

Social Comparison, Social Media, and Self-Esteem

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Social networking sites (SNSs), such as Facebook, provide abundant social comparison opportunities. Given the widespread use of SNSs, the purpose of the present set of studies was to examine the impact of chronic and temporary exposure to social media-based social comparison information on self-esteem. Using a correlational approach, Study 1 examined whether frequent Facebook use is associated with lower trait self-esteem. Indeed, the results showed that participants who used Facebook most often had poorer trait self-esteem, and this was mediated by greater exposure to upward social comparisons on social media. Using an experimental approach, Study 2 examined the impact of temporary exposure to social media profiles on state self-esteem and relative self-evaluations. The results revealed that participants' state self-esteem and relative self-evaluations were lower when the target person's profile contained upward comparison information (e.g., a high activity social network, healthy habits) than when the target person's profile contained downward comparison information (e.g., a low activity social network, unhealthy habits). Results are discussed in terms of extant research and their implications for the role of social media in well-being.

Keywords: social comparison, self-esteem, social media, Internet, social networks

Social media is pervasive, especially popular social networking sites (SNSs) like Facebook, which has over a billion users around the world (Facebook, 2012). SNSs allow users to construct electronic profiles for themselves, provide details about their lives and experiences, post pictures, maintain relationships, plan social events, meet new people, make observations of others' lives, fulfill belongingness needs, and express their beliefs, preferences, and emotions (Boyd & Ellison, 2007; Ivcevic & Ambady, 2012; Nadkarni & Hofmann, 2012; Tosun, 2012). Given the relevance of SNSs to a variety of social functions, we suggest that people also use SNSs (either consciously or unconsciously; Haferkamp & Kramer, 2011) as a basis for social comparative functions, such as self-evaluation (Festinger, 1954) or self-enhance-

ment (Gruder, 1971; Wills, 1981). Because SNSs offer abundant opportunities for social comparison using detailed information about others, the current research examined whether exposure to social media is associated with changes in self-evaluation (e.g., self-esteem), and whether this might be due to social comparison processes.

Social Comparison and Social Media

Humans are thought to possess a fundamental drive to compare themselves with others, which serves a variety of functions, such as fulfilling affiliation needs (Schachter, 1959), evaluating the self (Festinger, 1954), making decisions (Camerer & Lovallo, 1999), being inspired (Lockwood & Kunda, 1997), and regulating emotions and well-being (Taylor & Brown, 1988; Tesser & Campbell, 1982). Upward social comparison occurs when comparing oneself with superior others who have positive characteristics, whereas downward social comparison occurs when comparing oneself with inferior others who have negative characteristics (Wills, 1981; Wood, 1989). Although upward comparison can be beneficial when it inspires people to become more like their comparison targets (Lockwood & Kunda, 1997), it more often

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causes people to feel inadequate, have poorer self-evaluations, and experience negative affect (Marsh & Parker, 1984; Morse & Gergen, 1970; Pyszczynski, Greenberg, & LaPrelle, 1985). On the other hand, although downward comparison can, at times, make people feel negative because it reveals how things could be worse (Aspinwall, 1997), it more often leads to improvements in affect and self-evaluation (Wills, 1981).

Traditionally, social comparisons in “offline” contexts revolve around in-person interactions with close others (e.g., coworkers, friends, family). As people are increasingly using SNSs, we suggest that the majority of the social comparative information that they receive in their daily lives may lean in a positive (upward comparison) direction. Indeed, SNSs provide the perfect platform for meticulous self-presentation. Users can selectively allow content onto their profiles, post pictures, and describe themselves in ways that best represent their ideal self-views (Rosenberg & Egbert, 2011). For example, Facebook is an attractive platform for self-presentation because users can take their time to strategically construct online personas that emphasize their most desirable traits (Gonzales & Hancock, 2011), whereas face-to-face interactions do not allow for the same degree of contemplation or flexibility (Ellison, Heino, & Gibbs, 2006). In support of the general idea that profiles on SNSs are projecting positive (rather than negative) images, Chou and Edge (2012) found that frequent Facebook users believe that other users are happier and more successful than themselves, especially when they do not know the other users well offline. It appears, then, that people might be comparing their realistic *offline* selves to the idealized *online* selves of others, which may be detrimental for well-being and self-evaluations.

In sum, SNS users can convey their personal characteristics (e.g., successes, personalities, emotions) via pictures and posts that can make them an upward or downward comparison target to other users. We suggest that SNSs also offer up distinct information that is not typically conveyed in more traditional “offline” social comparison situations. Namely, SNSs contain quantitative and qualitative information about the person’s *social network*, such as the number

of people in the network and the amount of engagement the person has with network members. For example, a person who has an active social network (e.g., receives numerous comments, replies, and virtual “likes” or approval of their content) may be an upward comparison target in terms of popularity, sociability, or perceived social capital (Kim & Lee, 2011; Vitak & Ellison, 2013). Thus, in addition to viewing “personal” upward comparison information (e.g., about a person’s successes, attractiveness), a person can obtain “social” upward comparison information by observing the activity of their social network.

Self-Esteem

Self-esteem refers to a person’s positive or negative evaluation of the self; that is, the extent to which an individual views the self as worthwhile and competent (Coopersmith, 1967). Self-esteem is the evaluative emotional component of the broader self-concept (Heatherton & Wyland, 2003) and serves various social and existential functions (e.g., acceptance in groups, meaning in life; Leary, Tambor, Terdal, & Downs, 1995; Solomon, Greenberg, & Pyszczynski, 1991). Notably, self-esteem can be conceptualized as both a mostly stable trait that develops over time and a fluid state that is responsive to daily events and contexts (Heatherton & Polivy, 1991).

As a consequence of chronic or temporary exposure to primarily upward social comparison information on social media, there could be a deleterious impact on people’s self-evaluations and self-esteem. In particular, we suggest that trait self-esteem may be affected by long-term exposure to social media in everyday life, while state self-esteem may be affected by incidental use (e.g., brief exposure to an unknown social media profile in a lab setting). Some prior research has revealed that high-frequency Facebook use is associated with increased depression and decreased well-being (Feinstein et al., 2013; Kalpidou, Costin, & Morris, 2011; Kross et al., 2013; Mehdizadeh, 2010; Rutledge, Gillmor, & Gillen, 2013). Additionally, some extant research has examined whether exposure to Facebook affects self-esteem (Forest & Wood, 2012; Gonzales & Hancock, 2011; Wilcox & Stephen, 2013). However, no study to date has examined whether the effect of Facebook use on

self-esteem is mediated by social comparison processes.

