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SEEING EVERYONE ELSE'S HIGHLIGHT REELS: HOW FACEBOOK USAGE IS LINKED TO DEPRESSIVE SYMPTOMS

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Two studies investigated how social comparison to peers through computer-mediated interactions on Facebook might impact users' psychological health. Study 1 (N = 180) revealed an association between time spent on Facebook and depressive symptoms for both genders. However, results demonstrated that making Facebook social comparisons mediated the link between time spent on Facebook and depressive symptoms for men only. Using a 14-day diary design (N = 152), Study 2 found that the relationship between the amount of time spent on Facebook and depressive symptoms was uniquely mediated by upward, nondirectional, and downward Facebook social comparisons. Similarly, all three types of Facebook social comparisons mediated the relationship between the number of Facebook logins and depressive symptoms. Unlike Study 1, gender did not moderate these associations. Both studies provide evidence that people feel depressed after spending a great deal of time on Facebook because they feel badly when comparing themselves to others.

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Comparison is the thief of joy.
Theodore Roosevelt

Over forty years ago, communication theorist Marshall McLuhan (1964) coined the phrase, "the medium is the message." He did not mean to imply that individuals should ignore messages communicated through a particular medium; but rather, people should not only be cognizant of a medium's obvious properties but also be aware of how it subtly influences culture. He argued that important technological advances have the potential to become extensions of the people using them and, in turn, may redefine human interactions. Moreover, McLuhan envisioned that technology would someday provide people with the tools to create a global village.

Thus, technological media has the power to organize societies, and can profoundly change interpersonal relationships for better or worse. For example, with more than a billion monthly active users worldwide (Facebook, 2012), the social networking site Facebook has brought McLuhan's idea of a global village to fruition, fundamentally altering the dynamics of human interaction. Prior research has tied Facebook use to positive effects such as fulfillment of ego needs (Toma & Hancock, 2013), greater subjective well-being (Kim & Lee, 2011), and higher relationship quality for those in a romantic relationship (Steers, Øverup, Brunson, & Acitelli, 2014). However, for some individuals the results of such cyber exchanges may be more dystopian than utopian.

For instance, internet addiction, which is defined as using the internet to an excessive degree, has been associated with depressive symptoms among young people as well as older adults (e.g., Morrison & Gore, 2010). Moreover, an analysis of 200 college students' Facebook status updates, a mechanism by which individuals often divulge information en masse to their Facebook friends, revealed that 25% of the Facebook profiles evidenced depressive symptoms through their status updates over the past year (although only 2.5% exhibited major depressive episode criteria; Moreno et al., 2011). Another study surveyed 425 Facebook users and found that individuals who possessed a Facebook account over a longer period (i.e., for several years) tended to perceive that others are happier and life is unfair (Chou & Edge, 2012). Moreover, individuals who spent more hours per week and those who befriended strangers were more likely to believe that others on Facebook had better lives than they did. Finally, a related study found that people tend to

underestimate others' negative emotions, which often leads to emotional pluralistic ignorance (Jordan, Monin, Dweck, Lovett, John, & Gross, 2011). That is, those afflicted with emotional difficulties may fail to recognize others' internal struggles, which may compound feelings of loneliness and isolation. The researchers reasoned that this occurs because people publically portray themselves as being happier than they actually are (Jordan et al., 2011).

The present work builds on these established findings by examining the extent to which spending time on Facebook encourages individuals to compare their lives to others'. If people portray themselves as happier than they actually are, then perceptions of the happiness and well-being of one's Facebook friends are likely to be distorted. However, the underlying mechanism behind what motivates individuals on Facebook to make such comparisons and how this relates to their sense of well-being has yet to be elucidated. In our proposed model, increased social comparisons stemming from spending time on Facebook leads to greater depressive symptomology among users.

SOCIAL COMPARISON

Social comparisons occur when people automatically contrast themselves with others on abilities or attributes they deem important. Leon Festinger (1954) first theorized that individuals have an innate desire to socially compare themselves to others as a way to evaluate their own opinions and abilities and that people usually selectively choose whom to compare themselves to on the basis of perceived similarity. That is, people tend to compare themselves to peers or friends on self-relevant issues or concepts.

