martinez: conceptualization, methodology, formal analysis, writing—original draft. **Lindsay J. Browne:** analysis, software, visualization. **C. Raymond Knee:** writing—original draft, supervision.

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References

- Aberson, C., Rodriguez, J. E., & Siegel, D. (2022). Power analysis for regression coefficients: The role of multiple predictors and power to detect all coefficients simultaneously. *The Quantitative Methods for Psychology, 18*, 142–151. <https://doi.org/10.20982/tqmp.18.2.p142>
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). <https://doi.org/10.1176/appi.books.9780890425596>
- Anderson, M., & Perrin, A. (2017). *Technology use among seniors*. Pew Research Center for Internet & Technology. <https://www.pewresearch.org/internet/2017/05/17/technology-use-among-seniors/>
- Andreassen, C. S., Pallesen, S., & Griffiths, M. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behavior, 64*, 287–293. <https://doi.org/10.1016/j.addbeh.2016.03.006>
- Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook Addiction Scale. *Psychological Reports, 110*(2), 501–517. <https://doi.org/10.2466/02.09.18.PR0.110.2.501-517>
- Auxier, B., & Anderson, M. (2021, April 7). *Social media use in 2021*. Pew Research Center. <https://www.pewresearch.org/internet/2021/04/07/social-media-use-in-2021/>
- Baker, D. A., & Algorta, G. P. (2016). The relationship between online social networking and depression: A systematic review of quantitative studies. *Cyberpsychology, Behavior, and Social Networking, 19*(11), 638–648. <https://doi.org/10.1089/cyber.2016.0206>
- Burrow, A. L., & Rainone, N. (2017). How many likes did I get?: Purpose moderates links between positive social media feedback and self-esteem. *Journal of Experimental Social Psychology, 69*, 232–236. <https://doi.org/10.1016/j.jesp.2016.09.005>
- Burns, K. E., Duffett, M., Kho, M. E., Meade, M. O., Adhikari, N. K., Sinuff, T., & Cook, D. J. (2008). A guide for the design and conduct of self-administered surveys of clinicians. *CMAJ, 179*(3), 245–252. <https://doi.org/10.1503/cmaj.080372>
- Cambron, M. J., Acitelli, L. K., & Steinberg, L. (2010). When friends make you blue: The role of friendship contingent self-esteem in predicting self-esteem and depressive symptoms. *Personality and Social Psychology Bulletin, 36*(3), 384–397. <https://doi.org/10.1177/01461672093515>
- Carr, C. T. (2021). *Computer-mediated communication: A theoretical and practical introduction to online human communication*. Rowman & Littlefield. <https://rowman.com/ISBN/9781538131725/Computer-Mediated-Communication-A-Theoretical-and-Practical-Introduction-to-Online-Human-Communication>
- Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., der Kaap-Deeder, V., Duriez, B., Lens, W., Matos, L., Mouratidis, A., Ryan, R. M., Sheldon, K. M., Soenens, B., Van Petegem, S., & Verstuyf, J. (2015). Basic psychological need satisfaction, need frustration, and need strength across four cultures. *Motivation and Emotion, 39*(2), 216–236. <https://doi.org/10.1007/s11031-014-9450-1>
- Cheng, C., Lau, Y. C., Chan, L., & Luk, J. W. (2021). Prevalence of social media addiction across 32 nations: Meta-analysis with subgroup analysis of classification schemes and cultural values. *Addictive Behaviors, 117*, Article 106845. <https://doi.org/10.1016/j.addbeh.2021.106845>
- Cingel, D. P., Carter, M. C., & Krause, H.-V. (2022). Social media and self-esteem. *Current Opinion in Psychology, 45*, Article 101304. <https://doi.org/10.1016/j.copsyc.2022.101304>