Current Research

Given the prominent role of SNSs in modern daily communication and the self-presentation biases they entail, it is important for researchers to understand the potential contribution of SNSs to upward social comparisons and their consequences on users' well-being. As prior research has shown that people tend to believe that other social media users have better lives than they do (Chou & Edge, 2012), it stands to reason that, all else equal, people who use Facebook most frequently should have the most exposure to such upward social comparisons. Moreover, prior research in offline contexts has shown that exposure to upward social comparison information can increase negative affect and deflate self-views (Brown, Novick, Lord, & Richard, 1992; Cash, Cash, & Butters, 1983; Morse & Gergen, 1970; Pyszczynski et al., 1985; Thornton & Moore, 1993; Wheeler & Miyake, 1992). More directly relevant to the current research, prior studies have shown that people who make social comparisons on social media report greater depressive symptoms (Feinstein et al., 2013) and evaluate their current self as being more discrepant from their ideal self (Haferkamp & Kramer, 2011), and also that people who spend more time on Facebook tend to have lower well-being (Kalpidou et al., 2011; Mehdizadeh, 2010; see also Kross et al., 2013).

Integrating these prior results and ideas together, we anticipated that people who used Facebook most frequently would have poorer self-esteem and that this relationship would be mediated by upward social comparison on Facebook. We tested this hypothesis across two studies, one correlational and one experimental. The correlational study tested the proposed mediational model by examining the relationship between chronic Facebook use and trait self-esteem. The experimental study manipulated the proposed mediator—social comparison on Facebook—and tested the effects of short-term Facebook use on state self-esteem.

Overview of Study 1

In Study 1, we used a correlational approach to determine whether people who have greater exposure to upward social comparisons via SNSs have lower trait self-esteem. College student participants completed a series of questionnaires pertaining to their Facebook use, self-esteem, and extent to which they made upward versus downward social comparisons on Facebook. First, we operationalized exposure to SNSs as frequency of Facebook use because it is the most common measure of Facebook use in the literature and because it is more directly relevant to chronic exposure to SNSs and upward comparison information than are other measures of Facebook use (e.g., number of friends in network, intensity or depth of use). Second, to assess self-esteem, we used the validated Rosenberg Self-Esteem Scale (Rosenberg, 1965), which assesses a person's global evaluations of themselves (e.g., "I feel that I am a person of worth, at least on an equal plane to others"). Third, to assess social comparison exposure, we asked participants about the extent to which they tend to focus on people who are better off and worse off than themselves on Facebook.

Overview of Study 2

In Study 2, we used an experimental approach to examine whether temporary exposure to social media-based social comparison information would impact state self-esteem and self-evaluations. The goal was to provide experimental evidence for the role of upward social comparisons in affecting well-being and self-evaluations. In the study, participants were exposed to fictitious social media profiles that varied in terms of whether the information conveyed an upward or downward social comparison status. Moreover, we also attempted to shed some light on what category of information in others' SNS profiles might be critical for impacting self-esteem and self-evaluations by including both personal (e.g., pictures and status updates displaying personal characteristics) and social (e.g., number of "likes" and comments displaying social network connections) information to convey upward or downward comparison status.

Study 1

Method

Participants. Participants were 145 undergraduates (106 female) from a Midwestern university in the United States who participated in exchange for course credit. The median age was 19.00 ($M = 19.64$, $SD = 2.87$). The racial makeup of the sample was 64.1% White, 22.8% Black, 4.1% Asian, 1.4% American Indian or Alaskan Native, 4.8% mixed race, and 2.8% unknown race(s).

Procedure and Measures. Participants came to the lab for a larger study involving social media use in college students, and all portions were completed on computers using MediaLab software (Jarvis, 2008). Most relevant to the present manuscript, participants were asked about their social media use, self-esteem, and extent of upward versus downward social comparisons on Facebook. Measures that examine these constructs are described below. Upon completion of the questionnaires (in the order described below), participants were thanked and debriefed.

Facebook use. To assess Facebook use, we asked the following questions related to participants' frequency of use (derived from Rouis, Limayem, & Salehi-Sangari, 2011): "How often do you use Facebook?" (1 = *never*; 5 = *very often*); "How often do you update your Facebook status?" (1 = *never or almost never*; 2 = *once a year*; 3 = *once a month*; 4 = *once a week*; 5 = *once a day*; 6 = *multiple times a day*); "How often do you comment on others' Facebook profiles?" (1 = *never or almost never*; 2 = *once a year*; 3 = *once a month*; 4 = *once a week*; 5 = *once a day*; 6 = *multiple times a day*); and "Approximately how many hours per week do you spend on Facebook?" (open-ended response). Responses to these measures were standardized, and reliability and factor analyses were conducted. Importantly, a factor analysis using maximum likelihood extraction showed that all items loaded onto a single factor (eigenvalue = 2.28; 56.99% of variance explained) and a reliability analysis revealed that the items were highly related ($\alpha = .85$). Subsequently, an overall index of "Frequency of Facebook Use" was created.¹

Social comparisons on Facebook. To assess participants' upward and downward comparison tendencies on Facebook, we asked: "When comparing yourself to others on Facebook, to what extent do you focus on people who are better off than you?" and "When comparing yourself to others on Facebook, to what extent do you focus on people who are worse off than you?" (1 = *not at all*; 5 = *a great deal*).

Rosenberg Self-Esteem Scale. To assess trait self-esteem, we used the *Rosenberg Self-Esteem Scale* (Rosenberg, 1965). For this inventory, participants indicated their agreement with 10 statements on 7-point Likert type scales (1 = *not at all true*; 7 = *very true*). Sample items include "I feel that I am a person of worth, at least on an equal plane to others" and "All in all, I am inclined to feel that I am a failure" ($\alpha = .87$; $M = 5.80$, $SD = 1.01$).