Prior work has established a relationship between social comparisons and mental well-being in normal populations (e.g., Gilbert, Allan, Brough, Melley, & Miles, 2002; Troop, Allan, Treasure, & Katzman, 2003). Specifically, research has found that making upward social comparisons, seeing oneself as inferior to others, are associated with negative health outcomes, such as greater depressive symptoms, lower self-esteem, and negative self-evaluations (i.e., Allan & Gilbert, 1995; Tesser, Millar, & Moore, 2000). Conversely, downward social comparisons, seeing oneself as better off than or superior to others, has been commonly associated with positive health outcomes such as less anxiety, positive self-esteem, and

greater positive affect (e.g., Allan & Gilbert, 1995; Amoroso & Walters, 1969; Wills, 1981).

However, other literature suggests that the relationships between social comparison, affective responses, and, consequently, well-being, may be more complex than simply being inherent to the direction of the social comparison. For instance, Buunk, Taylor, Dakof, Collins, and VanYperen (1990) found evidence that individual differences such as self-esteem, perceived control over circumstances, and feelings of dissatisfaction, may moderate whether individuals feel positive or negative affect following upward or downward social comparisons. In recent years, researchers have expanded upon the idea that affective responses may be independent of direction of social comparison by suggesting that it is the *act of frequently socially comparing oneself to others* rather than the *direction of social comparison* that is related to long-term destructive emotions (White, Langer, Yariv, & Welch, 2006). Thus, any benefits gained from making social comparisons may be temporary whereas engaging in frequent social comparisons of *any kind* may be linked to lower well-being.

GENDER AND SOCIAL COMPARISON

Research has also indicated that there are gender differences in social comparison at both an individual and group level. In their studies on uniqueness bias, Goethals, Messick, and Allison (1991) consistently found that males differentiated themselves from others more often than females. That is, men believed they were more intelligent, athletic, creative, and smarter than others. Conversely, women viewed themselves as at the same or below others on most levels. Women only tended to exhibit self-other differentiation on moral behaviors.

In addition, the literature has consistently demonstrated that, due to perceived similarity, individuals prefer same-sex social comparisons (e.g., Major & Forcey, 1985; Suls, Gaes, & Gastorf, 1979) and that the genders experience differing effects as a result of their comparisons. Researchers found that men reported lower self-esteem when engaging in upward social comparison with other males. However, women reported lower self-esteem when making upward social comparisons with males, but not with other females (Martinot, Redersdorff, Guimond, & Dif, 2002). There were two primary reasons for this phenomenon: females viewed themselves as subordinate

to males, which negatively impacted their self-esteem, and women protected their self-esteem when making upward social comparisons with other females by considering them part of their ingroup (Martinot & Redersdorff , 2003). Researchers found that men experienced lower levels of self-esteem only when engaging in upward social comparisons with women in traditionally female-oriented domains (Redersdorff, 2002).

FACEBOOK SOCIAL COMPARISON

Although social comparison processes have been examined at length in traditional contexts (i.e., face-to-face), to our knowledge, the literature has yet to examine social comparison in online social networking settings. However, this may be an important avenue to explore due to the fact that online interactions, specifically those on the popular social networking site, Facebook, would likely involve social comparisons that may be associated with health outcomes. Facebook users spend over 700 billion minutes per month on Facebook (Facebook, 2010). In fact, a recent report estimated that members devote an overwhelming 16 percent of their total internet time to Facebook-related activities in the U.S. alone (Davis & Angelova, 2011). Thus, an investigation is needed to better understand how Facebook activities relate to well-being.