- Crocker, J., Karpinski, A., Quinn, D. M., & Chase, S. K. (2003). When grades determine self-worth: Consequences of contingent self-worth for male and female engineering and psychology majors. *Journal of Personality and Social Psychology, 85*(3), 507–516. <https://doi.org/10.1037/0022-3514.85.3.507>

- Crocker, J., & Park, L. E. (2004). The costly pursuit of self-esteem. *Psychological Bulletin*, 130(3), 392–414. <https://doi.org/10.1037/0033-2909.130.3.392>
- Crocker, J., & Wolfe, C. T. (2001). Contingencies of self-worth. *Psychological Review*, 108(3), 593–623. <https://doi.org/10.1037/0033-295X.108.3.593>
- Deci, E. L., & Ryan, R. M. (1995). Human autonomy: The basis for true self-esteem. In M. H. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp. 31–49). Plenum Press. <https://psycnet.apa.org/record/1995-97476-002>
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
- Dhir, A., Yossatorn, Y., Kaur, P., & Chen, S. (2018). Online social media fatigue and psychological well-being—A study of compulsive use, fear of missing out, fatigue, anxiety and depression. *International Journal of Information Management*, 40, 141–152. <https://doi.org/10.1016/j.ijinfomgt.2018.01.012>
- Dow, B. J., Johnson, A. L., Wang, C. S., Whitson, J., & Menon, T. (2021). The COVID-19 pandemic and the search for structure: Social media and conspiracy theories. *Social and Personality Compass*, 15(9), Article e12636. <https://doi.org/10.1111/spc3.12636>
- Elhai, J. D., Levine, J. C., Alghraibeh, A. M., Alafnan, A. A., Aldraiweesh, A. A., & Hall, B. J. (2018). Fear of missing out: Testing relationships with negative affectivity, online social engagement, and problematic smartphone use. *Computers in Human Behavior*, 89, 289–298. <https://doi.org/10.1016/j.chb.2018.08.020>
- 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(4), 1143–1168. <https://doi.org/10.1111/j.1083-6101.2007.00367.x>
- Faelens, L., Hoorelbeke, K., Soenens, B., Van Gaeveren, K., De Marez, L., De Raedt, R., & Koster, E. H. (2021). Social media use and well-being: A prospective experience-sampling study. *Computers in Human Behavior*, 114, Article 106510. <https://doi.org/10.1016/j.chb.2020.106510>
- Fournier, L., Schimmenti, A., Musetti, A., Boursier, V., Flayelle, M., Cataldo, I., Starcevic, V., & Billieux, J. (2023). Deconstructing the components model of addiction: An illustration through “addictive” use of social media. *Addictive Behaviors*, 143(2023), Article 107694. <https://doi.org/10.1016/j.addbeh.2023.107694>
- Gilmour, J., Machin, T., Brownlow, C., & Jeffries, C. (2020). Facebook-based social support and health: A systematic review. *Psychology of Popular Media*, 9(3), 328–346. <https://doi.org/10.1037/ppm0000246>
- Gomez, M., Klare, D., Ceballos, N., Dailey, S., Kaiser, S., & Howard, K. (2021). Do you dare to compare?: The key characteristics of social media users who frequently make online upward social comparisons. *International Journal of Human-Computer Interaction*, 38(10), 938–948. <https://doi.org/10.1080/10447318.2021.1976510>
- Griffiths, M. D. (2010). The role of context in online gaming excess and addiction: Some case study evidence. *International Journal of Mental Health and Addiction*, 8, 119–125. <https://doi.org/10.1007/s11469-009-9229-x>
- Harmon, J., Boland, J., & Venta, A. (2021). Further validation of the Motivations for Electronic Interaction Scale. *Current Psychology*, 41, 7588–7594. <https://doi.org/10.1007/s12144-020-01300-3>
- Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling.