Results and Discussion

Table 1 displays the correlations among the key dependent measures. Critically, as expected, frequency of Facebook use was negatively correlated with self-esteem, $r(143) = -.20$, $p = .02$, where participants with more exposure to Facebook tended to evaluate themselves more poorly. Frequency of Facebook use was also associated with an increase in the extent to which participants reported making social comparisons on Facebook, both upward ($r = .26$, $p < .01$) and downward

¹ As stated in the introduction, there are several ways to assess Facebook use; thus, a variety of other measures were included in the study—the majority of which are beyond the scope of the current manuscript. Of note, a potentially relevant construct that we assessed was intensity of Facebook use via the *Bergen Facebook Addiction Scale* (Andreassen et al., 2012). For this inventory, participants indicate their agreement with six statements on 5-point Likert-type scales (1 = *very rarely*; 5 = *very often*), such as "You have tried to cut down on the use of Facebook without success" and "You become restless or troubled if you are prohibited from using Facebook." In the current manuscript, the Facebook addiction measure was deemed to be less theoretically relevant to our ideas about amount of use leading to increased exposure to upward comparison information. It is notable, though, that Facebook frequency of use and addiction were highly correlated ($r = .65$, $p < .01$) and had comparable relationships with our other measures, such as self-esteem and amount of upward and downward comparisons on Facebook. We return to the issue of how to best conceptualize Facebook use in the General Discussion.

Table 1
Correlations Between Key Measures in Study 1

	Facebook use	Self-esteem	Upward comparison	Downward comparison
Facebook use	—	-.20*	.26**	.20**
Self-esteem	—	—	-.35**	-.30**
Upward comparison	—	—	—	.66**
Downward comparison	—	—	—	—

* $p \leq .05$. ** $p \leq .01$.

($r = .20, p = .02$). That is, participants who used Facebook the most tended to report a greater extent of both upward and downward social comparisons. However, consistent with our hypotheses, a paired samples t test showed that, on average, people reported more upward social comparisons on Facebook ($M = 2.17, SD = 1.11$) than downward social comparisons ($M = 1.92, SD = 0.98$), $t(144) = 3.40, p = .001, d = .29$.

Next, to determine whether the effect of Facebook use on self-esteem was mediated by increased upward social comparisons via Facebook, a path and bootstrapping analysis was conducted using methods described by Preacher and Hayes (2008), yielding unstandardized regression coefficients for the pathways analyzed. The independent variable for these analyses was frequency of Facebook use; the dependent variable was self-esteem, and the mediators were the extent of upward and downward social comparison. As can be seen in Figure 1, frequency of Facebook use was a significant predictor of self-esteem ($b = -.24, t = -2.45, p < .02$), indicating that participants high in Facebook use had lower self-esteem. Results also showed that frequency of Facebook use was a positive predictor of both the extent of upward comparisons ($b = .34, t = 3.15, p < .01$) and downward comparisons ($b = .23, t = 2.43, p < .02$), although the relationship was stronger for upward comparisons. Upward comparisons on Facebook also predicted lower self-esteem ($b = -.22, t = -2.32, p = .02$). However, downward comparisons on Facebook did not predict self-esteem ($b = -.12, t = -1.13, p = .26$).² Critically, inclusion of the mediators (upward and downward social comparison on Facebook) reduced the significance of the path between frequency of Fa-

cebook use and self-esteem ($b = -.14, t = -1.43, p = .15$), providing evidence that the path between frequency of Facebook use and self-esteem is significantly mediated by the extent of exposure to upward social comparisons on Facebook. Moreover, an accelerated-biased-corrected bootstrap analysis using 5,000 resamples (Preacher & Hayes, 2008) showed that the mediation path through upward comparisons on Facebook was significant (95% CI: $-.18, -.013$) but that the mediation path through downward comparisons was not significant (95% CI: $-.12, .02$). Overall, frequency of Facebook use explained 14% of the variance in self-esteem (through direct and indirect paths), $F(3, 141) = 7.84, p < .01$. Importantly, without the addition of the mediators in the model, frequency of Facebook use only accounted for 4% of the

² It is notable that degree of upward comparisons and downward comparisons were both negatively correlated with self-esteem (see Table 1). One might expect that upward comparisons should be associated with poorer self-esteem (as demonstrated) but that downward comparisons should be associated with better self-esteem (which was not demonstrated). Although that pattern might be sensible, prior work does show that sometimes downward comparisons facilitate poorer self-evaluations in the same way that upward comparisons do. This is particularly true if the target person is viewed as similar to the self, which may be the case on Facebook where most "friends" tend to be similar others around the user's same age. Thus, when viewing downward comparison targets on Facebook, rather than thinking "At least I'm not like them" and feeling better about themselves, a person might think "If I'm not careful, I could turn out like them" and feel worse about themselves (Mussweiler, Ruter, & Epstude, 2004). Of course, upward comparison information appears to be most relevant when examined simultaneously in the model—suggesting that more psychological and statistical weight is placed upon upward social comparison information in the context of self-evaluations.

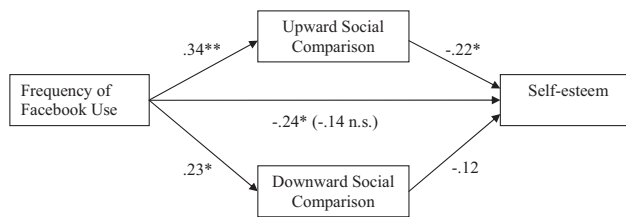


Figure 1. Mediation of the relationship between Facebook use (IV) and self-esteem (DV) through the extent of upward and downward social comparisons in Study 1. Coefficients were derived from a bootstrap procedure (Preacher & Hayes, 2008). Coefficients in parentheses are for the influence of the IV on the DV when controlling for the mediator (* $p \leq .05$; ** $p \leq .01$).

variance in self-esteem, $F(1, 143) = 6.01$, $p = .02$.³

Study 2

Study 1 provided support for the idea that frequent users of social media have lower self-esteem and that this is mediated by exposure to upward social comparisons. However, as Study 1 is correlational, the causal relationship between the variables is unclear. Although it is our contention that self-esteem is lowered among high frequency users because of more upward social comparisons via social media, other causal pathways are possible. For instance, it could be that people with low self-esteem differ in their social media use and exposure to upward social comparisons (e.g., Forest & Wood, 2012; see also Seidman, 2013; Steinfield, Ellison, & Lampe, 2008). Although there is reason to suspect that Facebook use precedes changes in affect and well-being (see Kross et al., 2013), Study 2 used an experimental approach to examine whether temporary exposure to social media-based comparisons has an impact on self-evaluations and state self-esteem. Thus, the goal of Study 2 was to manipulate the social comparison mechanism explored in Study 1 to provide direct experimental evidence of its causal impact on self-evaluations.