After logging on, Facebook users are exposed to a continual stream of information (i.e., status updates, viewing newly uploaded pictures, friends posting on each other's walls, liking of other people's status updates). Thus, these Facebook activities may serve as stimuli for individuals to automatically engage in frequent nondirectional, upward, and/or lateral social comparisons, especially for those who spend longer amounts of time/frequently view Facebook. Because the Facebook platform promotes self-disclosure, users may reveal highly personal information, which they normally would not divulge (Gross & Acquisti, 2005). Therefore, Facebook users are often privy to information about their Facebook friends that they might not have known otherwise.

More generally, an individual may engage in social comparisons on Facebook by comparing the number of likes or comments other people have posted to their status updates relative to their peers. However, individuals may also make specific social comparisons after viewing a particular friend's pictures or status updates. For

example, a recent divorcée might feel worse about being single after seeing an acquaintance's recent engagement photos posted on Facebook (upward social comparison). People might also engage in social comparisons on Facebook in order to feel better about themselves. For instance, a man may temporarily feel more confident after reading a status update about his friend's failing grade on an exam for which he earned an "A" (downward social comparison).

Users are often unable to anticipate what their friends will post. Thus, they often cannot control what they will the view when they log on or what will information will serve as the impetus for them to make social comparisons. However, we hypothesize that more time spent on Facebook will provide Facebook users with greater opportunities to socially compare themselves to their friends.

THE CURRENT RESEARCH

Previous research has demonstrated that people's goals, motives, and interests often remain the same whether the interactions are made online or face-to-face (Mckenna & Bargh, 2000). Thus, the goal of comparing oneself to others may be just as strong whether one is on Facebook or interacting face-to-face. Across two studies, we tested the primary hypothesis that social comparisons on Facebook would mediate the association between time on Facebook and depressive symptoms.

Study 1 used a cross-sectional design to examine whether making nondirectional Facebook social comparisons, defined as asking people whether they compare themselves to others rather than in which direction, mediated the relationship between Facebook usage and depressive symptomology. To further investigate the proposed mediation model, a daily diary design was employed in Study 2. Moreover, Study 2 examined different types of social comparison (upward, downward, and nondirectional) as potential mediators of the relationship between time on Facebook and depressive symptoms. We further explored whether these three types of Facebook social comparisons would also serve as mediators between number of Facebook logins (how many times people view Facebook per day as opposed to length of time) and depressive symptoms. We hypothesized that Facebook logins might function similarly to Facebook time. In addition, because previous studies have found gender differences in social comparison (e.g., Goethals et al., 1991;

Martinot et al., 2002) and women are more than twice as likely to be depressed as men (i.e., Piccinelli & Wilkinson, 2000), we examined gender as a potential moderator of the relationship between Facebook social comparisons and depressive symptoms across both studies (moderated mediation).

STUDY 1

We predicted that active Facebook users would be higher in general social comparison orientations because they have more opportunities to compare themselves to their friends than nonactive or non-Facebook users. Thus, we first considered the possibility that active Facebook users would be significantly higher in general social comparison orientations than nonactive Facebook users or individuals who do not have a Facebook account. That is, active Facebook users would be more likely to engage in social comparisons (on and offline) than nonactive Facebook users or individuals who do not have a Facebook account (H1).

Previous research has demonstrated that Facebook use or excessive internet use predicted depression (Moreno et al., 2011; Morrison & Gore, 2010). Hence, we hypothesized that time on Facebook would be positively associated with depressive symptoms (H2). Moreover, the amount of time on Facebook was expected to be positively related to nondirectional Facebook social comparison, such that, the more time an individual spends on Facebook the more he or she is likely to socially compare (H3). Additionally, we anticipated that nondirectional Facebook social comparisons would serve as a mediator between time on Facebook and depressive symptoms (H4). Finally, we explored gender as a moderator of the relationship between nondirectional Facebook social comparisons and depressive symptoms (H5).

