

Who compares and despairs? The effect of social comparison orientation on social media use and its outcomes



Erin A. Vogel ^{a,*}, Jason P. Rose ^a, Bradley M. Okdie ^b, Katheryn Eckles ^a, Brittany Franz ^b

^a University of Toledo, Toledo, OH, USA

^b The Ohio State University at Newark, Newark, OH, USA

ARTICLE INFO

Article history:

Received 7 February 2015

Received in revised form 10 June 2015

Accepted 14 June 2015

Available online xxxx

Keywords:

Social comparison

Social media

Facebook

Social networks

Well-being

ABSTRACT

People vary in their tendencies to compare themselves to others, an individual difference variable called social comparison orientation (SCO). Social networking sites provide information about others that can be used for social comparison. The goal of the present set of studies was to explore the relationship between SCO, Facebook use, and negative psychological outcomes. Studies 1a and 1b used correlational approaches and showed that participants high (vs. low) in SCO exhibited heavier Facebook use. Study 2 used an experimental approach and revealed that participants high in SCO had poorer self-perceptions, lower self-esteem, and more negative affect balance than their low-SCO counterparts after engaging in brief social comparisons on Facebook. SCO did not have as strong or consistent effects for participants engaging in control tasks. Results are discussed in the context of extant literature and the impact of social media use on well-being.

© 2015 Elsevier Ltd. All rights reserved.

1. Introduction

In their daily interactions, people are afforded many opportunities to learn about others' opinions, abilities, and lives. Such social comparative information can be useful for a multitude of purposes, including self-evaluation (Festinger, 1954), self-enhancement (Gruder, 1971; Wills, 1981), and self-improvement (Lockwood & Kunda, 1997; for reviews see Buunk & Gibbons, 2007; Corcoran, Crusius, & Mussweiler, 2011; Wood, 1989). Importantly, people differ in their tendencies to engage in social comparison and in the psychological consequences incurred. Social comparison orientation (SCO) is a trait that reflects these individual differences (Gibbons & Buunk, 1999). Individuals high in SCO have a chronic sensitivity to and awareness of others, and experience more uncertainty and instability regarding their self-concepts (Buunk & Gibbons, 2006; Gibbons & Buunk, 1999). For the current research, we suggest that social media offers a novel medium in which social comparison can take place—and that people high in SCO might be more drawn to social media and more affected by the comparisons made therein.

1.1. Social media and social comparison opportunities

Social media use has become ubiquitous in many societies, with popular social network sites (SNSs) such as Facebook.com having 1.4 billion

active users worldwide (Facebook, 2015). SNSs not only allow users to maintain friendships, form new relationships, and connect with others (Boyd & Ellison, 2007; Manago, Taylor, & Greenfield, 2012), but also allow people to construct their own personal profiles and present a rich set of information about themselves (e.g., accomplishments, attitudes, activities, personalities, relationship status, daily habits, routines). Based on the rich information we can learn about others and the expansive network of people from which we can learn it (Acar, 2008), SNSs offer up an ideal platform for social comparison to take place. Indeed, it appears that people are quite interested in learning about others on SNSs, as most networking activity consists of browsing others' profiles without initiating social interaction (Joinson, 2008; Pempek, Yermolayeva, & Calvert, 2009). Moreover, people have indicated that they use SNSs for the purpose of making social comparisons, specifically while viewing others' posts and photos (Lee, 2014).

1.2. Consequences of social comparison on social media

It is clear that people use SNSs for the purpose of making social comparisons. But what differential consequences might online vs. offline social comparisons have for mental health and well-being? Critically, some research has found that online interactions and relationships on social media are different from those created offline (Ivcevic & Ambady, 2012). This may be attributed, in part, to the fact that people are better able to present themselves in a positive light online (Chou & Edge, 2012; Ellison, Heino, & Gibbs, 2006; Gonzales & Hancock, 2011). Indeed, there is a growing body of evidence to suggest that

* Corresponding author at: Department of Psychology, University of Toledo, Mail Stop #948, 2801 W. Bancroft Street, Toledo, OH 43606, USA.
E-mail address: erin.vogel@utoledo.edu (E.A. Vogel).

personal SNS profiles tend to present the self in a favorable light (e.g., Nadkarni & Hofmann, 2012; Rosenberg & Egbert, 2011). Importantly, if people selectively self-present positive aspects of their lives on social media, then social comparisons that are made using that biased information should differ from in-person social comparisons and involve mostly upward social comparisons to those who are better off on some dimension (Feinstein et al., 2013; Haferkamp & Kramer, 2011; Lee, 2014; Vogel, Rose, Roberts, & Eckles, 2014). Moreover, the consequences of exposure to upward comparisons should be quite negative. Indeed, empirical evidence suggests that both chronic and temporary upward social comparisons on social media have been associated with negative consequences, including changes in depression (Feinstein et al., 2013), self-esteem (Kalpidou, Costin, & Morris, 2011; Lee, 2014; Vogel et al., 2014), self-evaluations (Haferkamp & Kramer, 2011), and well-being (Kross et al., 2013).

1.3. Current research

In sum, we have two main points about the interface between social comparison and social media. First, because of the rich and varied information posted about others on social media, people should be quite interested in using social media for the purpose of social comparison. Second, because social comparison information tends to be upward (positive) on social media, it produces negative consequences for well-being and self-evaluation. Based on their strong sensitivity to and interest in others (Buunk & Gibbons, 2006; Gibbons & Buunk, 1999), we suggest that people high (vs. low) in social comparison orientation (SCO) should, 1) be more drawn to using social media because it offers abundant social comparison opportunities, and 2) be more negatively affected by the upward social comparisons made on social media. Consistent with both ideas, Lee (2014) found that high-SCO participants reported making more social comparisons on Facebook than low-SCO users. Although consistent with our general hypotheses, the results of the Lee (2014) study have limited applicability. First, Lee's result suggests that, once on social media, high-SCO participants report making more social comparisons; however, that study did not provide any evidence to suggest that high- and low-SCO participants differ in terms of how much and intensely they tend to use social media. Second, Lee did not document whether high- and low-SCO participants suffer differential consequences as a result of making social comparisons on social media. Our research addresses each of these issues directly and builds on the research by Lee (2014).