Participants came to the lab for a study on person perception in the context of social media and viewed an SNS profile that we designed to vary across a couple dimensions. As alluded to in the introduction, we manipulated social media profile content in two distinct ways to convey upward or downward directional status: (a) through “personal” content ostensibly posted by the user him/herself (e.g., photos and status

updates conveying the user’s personal attributes, notably whether they engage in healthy or unhealthy behaviors) and (b) through “social” content ostensibly posted by the user’s social network (e.g., comments and virtual “likes” conveying the user’s popularity and social connectedness). Thus, participants read one of four fictitious social media profiles, resulting in a 2 (personal user content conveying upward

³ As prior research has shown that females have lower self-esteem and greater use of social media (Joinson, 2008; Kling, Hyde, Showers, & Buswell, 1999; Tufekci, 2008), we examined whether participant sex was related to our key dependent measures. Indeed, female participants had lower self-esteem ($r = -.21$, $p < .02$) and more frequent Facebook use ($r = .24$, $p < .01$). However, when entered as a covariate in our main analyses, the results did not change. First, none of the zero-order correlations reported in Table 1 changed in significance (all r s $> |.161|$, p s $\leq .05$). Second, when entered into the bootstrap and path analysis, participant sex was a significant covariate ($b = -.39$, $t = -2.22$, $p = .03$). Importantly, however, the main findings of the path and bootstrap analysis do not differ when participant sex is included as a covariate. Indeed, the following continue to be true for the path and bootstrapping analysis with participant sex entered as a covariate: Facebook use predicted self-esteem ($b = -.19$, $t = -1.92$, $p = .05$); Facebook use predicted upward social comparison ($b = .34$, $t = 3.04$, $p < .01$) and downward social comparison ($b = .24$, $t = 2.45$, $p < .02$); upward social comparison predicted self-esteem ($b = -.21$, $t = -2.28$, $p = .02$) but downward social comparison did not ($b = -.13$, $t = -1.25$, $p = .21$); controlling for upward and downward social comparison reduced the significance of the path between Facebook use and self-esteem (b s = $-.19$ vs. $-.09$, t s = -1.92 vs. -0.90 , p s = $.05$ vs. $.37$); the mediation path through upward comparisons was significant (95% CI: $-.18$, $-.004$) and the mediation path through downward comparisons was not significant (95% CI: $-.13$, $.02$); and, finally, the overall model accounted for 17% of the variance through direct and indirect paths, $F(4, 140) = 7.28$, $p < .01$, which was more than the 4% accounted for without the inclusion of the mediators in the model.

or downward status) \times 2 (social network content conveying upward or downward status) completely between-participants design. Immediately after viewing the profile, participants rated their state self-esteem and also made relevant trait-based evaluations of the target person and themselves.

Consistent with prior research that has examined social comparison in the context of social media (Haferkamp & Kramer, 2011; but see General Discussion for more on how our study differs from this prior research), we hypothesized that temporary exposure to profiles with upward comparison information—regardless of whether the content was personal or social in nature—would be associated with poorer self-evaluations and lower state self-esteem. However, we also reasoned that there could be important differences based on whether the content was personal or from the social network. Namely, we thought it possible that social network content could be more impactful because (a) SNSs like Facebook tend to be oriented toward networking, popularity, and building social capital and hence users could be particularly attuned to this information in others' profiles (Kim & Lee, 2011; Steinfield et al., 2008), (b) feedback from others (i.e., comments, "Likes") on SNSs can be very powerful in terms of the effect on well-being (Valkenburg, Peter, & Schouten, 2006), and (c) social network activity may be perceived as more reliable and diagnostic than self-generated content because a user can modify his or her own content to portray the self in a positive light whereas information from others is more objective and impartial (Walther & Parks, 2002; Walther, Van Der Heide, Hamel, & Shulman, 2009).

Method

Participants and design. Participants were 128 undergraduates (94 female) from the same university as Study 1 who also participated in exchange for course credit. The median age was 19.00 ($M = 19.08$, $SD = 1.63$). The sample was 61.7% White, 17.2% Black, 3.9% Asian, .8% American Indian or Alaskan Native, 12.5% mixed race, and 3.9% unknown race(s). Participants were randomly assigned to one cell in a 2 (user content: upward-healthy or downward-unhealthy) \times 2 (social network content: up-

ward-active or downward-inactive) completely between-participants design. Said differently, participants learned the following information about the target person: (a) he or she was an upward comparison on user content and social network content; (b) he or she was an upward comparison on user content but a downward comparison on social network content; (c) he or she was a downward comparison on user content but an upward comparison on social network content; or (d) he or she was a downward comparison on user content and social network content.

Manipulations, measures, and procedure.

Participants signed up to take part in a study about social media and person perception. All portions were completed on computers using MediaLab software (Jarvis, 2008). Upon arrival in the lab, participants were told that we were interested in people's perceptions of others in the context of social media. Participants then viewed a social media profile created by the researchers that purportedly belonged to another student of their same sex at their university. Participants spent three minutes viewing the profile and were told to remember details about the target person.

The characteristics of the profile were manipulated along two key dimensions. First, to manipulate the user content to convey upward or downward comparative information, the target profile was either portrayed as engaging in healthy behaviors (upward comparison) or unhealthy behaviors (downward comparison) that would presumably affect the target person's fitness, attractiveness, well-being, and vitality. We chose this dimension because health, appearance, and fitness were deemed to be important for young college students. Indeed, in a pilot test of 14 undergraduate students, these dimensions were reported to be important aspects of their lives ($M = 4.18$, $SD = 0.65$, where 1 = *not at all important* and 5 = *very important*; $t(13) = 6.75$, $p < .01$, $d = 1.82$ when compared with the midpoint of the scale). More specifically for this manipulation, the target person's posts included a picture of a dinner he or she made (healthy or unhealthy for upward or downward comparison, respectively), a status announcing a new personal record in either running (upward-healthy) or an online game (downward-unhealthy), a status update and a scenic photo from a family vacation that

involved hiking (upward-healthy) or relaxing on the beach (downward-unhealthy), and a status about recent volunteer work that consisted of building houses (upward-healthy) or reading to children (downward-unhealthy).

Second, to manipulate social network content, the target profile either had high network member activity (upward-high activity) or low activity (downward-low activity). For example, when the target posted a photograph of recent vacation activity, the social network either had a large number of “likes” and comments attached to the photograph (upward-high activity) or a small number of “likes” and comments (downward-low activity). Posts in the “high activity” condition received 8 to 15 “likes” and 2 to 4 comments, whereas posts in the “low activity” condition received 1 to 3 “likes” and 0 to 2 comments. Notably, comments were always positive but also somewhat generic (e.g., “Sounds cool!”, “Awesome”).