METHOD

Participants

Study 1 was conducted with 180 students (39 males, 141 females) from a large southwestern university. Having a Facebook account was not a prerequisite; however, most participants did have an account (92%). Participants were ethnically diverse (17% African

American, 17% Asian American, 26% Hispanic, 32% Caucasian, 3% Middle Eastern, 4% Multiracial, and 1% Native American) and ranged in age from 19 to 57 years (M = 24.41, SD = 5.88). Participants who reported having a Facebook account were asked if they considered themselves to be active Facebook users. An active Facebook user was defined as someone who checks his or her Facebook account on a regular basis. If a participant rarely checked their Facebook account, had deactivated their account, and/or did not regard themselves an active member, they were considered a nonactive Facebook user. There were 133 active users (26 males, 107 females), 33 nonactive Facebook users (7 males, 26 females), and 14 participants who did not have a Facebook account (6 males, 8 females). Because of the small sample size, those who did not have a Facebook account were combined with nonactive Facebook users (47 nonactive Facebook users).

Procedure

Participants were recruited from undergraduate psychology classes and were told the study would be exploring internet use and personality. Respondents accessed the online questionnaire via a research website and were asked to complete demographic information, social comparison measures, and depressive symptomology measures. In addition, active Facebook users were directed to Facebook-related questions (i.e., average amount of time per day they spent on Facebook) and measures adapted for Facebook use. Upon successful completion, participants were compensated with extra credit.

MEASURES

Social Comparison. General social comparisons were measured through the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). The INCOM gauges participants' tendencies to socially compare themselves to others using 11 items (e.g., I always pay a lot of attention to how I do things compared with how others do things) on a 5-point Likert scale, ranging from 1 (I disagree strongly), to 5 (I agree strongly; α = .86).

In addition, we adapted the Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999) to a Facebook context (nondirectional COM-F) to determine social comparison tendencies

on Facebook (e.g., When I am on Facebook, I always pay a lot of attention to how well I have done something compared to how others do things.). As previously mentioned, the measure is nondirectional in that it does not measure whether people are engaging in upward or downward social comparison, but simply asks people whether they compare themselves to others on a 5-point Likert scale (α = .85).

Depressive Symptomology. Depressive symptoms were measured by the Center for Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D was developed to diagnose depressive symptoms in normal populations using 20 self-report items (e.g., I felt like I could not shake off the blues even with help from my family or friends). Participants report on how they have felt during the past week and the scale is rated on a scale of 0 (Rarely or none of the time; less than 1 day) to 3 (Most or all of the time; 5–7days). Scores are summed and total possible scores ranging between 0-60. Higher scores indicate more depressive symptoms (α = .93).

Time on Facebook. The amount of time participants spent on Facebook was assessed through one item which asked participants, "How long on average do you spend per day on Facebook?" Respondents could choose from the following response choices: Less than 5 minutes, From 5–30 minutes, From 30 minutes-1 hour, Between 1–2 hours, Between 2–3 hours, Between 3–4 hours, and 4+ hours.

RESULTS AND DISCUSSION

Means, standard deviations, and zero-order correlations for Study 1 are presented in Table 1. Women scored over 14 on average on the CES-D, indicating normal levels of depressive symptoms; however, the average CES-D for men exceeded the clinical threshold indicating a mild level of depressive symptoms (Ensel, 1986; Zich, Attkisson, & Greenfield, 1990).

An independent samples *t*-test revealed no significant differences between active Facebook users (M = 36.55, SD = 7.40) and nonactive Facebook users (M = 34.77, SD = 8.21); t (178) = 1.32, p = .19, d = .23 on the general measure of social comparison (INCOM) were found. Thus, H1 was not supported. This finding may suggest that that people do not compare themselves to others more in online con-

TABLE 1. Correlations Among Study 1 Major Variables

		1	2	3	4
1. Time on Facebook		—	.15	.22	.57**
2. General Social Comparison (INCOM)		.22	—	.60**	.51**
3. Non-directional COM-F		.51**	.63**	—	.61**
4. Depressive Symptomology (CESD)		.32**	.04	.07	—
Mean (*SD*)	Males	3.46 (1.44)	33.62 (6.97)	28.85 (8.74)	16.54 (12.45)
Mean (*SD*)	Females	3.36 (1.59)	30.94 (9.12)	30.94 (9.12)	14.55 (10.89)

Note. Correlations for Females (N = 107) are presented below the diagonal. Correlations for Males (N = 26) are presented above the diagonal. * $p < .05$; ** $p < .01$.

texts, relative to face-to-face interactions. However, due to the fact that we do not know the full scope of participants' online behaviors and that other potential confounds may exist, this interpretation should be viewed with caution. Additionally, no significant differences were observed between male (M = 3.46, SD = 1.77) and female (M = 3.36, SD = 1.58); t (35) = .28, p = .76, d = .06 participants for the total amount of time spent on Facebook.