Study 1 addressed the first research question involving the relationship between SCO and social media use. College student participants were asked about their social comparison orientation (Gibbons & Buunk, 1999) and general social media use. We hypothesized that higher SCO scores would be associated with greater social media use (e.g., frequency, intensity, and involvement). Consistent with the finding of Lee (2014) that high-SCO participants report comparing more once on social media, we reasoned that those who chronically compare themselves to others are more likely to recognize the value of SNSs for social comparison and therefore use it more heavily.

Study 2 addressed the second research question by examining the differential effects of social comparison occurring on social media for people high and low in SCO. Participants were randomly assigned to one of three conditions in which they either browsed an acquaintance's social media profile (presumably engaging in social comparison) or performed control tasks. Afterwards, participants provided self-evaluations and rated their momentary self-esteem and affect. We hypothesized that, because information about others on social media tends to be positive, participants browsing an acquaintance's profile would have poorer self-evaluations, self-esteem, and affect than those participants in control conditions. However, most critically for our purposes, this was expected to be particularly true for participants high in SCO due to their sensitivity to comparison information.

2. Study 1

2.1. Overview

The main purpose of Study 1 was to examine the association between social comparison orientation and social media use. Facebook was chosen because it is the most popular and researched SNS, and most theoretically relevant to social comparison. College student participants were surveyed about their social comparison orientation and their social networking attitudes and habits. We conducted two studies (Studies 1a and 1b) in order to replicate our results across two distinct samples.

3. Study 1a

3.1. Method

3.1.1. Participants

Participants were 145 undergraduates (106 female) from a Midwestern university in the United States who received course credit for participating (M age = 19.65, SD = 2.87). 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).

3.1.2. Procedure and measures

Participants completed a series of questionnaires as part of a larger study involving social media use in college students.¹ All portions of the study were completed on computers in the lab using MediaLab software (Jarvis, 2008). After completing the questionnaires, participants were thanked and debriefed. Relevant measures for the present manuscript are described below.

3.1.3. Facebook use

To measure Facebook use, we assessed two related constructs: frequency of use and psychological involvement. First, to assess frequency of Facebook use, participants answered the following questions (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?" and "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). After standardization and upon confirmation that the items loaded onto a single factor, a "Frequency of Facebook Use" index was computed (α = .85). Second, to measure psychological involvement in Facebook, participants completed a 6-item measure (Andreassen, Torsheim, Brunborg, & Pallesen, 2012) designed to assess the extent to which Facebook use interferes with everyday life. Participants indicated their agreement with the items using a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). Sample items include "You spend a lot of time thinking about Facebook or planning how to use it" and "You use Facebook in order to forget about your personal problems" (M = 1.94, SD = .83, α = .86). The measures of frequency and involvement were strongly correlated (r = .65, p < .01) and showed strong reliability (α = .89). Therefore, they were standardized and combined into a composite Facebook use score.

3.1.4. Iowa–Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999)

To assess individual differences in SCO, we used the Iowa–Netherlands Comparison Orientation Measure (INCOM). Participants indicated their agreement with 11 statements on a 5-point Likert-type

¹ The data used in Study 1a were part of a larger study on social media use in college students. A portion of this data has been used elsewhere in a separate paper with different aims than the current paper: (Vogel et al., 2014).

scale (1 = *strongly disagree*, 5 = *strongly agree*). Sample items include, “I always pay a lot of attention to how I do things compared with how others do things” and “I never consider my situation in life relative to that of other people” (reverse-coded; $M = 3.34$, $SD = .61$, $\alpha = .77$).

3.2. Results and discussion

Our main hypothesis was supported. SCO was positively correlated with Facebook use ($r = .20$, $p = .02$). These results suggest that individuals who report being more likely to habitually compare themselves to others in everyday life also tend to engage in heavier Facebook use.²

4. Study 1b

4.1. Method

4.1.1. Participants

Participants were 275 undergraduate students (157 female) from the introductory psychology subject pool at a different large, Midwestern university who participated in exchange for course credit (M age = 18.70, $SD = 2.16$). The sample was 72.4% White, 15.3% Black, 2.5% Pacific Islander, 5.1% Hispanic/Latino, and 4.7% other race(s).

4.1.2. Procedure and measures

Participants came to the lab as part of a larger study that was purportedly concerned with Facebook use and person perception. In Study 1b, participants answered questions about their psychological involvement and intensity of Facebook use. First, psychological involvement in Facebook was assessed using the same scale described above in Study 1a (Andreassen et al., 2012; $M = 1.63$, $SD = .59$, $\alpha = .81$). Second, to measure intensity of Facebook use, we used the Facebook Intensity Scale (Ellison, Steinfield, & Lampe, 2007). Most relevant for our purposes were six items measured on a 1–5 Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*). Sample items include “Facebook is part of my everyday activity” and “I feel I am part of the Facebook community”. These items were averaged to create a variable that measures emotional connection with Facebook, or intensity of use (Kalpidou et al., 2011; $M = 2.68$, $SD = .90$, $\alpha = .87$). Intensity of Facebook use and involvement in Facebook use were strongly correlated ($r = .58$, $p < .001$) and showed strong reliability ($\alpha = .89$). Therefore, the two variables were standardized and a composite Facebook use score was computed. Finally, we used the same social comparison orientation measure used in Study 1a (Gibbons & Buunk, 1999; $M = 3.50$, $SD = .51$, $\alpha = .77$).

4.2. Results and discussion

The results of Study 1b replicated the pattern of results observed in Study 1a. Facebook use was positively correlated with SCO, $r = .16$, $p = .008$.³

5. Study 2

5.1. Overview

Having established in Study 1 that Facebook use tends to be heavier among those high in SCO, the goal of Study 2 was to examine whether the consequences of Facebook use for self-evaluation and affect differ for those high versus low in SCO. Participants were brought into the lab

and were randomly assigned to one of three conditions. In the experimental condition, participants browsed the Facebook profile of an acquaintance (presumably engaging in social comparison). In two control conditions, participants either browsed their own Facebook profile or read reviews of a consumer product (presumably not engaging in social comparison). Therefore, the two control conditions were included in order to parse out, 1) the effects of social comparison on Facebook from the effects of Facebook use in general, and 2) the effects of social comparison on Facebook from the effects of Internet use in general. Following these tasks, we assessed participants' affect and their self-evaluations in the form of their state self-esteem and trait self-perceptions.