Aside from what is discussed above, the social media profiles were otherwise identical across the four conditions. For instance, the name, interests, number of friends, and other content did not vary. Additionally, the profile picture was kept constant across experimental conditions and depicted the face of either a male or female student, both in their early 20s, who consented to have their pictures used in the experiment. Finally, all conditions included four identical “filler” posts to enhance the realism of the profiles. Two of the filler posts were from friends, one was a status update about a concert, and one was a picture of autumn trees with the caption “I love fall.” The content of the filler posts was intended to be neutral with regard to health, activity level, and fitness. After viewing the profile, participants completed the main dependent measures.

State Self-Esteem Scale. To assess temporary changes in self-esteem, we used the *State Self-Esteem Scale* (Heatherton & Polivy, 1991). For each of 20 items, participants responded on 5-point scales (1 = *not at all*; 5 = *extremely*). Sample items included “I feel confident about my abilities,” “I feel good about myself,” and “I feel inferior to others at this moment.”

Target and self-evaluations. In addition to our primary measure of state self-esteem, participants also made relevant domain-specific evaluations of themselves and the target person. In particular, using 7-point scales (1 = *not at*

all; 7 = *extremely*), participants judged the extent to which the target person and themselves were attractive, healthy, fit, likable, and popular. These dimensions were chosen because they were most relevant to our manipulations.

Results and Discussion

State self-esteem. To examine the impact of the manipulations on our state self-esteem measure, the set of state self-esteem items was collapsed ($\alpha = .90$) and submitted to a 2 (user content: upward-healthy or downward-unhealthy) \times 2 (social network content: upward-high activity or downward-low activity) between-participants ANOVA. See Table 2. Our core hypothesis was that participants would have lower state self-esteem after temporary exposure to the upward comparison target than the downward comparison target. Recall that we also thought it was possible that the social network content manipulation might produce a stronger main effect difference than the user content manipulation.

As expected, there was a significant main effect of social network content, $F(1, 124) = 3.76, p = .05, \eta_p^2 = .03$. Participants had lower state self-esteem after exposure to the target with the high activity social network (upward comparison; $M = 3.53, SD = 0.60$) than the low activity social network (downward comparison;

Table 2
Main Dependent Measures as a Function of User Content and Social Network Content in Study 2

User content and measure	Social network content			
	Upward-high activity		Downward-low activity	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Upward-healthy				
State self-esteem	3.51	0.65	3.65	0.64
Self-rating	4.39	0.92	4.70	0.86
Target rating	5.39	0.76	5.35	0.82
Downward-unhealthy				
State self-esteem	3.55	0.55	3.83	0.62
Self-rating	4.61	0.78	4.91	0.81
Target rating	4.81	0.69	4.78	0.85

Note. State self-esteem items were rated on 5-point scales (1 = *not at all*; 5 = *extremely*), where higher numbers indicate better temporary self-esteem. Self and target ratings were aggregated from evaluations of how attractive, fit, popular, likeable, and healthy each was on 7-point scales (1 = *not at all*; 7 = *extremely*).

$M = 3.74$, $SD = 0.63$), $d = .34$. However, the main effect for user content was not significant, $F(1, 124) = 1.17$, $p = .28$, $\eta_p^2 = .01$, suggesting that state self-esteem was not affected upon learning about a target person who was an upward versus downward comparison target on personal characteristics related to health and fitness. Finally, the user content \times social network content interaction was also not significant, $F(1, 124) = .48$, $p = .49$, $\eta_p^2 = .004$, suggesting that the combinations of upward versus downward comparison status across the user and social network content were not critical for state self-esteem.

Target and self-evaluations. Recall that participants also made specific evaluations of themselves and the target person in terms of attractiveness, healthiness, fitness, likability, and popularity. Ratings on the set of items were related and collapsed separately for the target ($\alpha = .67$) and the self ($\alpha = .71$) for analysis purposes. These aggregated ratings were then submitted to a 2 (user content: upward-healthy or downward-unhealthy) \times 2 (social network content: upward-high activity or downward-low activity) \times 2 (source: target or self) mixed-model ANOVA, with the last factor as a within-participants variable. See Table 2.

Consistent with the state self-esteem variable, our core hypothesis was that participants would rate the self and target differently as a function of upward or downward comparison standing on both the user content and social network

content variables—again with the possibility that the social network content variable could produce a stronger difference between the downward and upward comparison conditions. As the interaction effects (particularly the two-way interactions) are proximal and most relevant to hypotheses, we begin by discussing these. The three-way interaction (source \times user content \times social network content) was not significant, $F(1, 124) = .001$, $p = .98$, $\eta_p^2 < .00$, which rules out that there were any asymmetries between social network and user content in terms of self versus target rating differences. Critical to our hypothesis, there was a significant source \times user content interaction, $F(1, 124) = 14.20$, $p < .01$, $\eta_p^2 = .10$. As can be seen in Figure 2, target ratings ($M = 5.37$, $SD = 0.78$) were more positive than self-ratings ($M = 4.54$, $SD = 0.90$) in the upward-healthy comparison condition, $t(63) = 5.14$, $p < .01$, $d = .64$; on the other hand, target ratings ($M = 4.80$, $SD = 0.77$) and self-ratings ($M = 4.76$, $SD = 0.81$) did not differ from one another in the downward-unhealthy comparison condition $t(63) = .28$, $p = .78$, $d = .04$. Thus, it appears that when the target person had a healthy lifestyle (e.g., posted about beating a personal running record), participants saw a greater negative discrepancy between the target person and themselves on the list of positive attributes; however, when the target person had a less healthy lifestyle (e.g., posted about beating a

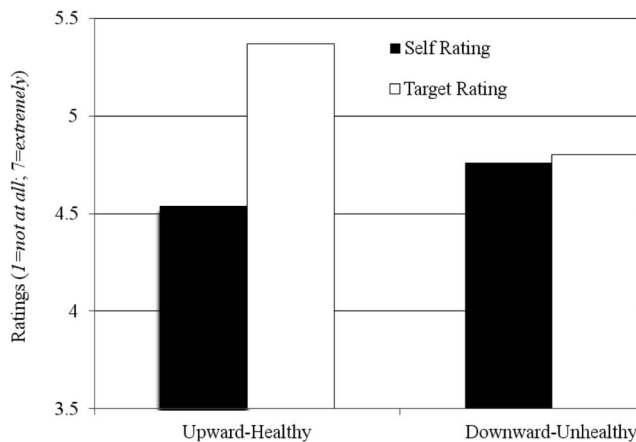


Figure 2. Self and target ratings as a function of user content in Study 2. Higher numbers reflect more positive ratings.

personal gaming record), participants viewed themselves and the target person similarly.