The moderated mediation hypotheses (H2–H5) were examined using multiple group path analysis in *Mplus* (Muthén & Muthén, 2012). Moreover, the *ab* products method described by MacKinnon and colleagues (Mackinnon, Fairchild, & Fritz, 2007; MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), along with bootstrapped confidence intervals for the indirect effects (Shrout & Bolger, 2002) were used to test the significance of the mediated effects. Figure 1 displays the results for the analysis of H2-H5.

Our analysis revealed that time on Facebook was positively related to depressive symptoms for both males (β = .36, $p < .01$) and females (β = .32, $p < .01$) (H2). Furthermore, time on Facebook was positively related to nondirectional COM-F for males (β = .51, $p <$ .01) and (β = .22, $p < .05$) for females (H3). Thus, there was evidence to support H2 and H3. However, nondirectional COM-F was only significantly related to depressive symptoms scores for males (β = .43, $p < .01$), whereas it was not significant for females (β = .00, p =.986). Hence, the b path was significant for males only. The test of the indirect effects showed that the mediated effect of nondirectional COM-F on the relationship between time on Facebook and depressive symptoms was significant for males (β = .219, 95% CI: .026, .413; $p < .05$) but not for females (β = .00, 95% CI: -.046, .045, p =.986; H4). Consistent with expectations, nondirectional COM-F served as

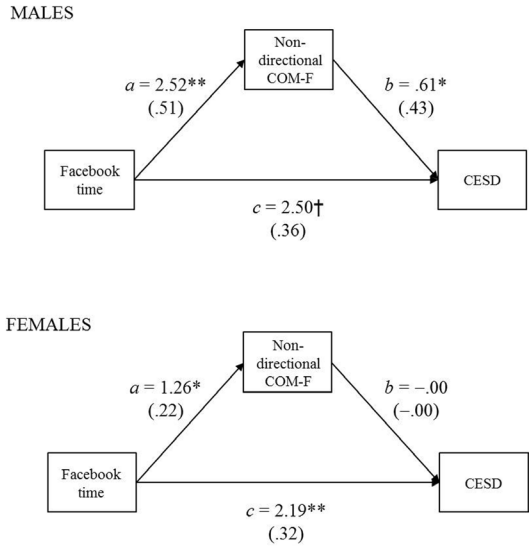

FIGURE 1. Mediational Model for Study 1.
Note. †$p < .10$; *$p < .05$; **$p < .01$.

a mediator between time on Facebook and depressive symptoms for males only (H5).

Equality constraints were imposed for men's and women's *a*-paths (i.e., $a_{Men} = a_{Women}$) and *b*-paths (i.e., $b_{Men} = b_{Women}$), and Chi-square difference tests revealed that the *a*-path between time on Facebook and COM-F was not significantly different for men and women, $\chi^2(1, 133) = 1.62$, $p = 0.20$. However, the *b*-path between nondirectional COM-F and depressive symptoms was significantly different for men and women $\chi^2(1, 133) = 5.42$, $p < 0.05$. These findings suggest that spending more time on Facebook is associated with greater Facebook social comparison, which in turn predicts greater depressive symptoms, but only among men (H4 and H5).

A previous study found that men were significantly more likely than women to use these social networking sites for dating purposes (Raacke & Bonds-Raacke, 2008). Thus, from an evolutionary perspective, it is possible that the more time men spend on Facebook the more likely they are to compete with other males (possibly for mates) and feel inadequate after comparing themselves to their peers. Time spent on Facebook did not predict women's outcomes in the same way. We reasoned that women might use Facebook as

a way to maintain connections with friends or to bond with other women rather than compete with them.