- Hodgins, H. S., & Knee, C. R. (2002). The integrating self and conscious experience. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 87–100). University of Rochester Press. <https://psycnet.apa.org/record/2002-01702-004>
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Huang, C. (2017). Time spent on social network sites and psychological well-being: A meta-analysis. *Cyberpsychology, Behavior, and Social Networking*, 20(6), 346–354. <https://doi.org/10.1089/cyber.2016.0758>
- Jenkins-Guarnieri, M. A., Wright, S. L., & Johnson, B. (2013). Development and validation of a Social Media Use Integration Scale. *Psychology of Popular Media Culture*, 2(1), 38–50. <https://doi.org/10.1037/a0030277>

- Kaakinen, M., Sirola, A., Savolainen, L., & Oksanen, A. (2020). Shared identity and shared information in social media: Development and validation of the Identity Bubble Scale. *Media Psychology, 23*(1), 25–51. <https://doi.org/10.1080/15213269.2018.1544910>
- Kanat-Maymon, Y., Almog, L., Cohen, R., & Amichai-Hamburger, Y. (2018). Contingent self-worth and Facebook addiction. *Computers in Human Behavior, 88*, 227–235. <https://doi.org/10.1016/j.chb.2018.07.011>
- Kemp, S. (2023, January 26). *Digital 2023: Global overview report*. Datareport. <https://datareportal.com/reports/digital-2023-global-overview-report#:~:text=Kepios%20analysis%20reveals%20that%20the,over%20the%20past%203%20years.>
- Kernis, M. H. (2003). Toward a conceptualization of optimal self-esteem. *Psychological Inquiry, 14*(1), 1–26. https://doi.org/10.1207/S15327965PLI1401_01
- Kernis, M. H., & Goldman, B. M. (2006). Assessing stability of self-esteem and contingent self-esteem. In M. H. Kernis (Ed.), *Self-esteem issues and answers: A sourcebook of current perspectives* (pp. 77–85). Psychology Press. <https://psycnet.apa.org/record/2006-12386-010>
- Knee, C. R., Canevello, A., Bush, A. L., & Cook, A. (2008). Relationship-contingent self-esteem and the ups and downs of romantic relationships. *Journal of Personality and Social Psychology, 95*(3), 608–627. <https://doi.org/10.1037/0022-3514.95.3.608>
- Koivula, A., Kaakinen, M., Oksanen, A., & Räsänen, P. (2019). The role of political activity in the formation of online identity bubbles. *Policy & Internet, 11*(4), 396–417. <https://doi.org/10.1002/poi3.211>
- Kross, E., Verduyn, P., Sheppes, G., Costello, C. K., Jonides, J., & Ybarra, O. (2021). Social media and well-being: Pitfalls, progress, and next steps. *Trends in Cognitive Sciences, 25*(1), 55–66. <https://doi.org/10.1016/j.tics.2020.10.005>
- Lee, K.-T., Noh, M.-J., & Koo, D.-M. (2013). Lonely people are no longer lonely on social networking sites: The mediating role of self-disclosure and social support. *Cyberpsychology, Behavior, and Social Networking, 16*(6), 413–418. <https://doi.org/10.1089/cyber.2012.0553>
- Masciantonio, A., Bourguignon, D., Bouchat, P., Balty, M., & Rimé, B. (2021). Don't put all social network sites in one basket: Facebook, Instagram, Twitter, TikTok, and their relations with well-being during the COVID-19 pandemic. *PLoS One, 16*(3), Article e0248384. <https://doi.org/10.1371/journal.pone.0248384>
- Masur, P. K., Reinecke, L., Ziegele, M., & Quiring, O. (2014). The interplay of intrinsic need satisfaction and Facebook specific motives in explaining addictive behavior on Facebook. *Computers in Human Behavior, 39*, 376–386. <https://doi.org/10.1016/j.chb.2014.05.047>
- Maxwell, S. E., & Cole, D. A. (2007). Bias in cross-sectional analyses of longitudinal mediation. *Psychological Methods, 12*(1), 23–44. <https://psycnet.apa.org/doi/10.1037/1082-989X.12.1.23>
- Midgley, C., Thai, S., Lockwood, P., Kovacheff, C., & Page-Gould, E. (2021). When every day is a high school reunion: Social media comparisons and self-esteem. *Journal of Personality and Social Psychology, 121*(2), 285–307. <https://doi.org/10.1037/pspi0000336>
- Mishra, P., Pandey, C. M., Singh, U., Gupta, A., Sahu, C., & Keshri, A. (2019). Descriptive statistics and normality tests for statistical data. *Annals of Cardiac Anaesthesia, 22*(1), 67–72. https://doi.org/10.4103/aca.ACA_157_18