As noted previously, Facebook users tend to present the best versions of themselves on their profiles (Manago, Graham, Greenfield, & Salimkhan, 2008; Rosenberg & Egbert, 2011; Zhao, Grasmuck, & Martin, 2008). Thus, given that the Facebook profiles of others tend to convey upward social comparison information (Chou & Edge, 2012; Ellison et al., 2006; Gonzales & Hancock, 2011; Nadkarni & Hofmann, 2012), we expected that participants would have poorer state self-esteem, trait self-perceptions, and affect after viewing an acquaintance's Facebook profile compared to both control conditions. Most important for our purposes, we expected SCO and condition to interact, such that participants high in SCO would be more negatively affected in the experimental condition when (upward) social comparison information was present. SCO was not expected to be a predictor of state self-esteem, trait self-perceptions, or affect in the control conditions because social comparison information was absent.

5.2. Method

5.2.1. Participants

Participants were 120 undergraduates (92 female) from the same university as Study 1a who participated in exchange for course credit (M age = 18.93, $SD = 3.94$). The sample was 65.8% White, 21.7% Black, 6.7% Asian, 0.8% Pacific Islander, 1.7% unknown race(s), and 3.3% two or more races.

5.2.2. Procedure, design, and measures

Participants came to the lab for a study on social media use in college students, and were randomly assigned to one of three conditions: Facebook Experimental, Facebook Control, or Non-Facebook Control. Participants in the Facebook Experimental condition chose a Facebook friend who was the same age/sex as them, went to the same high school, and who they would consider a casual friend or acquaintance. These instructions were intended to result in participants choosing a target who was both similar enough to encourage social comparison (Festinger, 1954; Wood, 1989) and distant enough that participants would rely on information gleaned from the profile rather than everyday life when making their evaluations (Chou & Edge, 2012). Participants viewed the acquaintance's Facebook profile for five minutes and evaluated the person's posting habits and personality traits from the profile content. Participants in the Facebook Control condition viewed their own Facebook profiles for five minutes, focusing on their status updates, comments from friends, and other profile content. Participants in the Non-Facebook Control condition performed an unrelated task on the Internet in which they read cell phones reviews for five minutes. Finally, all participants answered the same series of questions (described below).

5.2.3. Trait self-perceptions

Participants indicated their agreement with three sets of self-evaluative statements involving each of 11 traits (e.g., successful, popular, attractive, intelligent). For each item, participants were asked to compare themselves with the average student at their university of the same age/sex (1 = *much less* _____ *than the average student*, 5 = *much more* _____ *than the average student*), compare themselves in the present to themselves in high school (1 = *much less now than in*

² We also examined frequency of use and psychological involvement separately. Both constructs were positively correlated with SCO, although involvement appeared to be more strongly associated ($r = .20$, $p = .02$) than frequency ($r = .14$, $p = .09$). Importantly, though, there was no difference in correlation magnitude ($z = .52$, $p = .61$).

³ Again, we also examined intensity of use and psychological involvement separately. Both involvement ($r = .17$, $p = .005$) and intensity ($r = .12$, $p = .06$) were positively correlated with SCO and there was no difference in magnitude ($z = .59$, $p = .55$).

high school, 5 = much more now than in high school), and to evaluate themselves in general (e.g., “How _____ are you?”; 1 = Not at all, 5 = Very). Scores on the three scales were strongly correlated ($r_s > .44$, $p_s < .001$). Therefore, scores on each subscale were standardized and averaged to create a composite trait self-perception score ($\alpha = .90$).

5.2.4. State Self-Esteem Scale

To assess self-esteem following the experimental manipulation, we used the State Self-Esteem Scale (Heatherton & Polivy, 1991). Participants indicated their agreement with 20 statements on a 1–5 Likert-type scale (1 = not at all, 5 = extremely). Sample items include “I am worried about whether I am regarded as a success or failure” and “I feel displeased with myself” ($M = 3.43$, $SD = .51$, $\alpha = .90$).

5.2.5. Positive and Negative Affect Schedule (PANAS)

This 20-item scale (Watson, Clark, & Tellegen, 1988) was used to measure positive and negative mood states following the experimental manipulation. Participants indicated the extent to which they were currently experiencing each of 10 positive (e.g., determined, inspired) and negative (e.g., upset, depressed) mood states using a 1–5 Likert-type scale (1 = very slightly or not at all, 5 = extremely). A positive affect score ($M = 2.89$, $SD = .89$, $\alpha = .80$) and a negative affect score ($M = 1.41$, $SD = .48$, $\alpha = .67$) were computed for each participant. Affect balance, an overall mood score that accounts for both positive and negative affect, was then computed by subtracting the negative affect score from the positive affect score (Koydemir & Schutz, 2012; Liu, Wang & Lu, 2013). A score of 0 would indicate that the participant endorsed an equal intensity of positive and negative affective states; a positive score would indicate greater positive affect than negative affect, and a negative score would indicate greater negative affect than positive affect.

5.2.6. Iowa–Netherlands Comparison Orientation Measure (INCOM)

The INCOM (see Study 1) was again used to measure social comparison orientation ($M = 3.10$, $SD = .66$, $\alpha = .80$).⁴

5.2.7. Supplemental measures

To rule out that SCO impacted the types of acquaintances chosen, participants in the Facebook Experimental condition answered a series of supplemental questions about the acquaintance whose profile they viewed. Relevant items for the present manuscript include, “How similar do you feel to this person?” (1 = not at all, 5 = very), “How often do you view the profile of this person?” (1 = not at all, 5 = very often), and “How does this person compare to others his/her age/sex in terms of positive characteristics?” (1 = has fewer positive characteristics, 5 = has more positive characteristics). Importantly, SCO was not significantly correlated with perceived similarity to the target ($r = -.17$, $p = .29$), frequency of profile views ($r = -.22$, $p = .17$), or how positively the target was viewed relative to his/her peers ($r = -.03$, $p = .84$) suggesting that high- and low-SCO participants did not significantly vary in the types of acquaintances chosen for comparison.