On the other hand, perhaps depressed individuals spend more time on Facebook and consequently, make more social comparisons. We examined the plausibility of this alternative interpretation and found the mediated effect was not significant for either gender. Specifically, the *a*-path leading from depressive symptoms to social comparisons was significant for among men ($p < .01$), but not women ($p = .48$). However, the *b*-path leading from depressive symptoms to time on Facebook was nonsignificant for men ($p = .15$), but significant among women ($p < .05$). As a result, the bootstrapped CIs for the indirect effect contained zero (i.e., nonsignificant) for both genders. Although no parametric test is available to compare the fit of these models, the presence of a significant indirect effect (among men) in the hypothesized direction, but not in the opposite direction, provides additional support for our process model. The next study uses a diary design to provide further evidence that exposure to social media leads to increased social comparisons, and in turn greater depressive symptoms.

STUDY 2

In study 2, we conducted a 14-day interval-contingent diary focusing solely on Facebook users in order to gauge a more accurate assessment of how much time participants spend on Facebook and what types of social comparisons they make. This approach limits bias that can occur through the administration of global cross-sectional measures and provides greater statistical power. In addition to the nondirectional COM-F measure, Study 2 contained questions adapted from the INCOM to measure upward and downward social comparison (upward COM-F and downward COM-F, respectively). Participants filled out short questionnaires each night.

STUDY 2 HYPOTHESES

The previous hypotheses (H2–H5) regarding time on Facebook in Study 1 were retained and comprise the first four hypothesis of Study 2 (H1–H4). All analyses were conducted at the within-persons level. However, Study 2 provides a more rigorous test of the

TABLE 2. Within-Persons Correlations Among Study 2 Major Variables

	1	2	3	4	5	6
1. Time on Facebook	—	.50**	.06†	.15**	–.12**	–.01
2. Facebook Logins	.43**	—	.04	.11**	–.10**	–.06
3. Upward COM-F	.11**	.08**	—	.37**	–.35**	.16**
4. Non-directional COM-F	.20**	.08**	.36**	—	–.49**	.08*
5. Downward COM-F	–.15**	–.08**	–.25**	–.57**	—	.07*
6. Depressive Symptomology (CESD)	.02	-.01	.24**	.06*	.06†	—
Mean (*SD*) Males	4.01 (1.42)	6.39 (3.65)	4.67 (2.13)	4.81 (2.61)	14.29 (2.66)	13.98 (5.77)
Mean (*SD*) Females	3.97 (1.54)	6.81 (4.27)	4.67 (2.49)	4.97 (2.88)	13.91 (2.88)	14.47 (6.84)

Note. Correlations for Females ($N = 93$) are presented below the diagonal. Correlations for Males ($N = 59$) are presented above the diagonal. $^{\dagger}p < .10$; $^{*}p < .05$; $^{**}p < .01$.

previous mediation hypothesis by simultaneously examining the different types of social comparison (upward, downward, and non-directional COM-F) since all three types of social comparison were significantly correlated with one another (see Table 2). Furthermore, we assessed Facebook activities using both the amount of time spent on Facebook, and the number of Facebook logins each day.

Hypotheses 5–8 mirror the first four hypotheses for Study 2, but with frequency of logins as the predictor, rather than amount of time spent on Facebook. We theorized that frequency of logins might function as a proxy for time on Facebook. Based on the results from Study 1 and evidence suggesting that individuals who frequently engage in social comparisons experience negative consequences (White, Langer, Yariv, & Welch, 2006), we expected that all three types of social comparison (upward, downward, or nondirectional) would serve as a significant mediator in both mediational models.

Predictions for Facebook logins were as follows. We hypothesized that participants' daily frequencies of logins would be positively associated with daily depressive symptoms (H5). Moreover, daily frequencies of logins were expected to be positively related to daily Facebook social comparisons (H6). Additionally, we expected daily Facebook social comparisons would mediate the association between daily frequency of logins and daily depressive symptoms (H7). Finally, we explored gender as a moderator of the relationship between Facebook social comparisons and depressive symptoms (H8).