- 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>
- Nesi, J., & Prinstein, M. J. (2015). Using social media for social comparison and feedback-seeking: Gender and popularity moderate associations with depressive symptoms. *Journal of Abnormal Child Psychology, 43*(8), 1427–1438. <https://doi.org/10.1007/s10802-015-0020-0>
- O'Day, E. B., & Heimberg, R. G. (2021). Social media use, social anxiety, and loneliness: A systematic review. *Computers in Human Behavior Reports, 3*, Article 10070. <https://doi.org/10.1016/j.chbr.2021.100070>
- Orben, A., Dienlin, T., & Przybylski, A. K. (2019). Social media's enduring effect on adolescent life satisfaction. *Proceedings of the National Academy of Sciences, 116*(21), 10226–10228. <https://doi.org/10.1073/pnas.1902058116>
- Orben, A., & Przybylski, A. K. (2019a). The association between adolescent well-being and digital technology use. *Nature and Human Behaviour, 3*(2), 173–182. <https://doi.org/10.1038/s41562-018-0506-1>

- Orben, A., & Przybylski, A. K. (2019b). Screens, teens, and psychological well-being: Evidence from three time-use-diary studies. *Psychological Sciences*, 30(5), 682–696. <https://doi.org/10.1177/0956797619830329>
- Orosz, G., Tóth-Király, I., & Bőthe, B. (2016). Four facets of Facebook intensity—The development of the multi-dimensional Facebook Intensity Scale. *Personality and Individual Differences*, 100, 95–104. <https://doi.org/10.1016/j.paid.2015.11.038>
- Paakkari, L., Tynjälä, J., Lahti, H., Ojala, K., & Lyyra, N. (2021). Problematic social media use and health among adolescents. *International Journal of Environmental Research and Public Health*, 18(4), Article 1885. <https://doi.org/10.3390/ijerph18041885>
- Panova, T., & Carbonell, X. (2022). Social media addiction. In H. M. Pontes (Ed.), *Behavioral addictions: Studies in neuroscience, psychology and behavioral economics* (pp. 69–95). Springer. https://doi.org/10.1007/978-3-031-04772-5_3
- Parry, D. A., Davidson, B. I., Sewall, C. J. R., Fisher, J. T., Mieczkowski, H., & Quintana, D. S. (2021). A systematic review and meta-analysis of discrepancies between logged and self-reported digital media use. *Nature Human Behaviour*, 5(11), 1535–1547. <https://doi.org/10.1038/s41562-021-01117-5>
- Patrick, H., Neighbors, C., & Knee, C. R. (2004). Appearance-related social comparisons: The role of contingent self-esteem and self-perceptions of attractiveness. *Personality and Social Psychology Bulletin*, 30(4), 501–514. <https://doi.org/10.1177/0146167203261891>
- Pittman, M., & Reich, B. (2016). Social media and loneliness: Why an Instagram picture may be worth more than a thousand Twitter words. *Computers in Human Behavior*, 62, 155–167. <https://doi.org/10.1016/j.chb.2016.03.084>
- Primack, B. A., Shensa, A., Escobar-Viera, C. G., Barrett, E. L., Sidani, J. E., Colditz, J. B., & James, A. E. (2017). Use of multiple social media platforms and symptoms of depression and anxiety: A nationally-representative study among US young adults. *Computers in Human Behavior*, 69, 1–9. <https://doi.org/10.1016/j.chb.2016.11.013>
- Rohrer, J. M. (2018). Thinking clearly about correlations and causation: Graphical causal models for observational data. *Advances in Methods and Practices in Psychological Science*, 1, 27–42. <https://doi.org/10.1177/2515245917745629>
- Rosenberg, M. (1965). *Rosenberg Self-Esteem Scale (RSES)* [Database record]. APA PsycTests. <https://doi.org/10.1037/t01038-000>
- Ryan, R. M., & Deci, E. L. (2018). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Publications. <https://doi.org/10.1521/978.14625/28806>
- Sabik, N. J., Falat, J., & Magagnos, J. (2020). When self-worth depends on social media feedback: Associations with psychological well-being. *Sex Roles*, 82(7), 411–421. <https://doi.org/10.1007/s11199-019-01062-8>