Also relevant to our hypothesis, there was a marginally significant source \times social network content interaction, $F(1, 124) = 2.49, p = .11, \eta_p^2 = .02$. As can be seen in Figure 3, the nature of this interaction was similar to that of the user content interaction (albeit somewhat weaker), where target ratings ($M = 5.10, SD = .78$) were more positive than self-ratings ($M = 4.50, SD = 0.86$) in the upward-high activity condition, $t(64) = 3.97, p < .01, d = .49$. However, this effect was modulated in the downward-low activity condition, where target ratings ($M = 5.07, SD = 0.87$) and self-ratings ($M = 4.81, SD = 0.84$) were only marginally different from one another, $t(62) = 1.65, p = .10, d = .21$. Thus, it appears that when the target person had a high activity social network (e.g., received more virtual likes for posted content), participants saw a greater discrepancy between the target person and themselves on the list of positive attributes; however, when the target person had a low activity social network (e.g., received fewer virtual likes for posted content), participants viewed the self and the target person relatively more similarly.

Less relevant to our core hypotheses was the user content \times social network content interaction, which was not significant ($F(1, 124) < .00, p = .99, \eta_p^2 < .00$), and the main effects. It is notable that, in terms of the main effects, these are less interpretable and valuable in light of the

aforementioned higher-order interactions. Nevertheless, there was a main effect for source, $F(1, 124) = 17.02, p < .01, \eta_p^2 = .12$, where ratings were more positive for the target overall ($M = 5.09, SD = 0.82$) than for the self ($M = 4.65, SD = 0.86$), $d = .52$. There was also a marginal main effect of user content, $F(1, 124) = 3.22, p = .08, \eta_p^2 = .03$, where ratings were more positive overall in the upward-healthy comparison condition ($M = 4.96, SD = 0.54$) than the downward-unhealthy comparison condition ($M = 4.78, SD = 0.58$), $d = .32$. The main effect for social network content was not significant, $F(1, 124) = 1.90, p = .17, \eta_p^2 = .015$.

In sum, it appeared that user content and, to a lesser extent, social network content both had an impact on how people judged themselves relative to the target person. In particular, as hypothesized, participants rated themselves more poorly than the target person both when the target person was healthy (i.e., was an upward comparison target on personal characteristics) and also, but to a lesser extent, when the target person had a high activity social network (i.e., was an upward comparison on social characteristics). However, when the target person was unhealthy (i.e., was a downward comparison on personal characteristics) and had a low activity social network (i.e., was a downward comparison on social characteristics), ratings of the self and the target did not differ. Thus, in terms of this set of findings, it is notable that the

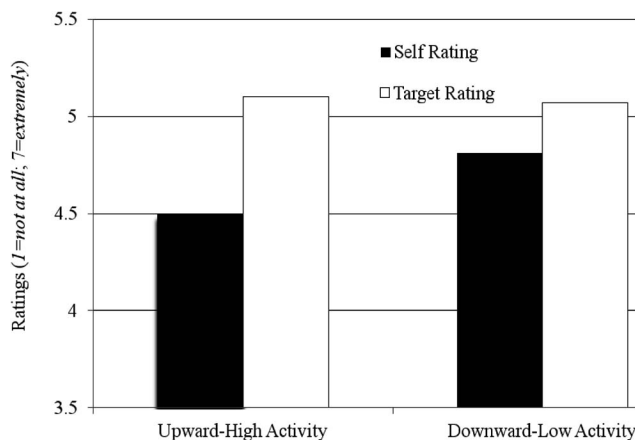


Figure 3. Self and target ratings as a function of social network content in Study 2. Higher numbers reflect more positive ratings.

ratings did not reveal a “cross-over” interaction, such that people rated themselves more positively than the target in the downward-unhealthy and downward-low activity conditions (see General Discussion for elaboration on this finding).^{4,5}

General Discussion

The current set of studies provides the best evidence to date that upward social comparison underlies the deleterious relationship between Facebook use and well-being (Feinstein et al., 2013; Kalpidou et al., 2011; Kross et al., 2013; Mehdizadeh, 2010; Rutledge et al., 2013). Across two studies employing different methodological approaches, we examined the impact of chronic and temporary exposure to social comparison information via SNSs in terms of the impact on self-evaluations (e.g., self-esteem). First, employing a correlational design, Study 1 showed that people who had the most chronic exposure to Facebook (i.e., used it most frequently) tended to have lower trait self-esteem. Moreover, the extent of upward social comparison on Facebook was greater than the extent of downward social comparison, and this extent of upward (but not downward) social comparison via Facebook significantly mediated the relationship between Facebook use and trait self-esteem.

Second, to examine the impact of temporary exposure to SNSs on state self-esteem and to provide more direct evidence about the causal impact of upward comparison via social media, Study 2 used an experimental design in which participants viewed fictitious social media profiles that varied in terms of whether the target profile was conveyed as an upward or downward comparison target. Moreover, we manipulated upward or downward comparative standing via personal user content (i.e., whether the target person engaged in healthy or unhealthy behaviors that would affect their fitness, attractiveness, and vitality) and social network content (i.e., whether the target person’s network was high or low activity on their SNS profile). Results showed that participants had lower state self-esteem and marginally poorer relative self-evaluations after exposure to a target with a high activity (vs. low activity) social network. Moreover, participants had poorer relative self-evaluations after exposure to an upward-healthy

comparison target than the downward-unhealthy comparison target. Thus, generally speaking, viewing social media profiles with positive content (e.g., upward comparison target on health and fitness, active social network) was associated with poorer state self-esteem and relative self-evaluations.