METHOD

Participants

In total, 154 individuals (95 female, 59 male) from a large southwestern university completed 2,035 of the 2,156 possible diary entries (94% completion rate) across the fourteen days. Participants ranged in age from 18 to 42 years old (M = 22.55, SD = 4.22) and the sample was again ethnically diverse (15% African American, 22% Asian Americans, 31% Hispanic, 25% Caucasian, 2% Middle Eastern, 4% Multiracial, and 1% Native American). Only students 18 years or older who logged into their Facebook account on a daily basis were eligible.

Procedure

Study 2 consisted of two phases. During phase 1, participants completed a questionnaire containing demographic information and attended an orientation session designed to familiarize them with the diary procedure. Phase 2 consisted of an interval-contingent diary report which was completed for 14 days following orientation. During orientation, a trained research assistant reviewed the diary form with participants and explained that one diary record was to be completed online each night before bed. If they failed to complete an entry at night, participants were instructed to complete the survey the following morning. Participants without internet access on a given night were instructed to fill out hard copies.

Furthermore, during orientation, special emphasis was placed upon clarifying the open-ended question pertaining to Facebook logins. Additionally, participants were advised to consider only the amount of time they were actively viewing Facebook when estimating their total amount of time spent on Facebook. Upon successful completion, participants were compensated with extra credit.

Measures

Participants responded to the following items each night of the 14-day diary collection phase.

Facebook Time/Logins. Participants reported on the number of times they logged onto Facebook using an open-ended format (i.e.,

How many times did you check your Facebook account today?). Participants were instructed to consider any time they clicked on Facebook and/or read an automated e-mail/text/smartphone alert from Facebook as a view. If they ignored the automated e-mail/text/smartphone alert from Facebook or kept Facebook running on their browser but did not look at it, this was not considered a view. As in Study 1, participants were asked to estimate approximately how long they spent on Facebook during the day using the following response choices: Less than 5 minutes, 5–15 minutes, 16–29 minutes, 30 minutes to an hour, Between 1–1½ hours, Between 1½–2 hours, Between 2–2½ hours, Between 2½–3 hours, Between 3–3½ hours, Between 3½–4 hours, Between 4–4½ hours, Between 4½–5 hours, and Between 5+hours.

Facebook Social Comparison. Six items from the Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999) were adapted to measure nondirectional, downward, and upward social comparisons on Facebook. All items contained the common stem: "TODAY, when I was on Facebook…." Upward social comparison items included: "… I felt less confident about what I have achieved compared to other people," and "… I concluded I am not as popular as other people." Nondirectional items included: "…I paid a lot of attention to how I do things compared to how others do things," and "… if I wanted to find out how well I have done something, I compared what I have done with how well others have done." Finally, downward social comparison items included: "…I paid attention to how I do things versus how others do things and felt my way was better," and "… I believed that I had accomplished more than other people had." All items were measured on a 9-point Likert scale ranging from I disagree strongly to I agree strongly.

Depressive Symptomology. To minimize participant burden, depressive symptoms were measured using a subset of five items from the CES-D (Radloff, 1977). An exploratory factor analysis of Study 1 data revealed the strongest loadings for items 3, 6, 8, 12, and 18, which led us to include these items in the diary portion of Study 2. Participants responded to these items using a 9-point Likert scale items ranging from none of the time today to most of the time today, and item responses were summed to create a total score ranging from 5 to 45 ($\alpha = .86$).