5.3. Results and discussion

In order to analyze the effect of experimental condition and social comparison orientation on trait self-perceptions, state self-esteem, and affect balance, we submitted the dependent variables to hierarchical regression analyses. In Step 1, we regressed the relevant dependent

measure onto experimental condition. The experimental condition variable consisted of two dummy-coded variables that compared the Facebook Experimental condition to the two Control conditions (the Facebook Experimental condition was coded as “0” on both variables, the Facebook Control condition was coded as “1” on the first variable and “0” on the second, and the Non-Facebook Control condition was coded as “0” on the first variable and “1” on the second; Aiken & West, 1991). In Step 2, we regressed the relevant dependent measure onto SCO (standardized). In Step 3, the interaction terms between the dummy-coded variables and SCO were included in the model (Aiken & West, 1991). Results for each dependent variable are described separately below.

5.3.1. Trait self-perceptions

Step 1 of the model accounted for a non-significant 3% of the variance in trait self-perceptions ($R^2 = .03$, $F(2, 117) = 1.75$, $p = .18$). Indeed, the dummy coded variable comparing the Facebook Experimental condition to the Facebook Control condition ($M = .06$, $SD = .90$) was not significant ($\beta = .14$, $t = 1.34$, $p = .18$, $d = .28$), indicating no significant differences in trait self-perceptions between these two groups. There were also no significant differences in trait self-perceptions between the Non-Facebook Control condition ($M = .13$, $SD = .67$) and the Facebook Experimental condition ($M = -.20$, $SD = .94$; $\beta = .19$, $t = 1.80$, $p = .08$, $d = .40$).

Step 2 of the model accounted for a non-significant additional 2.5% of the variance in trait self-perceptions ($R^2\Delta = .03$, $F(1, 116) = 3.01$, $p = .09$). Indeed, there was no main effect of SCO on trait self-perceptions ($\beta = -.16$, $t = -1.74$, $p = .09$).

More important for our purposes was that Step 3 of the model accounted for a significant additional 10% of the variance in trait self-perceptions, above and beyond the main effects model ($R^2\Delta = .10$, $F[2, 114] = 6.76$, $p < .01$). Indeed, there were significant interactions between SCO and both dummy-coded variables comparing the Facebook Experimental condition against the Facebook Control condition ($\beta = .37$, $t = 3.03$, $p < .01$) and the Non-Facebook Control condition ($\beta = .46$, $t = 3.4$, $p < .01$). We hypothesized that SCO and condition would interact such that SCO would have a stronger effect on trait self-perceptions in the Facebook Experimental condition. Simple slopes were tested using the procedure outlined by Aiken and West (1991). Indeed, as expected, participants high in SCO who viewed an acquaintance's profile on Facebook had poorer trait self-perceptions than did participants low in SCO ($\beta = -.66$, $t = -4.02$, $p < .01$). However, SCO did not predict trait self-perceptions in the Facebook Control condition ($\beta = .03$, $t = .16$, $p = .88$) or the Non-Facebook Control condition ($\beta = .06$, $t = .42$, $p = .68$). Fig. 1 provides a visual representation of all 3 conditions at the mean of SCO as well as 1 standard deviation above and below the mean (Aiken & West, 1991).

5.3.2. State self-esteem

Step 1 of the model accounted for a non-significant 3% of the variance in state self-esteem ($R^2 = .03$, $F(2, 117) = 1.98$, $p = .14$). There were no significant differences in state self-esteem between the Facebook Experimental condition ($M = 3.25$, $SD = .77$) and the Facebook Control condition ($\beta = .19$, $t = 1.80$, $p = .08$; $M = 3.51$, $SD = .64$, $d = -.37$) or the Facebook Experimental condition and the Non-Facebook Control condition ($\beta = .17$, $t = 1.62$, $p = .11$; $M = 3.47$, $SD = .52$).

Step 2 of the model accounted for an additional and significant 8% of the variance in state self-esteem ($R^2\Delta = .08$, $F(1, 116) = 10.34$, $p < .01$). Indeed, participants high in SCO had lower state self-esteem than did participants low in SCO ($\beta = -.28$, $t = -3.22$, $p < .01$).

More important for our purposes and consistent with the trait self-perception data was that Step 3 of the model accounted for an additional and significant 5% of the variance in state self-esteem beyond the main effects model ($R^2\Delta = .05$, $F(2, 114) = 3.35$, $p = .04$). There was a significant interaction between SCO and the dummy-coded variable

⁴ The SCO measure always occurred at the end of the study and therefore may have been influenced by our manipulations. It may have been cleaner methodologically to assess SCO at the beginning of the study or in a prescreening study instead. That said, SCO is an individual difference that remains relatively stable (Gibbons & Buunk, 1999) and a one-way ANOVA showed that SCO scores were not significantly different between the Facebook Experimental, Facebook Control, and Non-Facebook Control groups, $F(2, 117) = .37$, $p = .69$.

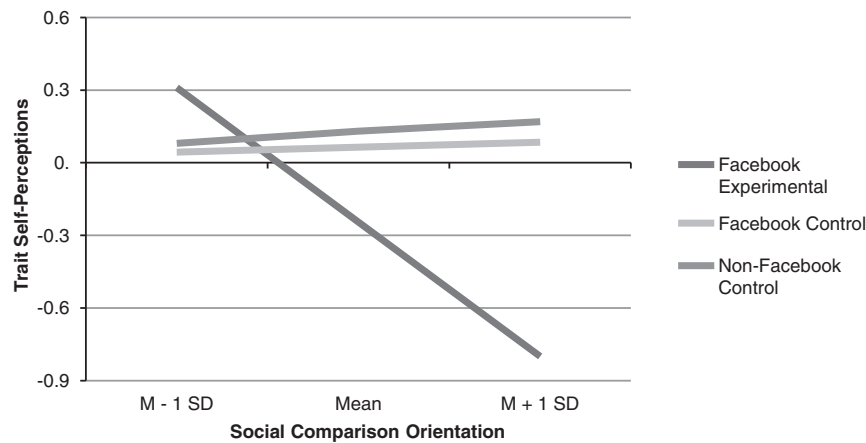


Fig. 1. Trait self-perceptions after viewing an acquaintance's Facebook profile (Facebook Experimental condition), viewing one's own profile (Facebook Control condition), or engaging in an unrelated task (Non-Facebook Control condition). Higher numbers reflect more positive ratings.