The set of results in Study 2 is generally consistent with prior research that also experimentally examined the impact of upward com-

⁴ As in Study 1, we also examined the impact of participant sex on our core variables. First, when participant sex was entered as a covariate in our main analyses, the significance levels of the critical results did not change and, if anything, the results looked stronger. Second, although it is difficult to draw firm conclusions due to the low number of males (34) across conditions in the study, there appeared to be no evidence that participant sex interacted with our main manipulations of user content and social network content. First, the state self-esteem items were submitted to a 2 (user content: upward-healthy or downward-unhealthy) \times 2 (social network content: upward-high activity or downward-low activity) \times 2 (participant sex: male or female) between-participants ANOVA. Critically, participant sex did not have any main or interaction effects on state self-esteem ($F_s < 1.3$, $p_s > .25$, $\eta_p^2 < .011$). Second, self- and target evaluations were submitted to a 2 (user content: upward-healthy or downward-unhealthy) \times 2 (social network content: upward-high activity or downward-low activity) \times 2 (participant sex: male or female) \times 2 (source: target or self) mixed-model ANOVA, with the last factor as a within-participants variable. Although there was a main effect of participant sex ($F = 7.96$, $p < .01$, $\eta_p^2 = .06$) showing that females provided higher ratings overall and an interaction between target and participant sex ($F = 8.36$, $p < .01$, $\eta_p^2 = .09$) such that females tended to provide higher ratings of the target than themselves (whereas males did not show this difference), most important was the fact that participant sex did not interact with our main manipulations of user content and social network content ($F_s < 1.92$, $p_s > .16$, $\eta_p^2 < .016$).

⁵ An anonymous reviewer asked about the relationship between state self-esteem and the domain-specific relative evaluations, and whether the difference score between self- and target evaluations might serve as a mediator of the relationship between the manipulated profile content and state self-esteem. First, there was a moderate correlation between the self-target difference score and state self-esteem ($r = .34$, $p < .01$)—suggesting that participants who felt that they had more positive characteristics than the target person also had higher state self-esteem. However, we did not uncover any evidence that the self-target difference score mediated the relationship between our independent variables and self-esteem. This was generally consistent with the fact that these two dependent measures (state self-esteem and relative self-evaluations) were, to some degree, differentially impacted by the two independent variables, hence not affording any possibility of one dependent measure to statistically mediate the effect of the independent variables on the other dependent variable.

parisons on social media (Haferkamp & Kramer, 2011). In particular, this prior set of studies exposed participants to fictitious social media profiles of very attractive/successful or unattractive/unsuccessful individuals (upward or downward comparisons) and examined participants' self-evaluations of actual versus ideal attractiveness and job success. The results revealed larger actual-ideal self-discrepancies following exposure to the upward comparison targets than the downward targets. Although our approach and findings have some similarities, our study assesses a different domain (i.e., health), examines a distinct outcome measure (i.e., self-esteem), and explores the complexity of comparison-based content on social media by manipulating both personal content and social network content.

Delving into the results of Study 2 more deeply, self-esteem—our primary construct of interest in the current studies—was more strongly impacted by the social network activity content manipulation than the user content manipulation. There are several possibilities for this set of results that we outline below. First, one possibility for this set of results is that if people primarily use SNSs to network with others, fulfill belongingness needs, and build social capital (Kim & Lee, 2011; Nadkarni & Hofmann, 2012; Steinfield et al., 2008), then a person's self-esteem might be expected to be most tied to the amount of active engagement of one's social network and also (through social comparison processes) the engagement of others with their social networks. Indeed, one prominent theory of self-esteem—sociometer theory—suggests that a person's self-worth is primarily derived from the feedback they receive from others (Leary et al., 1995).

Another potential reason that state self-esteem was more affected by social network content than by user-generated content is that the social network content might have been more salient and/or diagnostic to participants. For instance, the social network content could be viewed as more quantitative (i.e., number of comments and "likes" for a set of content), whereas the user content was more qualitative (i.e., pictures, status updates). Perhaps participants had an easier time attending to and remembering the quantitative information while forming an impression of the person. Additionally, perhaps participants put more weight or

merit to what they gleaned about the person from the social network content. This notion is compatible with work showing that self-generated content is viewed as less reliable and diagnostic than other-generated content, given that a user can alter and shape his or her own content in a positive light (Walther & Parks, 2002; Walther et al., 2009).

Finally, a third possible explanation for the difference between the effects of social network content and user-generated content on state self-esteem emerges from a specificity-matching perspective (e.g., Jaccard, King, & Pomazel, 1977; Swann, Chang-Schneider, & McClarty, 2007), which says that specific predictors should be used to predict specific responses and general predictors should be used to predict general responses. In our paradigm, the state self-esteem measure was rather broad in its emphasis and not exclusively tied to one core set of dimensions (e.g., "I feel good about myself"). Likewise, our social network activity manipulation was not overly specific and, instead, provided global information in the form of generic comments about the content (e.g., "Sounds cool!") and virtual approval (i.e., "Likes"). Thus, it could be that our social network activity manipulation had the biggest impact on state self-esteem due to them both being global. On the other hand, the relative self-evaluation measure and the personal user content manipulation were both specific in that they were related to particular dimensions that were related to the user content manipulation involving health behaviors (e.g., health, fitness, attractiveness). Thus, it could be that the user content manipulation had a relatively bigger impact (compared with the social network manipulation) on relative self-evaluations due to them both being specific to a particular context. Of course, all explanations for this set of results are speculative and contingent upon follow-up studies.

Implications

Our results have research-based and practical implications. In terms of research-based implications, our findings are among the first to explicitly examine social comparison processes and self-esteem in the context of social media and our results are consistent with those of past research showing that upward social comparisons can be detrimental (Brown et al., 1992;

Cash et al., 1983; Morse & Gergen, 1970; Pyszczynski et al., 1985; Thornton & Moore, 1993; Wheeler & Miyake, 1992), but demonstrated this in a novel social media-based context (see also Haferkamp & Kramer, 2011) that has been shown to be distinct from more general social comparison contexts (Feinstein et al., 2013). Additionally, our results build upon prior work that has indirectly examined social comparison in the context of social media. Dovel-tailing with and uniting these prior studies, our results replicate those of Chou and Edge (2012) by finding that people explicitly report a greater degree of upward than downward social comparisons via social media and extend their results by revealing that the net effect of making largely upward comparisons is harmful for self-esteem. Moreover, our results also provide a causal mechanism—exposure to upward social comparisons—for others' findings that frequent Facebook users have poorer well-being (e.g., Feinstein et al., 2013; Kalpidou et al., 2011; Kross et al., 2013; Mehdizadeh, 2010; Rutledge et al., 2013). Our work is among the first of its kind to *experimentally* examine the impact of social media-based comparisons on self-esteem (although see also Haferkamp & Kramer, 2011) and suggests, at least preliminarily, that social network activity plays a critical role in the oft-documented detrimental impact of social media on well-being. Finally, it is important to position our work within the context of other research showing that SNS use actually improves self-esteem (Gonzales & Hancock, 2011; Toma, 2013; Wilcox & Stephen, 2013). We suggest that these prior results do not necessarily contradict ours, as there are important methodological differences of note. Critically, in the research showing that SNS use improves self-esteem, participants primarily view their own (as opposed to other users') profiles or are told to focus on close others (rather than strangers or acquaintances; Wilcox & Stephen, 2013). Therefore, rather than being exposed to upward social comparisons, participants have the chance to bask in their *own* idealized versions of themselves through an examination of their recent history of thoughts, pictures, and interactions with close others, and see how far they have come in their lives (i.e., make positive temporal comparisons; Strahan & Wilson, 2006; Wilson & Ross, 2001).