- Saiphoo, A. N., Halevi, L. D., & Vahedi, Z. (2020). Social networking site use and self-esteem: A meta-analytic review. *Personality and Individual Differences*, 153, Article 109639. <https://doi.org/10.1016/j.paid.2019.109639>
- Shakya, H. B., & Christakis, N. A. (2017). Association of Facebook use with compromised well-being: A longitudinal study. *American Journal of Epidemiology*, 185(3), 203–211. <https://doi.org/10.1093/aje/kww189>
- Shannon, H., Bush, K., Villeneuve, P. J., Helleman, K. G., & Guimond, S. (2022). Problematic social media use in adolescents and young adults: Systematic review and meta-analysis. *JMIR Mental Health*, 9(4), Article e33450. <https://doi.org/10.2196/33450>
- Sirola, A., Savela, N., Savolainen, I., Kaakinen, M., & Oksanen, A. (2021). The role of virtual communities in gambling and gaming behaviors: A systematic review. *Journal of Gambling Studies*, 37(1), 165–187. <https://doi.org/10.1007/s10899-020-09946-1>
- Statista (2023). *Average daily time spent on social media worldwide 2012–2023*. <https://www.statista.com/statistics/433871/daily-social-media-usage-worldwide/>
- Sun, Y., & Zhang, Y. (2021). A review of theories and models applied in studies of social media addiction and implications for future research. *Addictive Behaviors*, 114, Article 106699. <https://doi.org/10.1016/j.addbeh.2020.106699>
- Twenge, J. M., Haidt, J., Joiner, T. E., & Campbell, W. K. (2020). Underestimating digital media harm. *Nature Human Behaviour*, 4(4), 346–348. <https://doi.org/10.1038/s41562-020-0839-4>

- Underwood, C. (2023). Multiple approaches to examining gender norms in romantic relationships. *UNLV Theses, Dissertations, Professional Papers, and Capstones*, Article 4794. <https://digitalscholarship.unlv.edu/thesesdissertations/4794>
- Valkenburg, P. M., van Driel, I. I., & Beyens, I. (2021). *Social media and well-being: Time to abandon the active-passive dichotomy*. OSF. <https://doi.org/10.31234/osf.io/j6xqz>
- Vallerand, R. J., Blanchard, C. M., Mageau, G. A., Koestner, R., Ratelle, C., Léonard, M., Gagné, M., & Marsolais, J. (2003). Les passions de l'âme: On obsessive and harmonious passion. *Journal of Personality and Social Psychology*, 85(4), 756–76. <https://doi.org/10.1037/0022-3514.85.4.756>
- Van den Eijnden, R. J., Lemmens, J. S., & Valkenburg, P. M. (2016). The Social Media Disorder Scale. *Computers in Human Behavior*, 61, 478–487. <https://doi.org/10.1016/j.chb.2016.03.038>
- Van Rooij, T., Ferguson, C. J., Van de Mheen, D., & Schoenmakers, T. M. (2017). Time to abandon internet addiction? Predicting problematic internet, game, and social media use from psychosocial well-being and application use. *Clinical Neuropsychiatry*, 14(1), 113–121. <http://hdl.handle.net/1854/LU-8198559>
- 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>
- Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture*, 3(4), 206–222. <https://doi.org/10.1037/ppm0000047>
- Vogels, E. A., & Gelles-Watnick, R. (2023, April 24). *Teens and social media: Key findings from Pew Research Center surveys*. Pew Research Center. <https://www.pewresearch.org/short-reads/2023/04/24/teens-and-social-media-key-findings-from-pew-research-center-surveys/>
- Vrieze, S. I. (2012). Model selection and psychological theory: A discussion of the differences between the Akaike information criterion (AIC) and the Bayesian information criterion (BIC). *Psychological Methods*, 17(2), 228–243. <https://doi.org/10.1037/a0027127>
- Ward, D. E., Park, L. E., Walsh, C. M., Naragon-Gainey, K., Paravati, E., & Whillans, A. V. (2021). For the love of money: The role of financially contingent self-worth in romantic relationships. *Journal of Social and Personal Relationships*, 38(4), 1303–1328. <https://doi.org/10.1177/0265407521991663>
- Yu, L., Cao, X., Liu, Z., & Wang, J. (2018). Excessive social media use at work: Exploring the effects of social media overload on job performance. *Information, Technology & People*, 31(6), 1091–1112. <https://doi.org/10.1108/ITP-10-2016-0237>

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