comparing the Facebook Experimental condition against the Facebook Control condition, $\beta = .32$, $t = 2.56$, $p = .01$. As expected, participants high in SCO had lower state self-esteem than did participants low in SCO in the Facebook Experimental condition, $\beta = -.57$, $t = -3.55$, $p < .01$. SCO did not predict state self-esteem in the Facebook Control condition ($\beta = .01$, $t = .07$, $p = .95$); however, high-SCO participants in the Non-Facebook Control condition also had lower state self-esteem than did low-SCO participants ($\beta = -.29$, $t = -2.20$, $p = .03$). Fig. 2 provides a visual representation of all 3 conditions at the mean of SCO as well as 1 standard deviation above and below the mean (Aiken & West, 1991).

5.3.3. Affect balance

Step 1 of the model accounted for a significant 8% of the variance in affect balance ($R^2 = .08$, $F(2, 117) = 4.84$, $p = .01$). There was a significant difference between the Facebook Experimental ($M = 1.39$, $SD = 1.04$) and Facebook Control ($M = 1.88$, $SD = .95$) conditions such that participants in the Facebook Control condition had more positive affect balance ($\beta = .23$, $t = 2.24$, $p = .03$, $d = .49$). There were no significant differences in affect balance between the Non-Facebook Control condition ($M = 1.23$, $SD = .85$) and the Facebook Experimental condition ($M = 1.39$, $SD = 1.04$, $\beta = -.08$, $t = -.79$, $p = .43$, $d = .17$).

Step 2 of the model accounted for a non-significant 0.2% of the variance in affect balance ($R^2\Delta = .002$, $F(1, 116) = 0.25$, $p = .62$). Indeed, there was no main effect of SCO on affect balance ($\beta = .05$, $t = .50$, $p = .62$).

More important for our purposes and consistent with the trait self-perceptions and state self-esteem data was that Step 3 of the model accounted for an additional and significant 9.2% of the variance in affect balance ($R^2\Delta = .09$, $F(2, 114) = 6.32$, $p = .003$). Indeed, there was a significant interaction between SCO and both dummy-coded variables comparing the Facebook Experimental condition against the Facebook Control condition ($\beta = .33$, $t = 2.73$, $p = .007$) and the Non-Facebook Control condition ($\beta = .46$, $t = 3.40$, $p = .001$). We hypothesized that SCO and condition would interact such that SCO would have a stronger effect on affect balance in the Facebook Experimental condition. Indeed, as we expected, participants high in SCO who compared themselves to others on Facebook had more negative affect balance than did participants low in SCO ($\beta = -.43$, $t = -2.70$, $p = .008$). SCO did not predict affect balance in the Facebook Control condition ($\beta = .18$, $t = 1.15$, $p = .25$). However, SCO did predict affect balance in the Non-Facebook Control condition such that participants high in SCO had more positive affect than did participants low in SCO ($\beta = .27$, $t = 2.07$, $p = .04$) (Fig. 3).

5.3.4. Summary

Taken together, the results across measures suggest a consistent influence of SCO on the effects of social media use. When examining an acquaintance's profile on Facebook, participants high in SCO had lower trait self-perceptions, lower state self-esteem, and more negative affect balance than did their low-SCO counterparts. Moreover, SCO was a weaker and inconsistent predictor of trait self-perceptions, state self-esteem, and affect balance for participants in the control conditions. Indeed, for the majority of measures and control conditions (4 out of 6

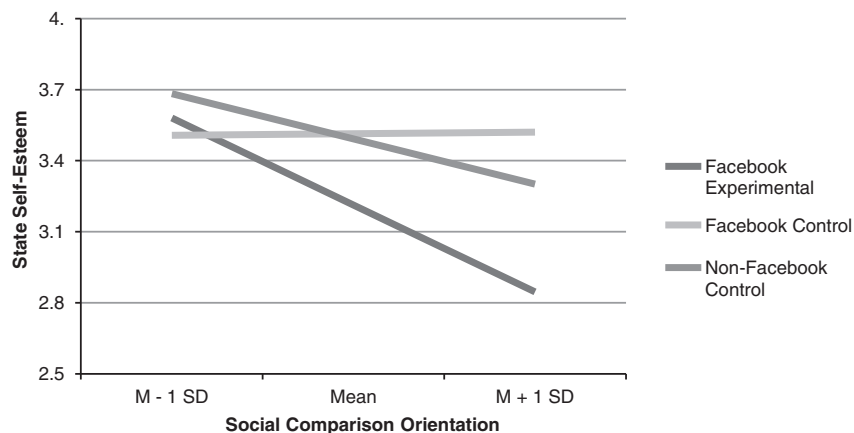


Fig. 2. State self-esteem after viewing an acquaintance's Facebook profile (Facebook Experimental condition), viewing one's own profile (Facebook Control condition), or engaging in an unrelated task (Non-Facebook Control condition). Higher numbers reflect higher self-esteem.