Our results also highlight the practical implications of everyday social media use. Social media can be a wonderful tool, offering unprecedented access to information about a wide range of people and allowing unlimited networking possibilities. However, our data and others' (e.g., Andreassen, Torsheim, Brunborg, & Pallesen, 2012; Chou & Edge, 2012; Feinstein et al., 2013; Haferkamp & Kramer, 2011; Kalpidou et al., 2011; Mehdizadeh, 2010; Rutledge et al., 2013) highlight a potential downside to frequent social media use. As people are increasingly relying on SNSs for a variety of everyday tasks, they risk overexposure to upward social comparison information that may have a cumulative detrimental impact on well-being. Moreover, as prior research has shown that people with low self-esteem often use SNSs to express themselves in what they perceive to be a safe environment (Forest & Wood, 2012), this may result in a vicious cycle of using SNSs to receive social support but therein exposing themselves to upward social comparison information—impairing self-esteem and restarting the cycle.

Limitations

As with all research, there are limitations to the present set of studies. First, there are limitations for how the variables were operationalized across the two studies. For example, in Study 1 we assessed chronic exposure to social media-based social comparisons by assessing frequency of Facebook use. Although frequency of use is the most common way to assess Facebook use and is theoretically consistent with our research questions, other dimensions of Facebook use (e.g., intensity, number of friends) may also be important (Anderson, Fagan, Woodnut, & Chamorro-Premuzic, 2012). There are also potential limitations for our approach to manipulating user and social network content to create upward and downward social comparisons in Study 2. For instance, we exposed participants to only one social media profile, provided comparison information about a single and specific dimension (i.e., health), and used likes and brief comments to operationalize social network activity. Moreover, aspects of the way we operationalized these variables could account for why state self-esteem was not affected by the user content manipulation in Study

2. For example, perhaps this manipulation was not strong enough or involved a domain (i.e., health) that was not as important for our participants as intended. Moreover, it could also be argued that our downward comparison target was more neutral than negative on the health dimension.

Second, participants' extent of making upward and downward social comparisons on social media in Study 1 was assessed with a single item for each type of comparison. Critically, single-item measures can be prone to measurement error and may produce spurious findings. Moreover, it could be argued that measurement error from using single-item measures could be suppressing even larger relationships. In our study, participants' ratings of upward and downward comparisons on Facebook were highly related to one another ($r = .66$) and comparably related to the other key variables in the study (frequency of Facebook use, self-esteem; see Table 1). Although multi-item measures are desirable, we suggest that our use of single-item measures here does not invalidate our findings for two reasons. First, there are preestablished empirical and theoretical grounds to suggest that upward and downward social comparison processes and outcomes are distinct (Agthe, Sporrle, Frey, & Maner, 2014; Aspinwall & Taylor, 1993; Buunk, Zurriaga, Gonzalez-Roma, & Subirats, 2003; for reviews see Taylor & Lobel, 1989; Wills, 1981). Second, we suggest that the high correlation between upward and downward comparisons on social media is due to the fact that people who tend to use social media most are generally exposed to more information about *everyone* (which includes upward and downward comparison targets). Importantly, though, several results in our data suggest these constructs were nonetheless separable, including the fact that the overall rate of upward comparisons was higher than downward comparisons, and the fact that the mediation analysis showed that upward (but not downward) comparisons mediated the relationship between frequency of Facebook use and self-esteem.

Future Directions

In addition to addressing some of the limitations noted above, there are other logical directions for this line of research. First, SNSs are

used throughout the world by all types of people. Prior research has shown that the frequency and manner of use for SNSs depends upon various sociocultural and individual difference factors (e.g., Kim, Sohn, & Choi, 2011; Ryan & Xenos, 2011). For instance, collectivist societies (e.g., Japan) have more social contacts that they had never met in person than do users from individualistic nations (e.g., United States; Cardon et al., 2009), and motivations to use SNSs may differ depending upon the cultural context, such as when Arab youth use SNSs as a free speech platform (Al Omoush, Yaseen, & Alma'aitah, 2012). Therefore, future research investigating social comparison processes using more diverse samples would be welcome.

Second, our research represents just one approach for examining the links between social media, social comparison, and self-esteem. Other approaches to examining these issues would be useful. For example, researchers could have participants use their own SNS accounts (or engage in a control task) for a period of time in the lab prior to making self-evaluations, or use experience sampling to investigate longitudinal changes in self-esteem as a function of Facebook use and the social comparisons made therein (see Kross et al., 2013).

Third, SNS use is complex and dynamic. Users constantly update their profiles and respond to others' profiles, and such content may not always be as positive as we have primarily discussed and researched here (e.g., users describing a negative experience for sympathy, antagonistic network members; Valkenburg et al., 2006). Moreover, users have extensive and complex networks on SNSs, consisting of friends, acquaintances, coworkers, relationship partners, relatives, celebrities, and so on. In short, we have only scratched the surface of social comparison processes (and their consequences) on SNSs.

Conclusions

Our social world has been dramatically impacted by SNSs like Facebook. Our research represents a step toward understanding the implications of SNSs for social comparison processes and their consequences. Critically, our research suggests that the detrimental effects of frequent Facebook use on well-being are due to upward social comparisons on Facebook. Al-

though this and other work suggests that use of SNSs can have a deleterious effect on self-evaluations and well-being, we are, of course, not suggesting that such sites be avoided. Rather, as with most technology, there are rewards and costs to using SNSs and users should be mindful about the implications of such use.

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