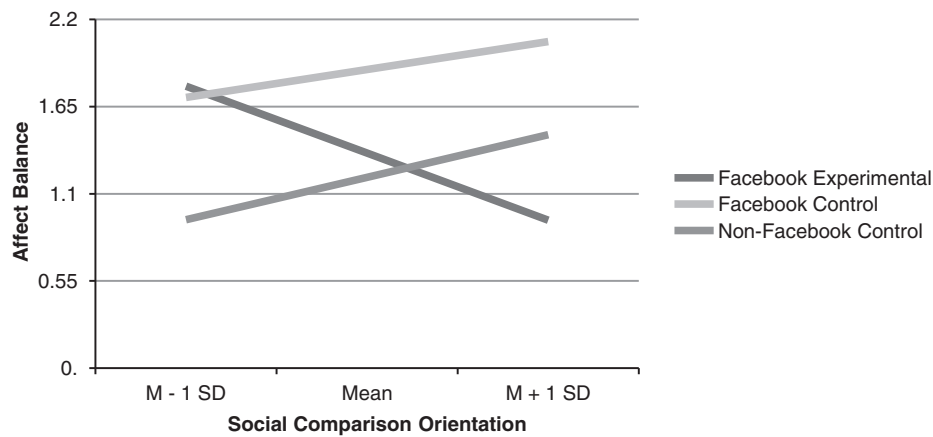


Fig. 3. Affect balance after viewing an acquaintance's Facebook profile (Facebook Experimental condition), viewing one's own profile (Facebook Control condition), or engaging in an unrelated task (Non-Facebook Control condition). Higher numbers reflect more positive and less negative affect.

analyses), SCO was not a significant predictor. The exceptions were that SCO did predict state self-esteem and affect balance in the Non-Facebook Control condition such that high-SCO participants had lower state self-esteem but more positive affect balance. The former result involving state self-esteem may reflect the general tendency of high-SCO individuals to have lower self-esteem (Gibbons & Buunk, 1999); the Facebook Control condition likely did not show this pattern because participants viewed their own profiles, which has been shown to temporarily increase self-esteem (Gonzales & Hancock, 2011). The latter result involving affect balance was not expected and appears to be inconsistent with the state self-esteem data. Overall, though, both results were less strong and consistent than our primary findings involving participants in the Facebook Experimental condition, and the measures furthest away from the manipulation showed the weakest overall pattern.

6. General discussion

The current research had two primary purposes: 1) to examine the relationship between SCO and Facebook use, and 2) to explore the differential effects of social comparison on Facebook for participants who differed in SCO. To fulfill the first goal, Study 1 surveyed participants about their general social comparison tendencies and Facebook use (e.g., frequency, intensity, psychological involvement). Results showed that participants high in SCO appear to use Facebook more heavily than participants low in SCO. This is consistent with prior research showing that high-SCO participants report making more social comparisons once on social media than low-SCO participants (Lee, 2014), but expand on this prior research by showing that high-SCO individuals spend more time on the SNS and are more invested in it. Moreover, this study lends preliminary support to the notion that high-SCO participants may implicitly recognize the abundant opportunities for social comparison available on social media and use social media often.

To examine the second goal, Study 2 used an experimental approach to determine whether participants high (vs. low) in SCO would be more impacted by social comparison on social media. Participants viewed an acquaintance's Facebook profile, viewed their own Facebook profile, or read product reviews and subsequently reported trait self-perceptions, state self-esteem, and affect. Results showed that participants high in SCO who viewed others' Facebook profiles (and thus had the opportunity to engage in social comparison on Facebook) reported poorer trait self-perceptions, lower state self-esteem, and poorer affect balance than participants low in SCO who also viewed others' Facebook profiles. In general, the same pattern of results did not hold for the control conditions, where SCO did not consistently and strongly predict trait self-perceptions, state self-esteem, and affect balance (see above for discussion of exceptions). The finding here that social media use has

deleterious consequences is consistent with prior research showing detriments in psychological well-being (Feinstein et al., 2013; Haferkamp & Kramer, 2011; Vogel et al., 2014), but builds on this prior research by using an experimental approach and by identifying SCO as an important moderator. One explanation for this result is that people high in SCO are more likely to make active social comparisons when exposed to social media (Lee, 2014). Another explanation is that people high in SCO may be more likely to internalize comparison-based content into the self (e.g., Buunk, Groothof, & Siero, 2007).

Overall, then, it is our contention that participants high (vs. low) in SCO both 1) seek out and use SNSs more heavily and 2) are more affected by the comparison-based content to which they are exposed. Taken at face value, this may appear to be an ironic or even contradictory collection of findings. That is, why would high-SCO individuals use Facebook more heavily than low-SCO individuals even though they experience more negative consequences? First, Facebook is a rich source of social comparison information and may therefore appeal to high-SCO users despite its negative consequences. People who are high in SCO are uncertain about themselves, (Buunk & Gibbons, 2007), and may use the information available on Facebook for self-evaluation. Second, high-SCO individuals may use Facebook for self-improvement. Self-improvement is a key purpose of social comparison, such that looking at upward comparison targets can provide motivation and inspiration (Lockwood & Kunda, 1997). Due to their general sensitivity to social comparison and its effects, people high in SCO may expect that, despite their negative emotions, seeing other people doing well will make them better. Third, the psychological impact of social comparison can often be implicit, affective, and difficult to detect or correct (Gilbert, Giesler, & Morris, 1995). Thus, it is possible that high-SCO users may not be able to fully detect that their heavy Facebook use is impairing their well-being.

6.1. Limitations and future directions

There are notable limitations to the current research. First, the association between SCO and Facebook use in Study 1 was based on cross-sectional design. Although individual differences are often deemed to be stable antecedents for behavior (e.g., Facebook use), future research could further measure the different facets of Facebook using techniques such as experience-sampling (see Kross et al., 2013) to gain a more complete and causal understanding of Facebook use among participants high and low in SCO.

Second, there are many ways to capture Facebook use. Frequency, intensity, and involvement were chosen to encompass a spectrum of definitions, from simple number of hours spent per week to psychological involvement in the SNS. However, researchers have employed other methods, such as quantity of social interaction (number of friends and

number of wall posts; Buffardi & Campbell, 2008) and number of visits per day (Mehdizadeh, 2010). Future research could employ additional definitions of Facebook use and examine their relationship with SCO. Moreover, even among the measures we chose for the current studies, there may be nuances among those variables in this context. Indeed, although we collapsed our measures and found that their individual correlations were of the same magnitude (see Footnotes 2 and 3), there were subtle differences between frequency, intensity, and involvement that suggest some degree of uniqueness.

Third, participants in Study 2 only browsed Facebook briefly in a lab setting; therefore, the real-world implications of the findings are unclear. However, due to the strong pattern of results after short-term exposure, we argue that long-term use has the potential to cause even greater consequences (e.g., see Feinstein et al., 2013; Kross et al., 2013). Nevertheless, longitudinal experimental research on Facebook use and social comparison would be informative.

Fourth, participants in Study 2 were asked to choose their own comparison target and always viewed an acquaintance's profile rather than that of a close friend. In terms of the former point, because participants chose their own acquaintances, it leaves open the possibility that the results involving SCO could be due to differences in the targets chosen by participants. However, as reported previously, our results suggest that this is not the case, as SCO was uncorrelated with critical target characteristics (e.g., perceived similarity to the target, relative positivity of target). Nevertheless, providing a standardized target for high- and low-SCO participants to view would be an interesting avenue for future research. Moreover, the content and valence of the target's profile could be manipulated to determine precisely what social comparison information affects participants negatively. For instance, future research could manipulate upward or downward comparison content to see whether, as previous research suggests, high-SCO individuals would also respond more negatively to downward comparisons than low-SCO individuals because they see comparison targets as a reflection of themselves (see Buunk & Gibbons, 2007 for a review). In relation to the latter point, prior research has shown that focusing on close friends while using Facebook is linked to increased self-esteem, possibly due to the fact that people present themselves positively on Facebook, which is likely to lead to highly valued positive appraisals from close friends (Wilcox & Stephen, 2013). Although much of Facebook activity involves acquaintances (Pempek et al., 2009), future research could benefit from including conditions that involve browsing close friends' profiles.

Lastly, we cannot be certain that participants who viewed acquaintances' profiles in Study 2 were actively engaging in social comparison because we did not directly assess this construct. This leaves open the possibility that a process other than social comparison was responsible for the differences between high- and low-SCO participants. However, we argue that social comparison is most likely the cause of these results for a few reasons. First, SCO reflects a person's sensitivities to and tendencies for making social comparisons. Thus, due to the nature of this construct, the finding that participants high in SCO have lower self-evaluations and well-being than participants low in SCO following exposure to an acquaintance on Facebook strongly suggests that the effect is driven by social comparison. Although SCO is certainly correlated with other constructs that could affect self-evaluations (such as neuroticism and self-esteem; Gibbons & Buunk, 1999), the only consistent SCO differences emerged in the experimental condition where social comparison information was present and not in control conditions where social comparison information was absent. Second, although a manipulation check could have been informative in determining whether participants recognize that they are engaging in social comparison, we suggest that a manipulation check may be ineffective in establishing that social comparison was occurring. Indeed, social comparison processes and effects can occur below the level of conscious awareness (e.g., Gilbert et al., 1995; Mussweiler, Ruter, & Epstude, 2004). Thus, participants may not be able to accurately report whether a comparison has been made or what influence it has had. In sum, although other

explanations for our results are possible, the data suggest that differences in social comparison drove our findings. Nevertheless, future research should utilize designs that can more firmly establish that social comparison processes can explain our results (e.g., standardization of comparison target, evaluation of profile content by experimenter). Moreover, even if we acknowledge that social comparison is occurring, we know very little about what specific content people are evaluating and how this impacts well-being (e.g., pictures, comments, friend activity). Future research could examine this issue as well.

6.2. Implications

These results have implications for several research literatures. First, they bolster prior findings and theories that suggest people high in SCO should be more interested in, and impacted by, social comparisons (Gibbons & Buunk, 1999; Buunk & Gibbons, 2006). In relation to the first point, we showed that high-SCO participants tend to be heavier users of SNSs, which we suggest offer an ideal platform for social comparison. In relation to the second point, we showed that participants high in SCO were more impacted by temporary exposure to social media than their low-SCO counterparts. Second, our results corroborate extant research suggesting that social comparison on social media leads to negative psychological outcomes such as depression (Feinstein et al., 2013), low self-esteem (Vogel et al., 2014) and poor self-evaluations (Haferkamp & Kramer, 2011). Our results suggest that the effects of Facebook use differ based on SCO, and that prior effects of this kind found in the literature may have been driven by people high in SCO.

These results also have practical implications for SNS use. Study 1 suggests that people high in SCO use Facebook more heavily than people low in SCO. These individuals are more vulnerable to the potentially detrimental consequences of social media use due to their sensitivity to social comparison information. Although SNSs can have many positive effects, such as promoting feelings of belongingness (Nadkarni & Hofmann, 2012), maintaining relationships (Ellison et al., 2007; Manago et al., 2012), and providing social support (Nabi, Prestin, & So, 2013), it is important to understand the different social and personality factors that determine when and for whom the detrimental effects of SNSs will be manifested.

References

- Acar, A. (2008). Antecedents and consequences of online social networking behavior: The case of Facebook. *Journal of Website Promotion*, 3, 62–83.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage Publications, Inc.
- Andreassen, C. S., Torsheim, T., Brunborg, G. S., & Pallesen, S. (2012). Development of a Facebook addiction scale. *Psychological Reports*, 110, 501–517.
- Boyd, D. M., & Ellison, N. B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13, 210–230.
- Buffardi, L. E., & Campbell, W. K. (2008). Narcissism and social networking web sites. *Personality and Social Psychology Bulletin*, 34, 1303–1314.
- Buunk, A. P., & Gibbons, F. X. (2006). Social comparison orientation: A new perspective on those who do and those who don't compare with others. In S. Guimond (Ed.), *Social comparison and social psychology: Understanding cognition, intergroup relations, and culture* (pp. 15–33). Cambridge: Cambridge University Press.
- Buunk, A. P., & Gibbons, F. X. (2007). Social comparison: The end of a theory and the emergence of a field. *Organizational Behavior and Human Decision Processes*, 102, 3–21.
- Buunk, A. P., Groothof, H. A. K., & Siero, F. W. (2007). Social comparison and satisfaction with one's social life. *Journal of Social and Personal Relationships*, 24, 197–205.
- Chou, H.-T. G., & Edge, N. (2012). "They are happier and having better lives than I am": The impact of using Facebook on perceptions of others' lives. *Cyberpsychology, Behavior and Social Networking*, 15, 117–121.
- Corcoran, K., Crusius, J., & Mussweiler, T. (2011). Social comparison: Motives, standards, and mechanisms. In D. Chadee (Ed.), *Theories in social psychology* (pp. 119–139). Oxford, UK: Wiley-Blackwell.
- Ellison, N., Heino, R., & Gibbs, J. (2006). Managing impressions online: Self-presentation processes in the online dating environment. *Journal of Computer-Mediated Communication*, 11, 415–441.
- Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends": Social capital and college students' use of online social network sites. *Journal of Computer-Mediated Communication*, 12, 1143–1168.
- Facebook (2015). Company info. Retrieved from <http://newsroom.fb.com/company-info>

- Feinstein, B. A., Hershenberg, R., Bhatia, V., Latack, J. A., Meuwly, N., & Davila, J. (2013). Negative social comparison on Facebook and depressive symptoms: Rumination as a mechanism. *Psychology of Popular Media Culture*, 2, 161–170.
- Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, 7, 117–140.
- Gibbons, F. X., & Buunk, B. P. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, 76, 129–142.
- Gilbert, D. T., Giesler, R. B., & Morris, K. A. (1995). When comparisons arise. *Journal of Personality and Social Psychology*, 69, 227–236.
- Gonzales, A. L., & Hancock, J. T. (2011). Mirror, mirror on my Facebook wall: Effects of exposure to Facebook on self-esteem. *Cyberpsychology, Behavior and Social Networking*, 14, 79–83.
- Gruder, C. L. (1971). Determinants of social comparison choices. *Journal of Experimental Social Psychology*, 7, 473–489.
- Haferkamp, N., & Kramer, N. C. (2011). Social comparison 2.0: Examining the effects of online profiles on social-networking sites. *Cyberpsychology, Behavior and Social Networking*, 14, 309–314.
- Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring self-esteem. *Journal of Personality and Social Psychology*, 60, 895–910.
- Ivcevic, Z., & Ambady, N. (2012). Personality impressions from identity claims on Facebook. *Psychology of Popular Media Culture*, 1, 38–45.
- Jarvis, B. G. (2008). *MediaLab (version 2012.4.118) [computer software]*. New York, NY: Empirisoft Corporation.
- Joinson, A. N. (2008). 'Looking at', 'looking up' or 'keeping up with' people? Motives and uses of Facebook. *Proceedings of the SIGCHI conference on human factors in computing systems* (pp. 1027–1036).
- Kalpidou, M., Costin, D., & Morris, J. (2011). The relationship between Facebook and the well-being of undergraduate college students. *Cyberpsychology, Behavior and Social Networking*, 14, 1783–189.
- Koydemir, S., & Schutz, A. (2012). Emotional intelligence predicts components of subjective well-being beyond personality: A two-country study using self- and informant reports. *The Journal of Positive Psychology*, 7, 107–118.
- Kross, E., Verduyn, P., Demiralp, E., Park, J., Seungjae Lee, D., Lin, N., et al. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS One*, 8, 1–6.
- Lee, S. Y. (2014). How do people compare themselves with others on social network sites? The case of Facebook. *Computers in Human Behavior*, 32, 253–260.
- Liu, Y., Wang, Z., & Lu, W. (2013). Resilience and affect balance as mediators between trait emotional intelligence and life satisfaction. *Personality and Individual Differences*, 54, 850–855.
- Lockwood, P., & Kunda, Z. (1997). Superstars and me: Predicting the impact of role models on the self. *Journal of Personality and Social Psychology*, 73, 91–103.
- Manago, A. M., Graham, M. B., Greenfield, P. M., & Salimkhan, G. (2008). Self-presentation and gender on MySpace. *Journal of Applied Developmental Psychology*, 29, 446–458.
- Manago, A. M., Taylor, T., & Greenfield, P. M. (2012). Me and my 400 friends: The anatomy of college students' Facebook networks, their communication patterns, and well-being. *Developmental Psychology*, 48, 369–380.
- Mehdizadeh, S. (2010). Self-presentation 2.0: Narcissism and self-esteem on Facebook. *Cyberpsychology, Behavior and Social Networking*, 13, 357–364.
- Mussweiler, T., Ruter, K., & Epstude, K. (2004). The man who wasn't there: Subliminal social comparison standards influence self-evaluation. *Journal of Experimental Social Psychology*, 40, 689–696.
- Nabi, R. L., Prestin, A., & So, J. (2013). Facebook friends with (health) benefits? Exploring social network use and perceptions of social support, stress, and well-being. *Cyberpsychology, Behavior and Social Networking*, 16, 721–727.
- Nadkarni, A., & Hofmann, S. G. (2012). Why do people use Facebook? *Personality and Individual Differences*, 52, 243–249.
- Pempek, T. A., Yermolayeva, Y. A., & Calvert, S. L. (2009). College students' social networking experiences on Facebook. *Journal of Applied Developmental Psychology*, 30, 227–238.
- Rosenberg, J., & Egbert, N. (2011). Online impression management: Personality traits and concerns for secondary goals as predictors of self-presentation tactics on Facebook. *Journal of Computer-Mediated Communication*, 17, 1–18.
- Rouis, S., Limayem, M., & Salehi-Sangari, E. (2011). Impact of Facebook usage on students' academic achievement: Roles of self-regulation and trust. *Electronic Journal of Research in Educational Psychology*, 9, 961–994.
- 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, 206–222.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scale. *Journal of Personality and Social Psychology*, 54, 1063–1070.
- Wilcox, K., & Stephen, A. T. (2013). Are close friends the enemy? Online social networks, self-esteem, and self-control. *Journal of Consumer Research*, 40, 90–103.
- Wills, T. A. (1981). Downward comparison principles in social psychology. *Psychological Bulletin*, 90, 245.
- Wood, J. V. (1989). Theory and research concerning social comparison of personal attributes. *Psychological Bulletin*, 106, 231–248.
- Zhao, S., Grasmuck, S., & Martin, J. (2008). Identity construction on Facebook: Digital empowerment in anchored relationships. *Computers in Human Behavior*, 24, 1816–1836.