Analysis Strategy

In Study 2, we examined a mediational model based on daily diary (level 1) responses. The *a*-paths in our mediational model describe the association between daily Facebook usage, operationalized by login frequency or amount of active time spent on Facebook, and three forms of social comparison: upward, nondirectional, and downward. Because the experience sampling (diary) method produces a hierarchical data structure with daily diary responses nested within individuals, multilevel modeling can be used to account for the non-independence among diary responses and provide unbiased significance tests (West, Ryu, Kwok, & Cham, 2011). The *a*-paths in our multilevel mediational model are described by the following set of level 1 equations:

$$(1)\ \text{upward}_{ij} = \beta_{0j} + \beta_{1j} * (\text{FBusage}_{ij}) + e^{upward}_{ij}$$

$$(2)\ \text{nondirectional}_{ij} = \beta_{2j} + \beta_{3j} * (\text{FBusage}_{ij}) + e^{nondir}_{ij}$$

$$(3)\ \text{downward}_{ij} = \beta_{4j} + \beta_{5j} * (\text{FBusage}_{ij}) + e^{downward}_{ij}$$

in which each of the social comparisons measures (i.e., upward_{ij}, $\text{nondirectional}_{ij}$, downward_{ij}) are regressed on a measure of Facebook usage (i.e., FBusage_{ij}). The presence of $_{ij}$ subscripts for the social comparisons outcomes, Facebook predictor, and residuals (i.e., e^{upward}_{ij}, e^{nondir}_{ij}, $e^{downward}_{ij}$) signals that these terms vary across both persons (j) and diary reports (i). Finally, the $\beta_{0j} - \beta_{5j}$ coefficients represent the intercepts (β_{0j}, $\beta_{2j,}$ β_{4j}) and slopes (β_{1j}, $\beta_{3j,}$ β_{5j}), which vary randomly across persons. Using the slopes-as-outcomes formulation for describing multilevel models, each of these level 1 coefficients is represented as an outcome variable in a level 2 equation. For the sake of brevity, we only include the level 2 equations for upward social comparisons.

$$(4)\ \beta_{0j} = \gamma_{00} + \gamma_{01} * (\overline{\text{FBusage}}_{.j}) + u_{0j}$$

$$(5)\ \beta_{1j} = \gamma_{10} * (\text{FBusage}_{ij}) + u_{1j} * (\text{FBusage}_{ij})$$

In equation 4, γ_{00} represents the fixed component of the intercept or the grand mean of upward_{ij} across all persons and diary responses, γ_{01} is the cross-level effect of a person's average Facebook usage ($\overline{\text{FBusage}}_{.j}$), and u_{0j} is the random component representing person-

specific deviations from this overall mean. Similarly, γ_{10} reflects the fixed or average regression coefficient for $FBusage_{ij}$ across all persons, and u_{1j} is the random (person-specific) component of this slope. The level 2 equations for $nondirectional_{ij}$ and $downward_{ij}$ have an identical structure to equations 4 and 5.

Turning to the second stage of our mediational model, the *b*- and *c′*-paths describe the regression of daily depressive symptoms ($CESD_{ij}$) on the mediators ($upward_{ij}$, $nondirectional_{ij}$, $downward_{ij}$), and the exogenous predictor ($FBusage_{ij}$), respectively.

$$(6)\ CESD_{ij} = \beta_{6j} + \beta_{7j} * (upward_{ij}) + \beta_{8j} * (nondirectional_{ij}) + \beta_{9j} * (downward_{ij}) + \beta_{10j} * (FBusage_{ij}) + e^{CESD}{}_{ij}$$

In equation 6, β_{6j} represents the random intercept for daily depressive symptoms scores, whereas β_{7j}- β_{9j} represent random slopes for the mediators (*b*-paths), and β_{10j} reflects the random slope for the exogenous predictor (*c′*-path). Finally, $e^{CESD}{}_{ij}$ carries the level 1 residual. Each of the coefficients in equation 6 can be expressed as a level 2 equation; however, to avoid presenting redundant information, only the equations for the first two coefficients are provided.

$$(7)\ \beta_{6j} = \gamma_{60} + \gamma_{61} * (\overline{upward}_{.j}) + \gamma_{62} * (Gender_{j}) + u_{6j}$$

$$(8)\ \beta_{7j} = \gamma_{70} * (upward_{ij}) + \gamma_{71} * (upward_{ij} * Gender_{j}) + u_{7j} * (upward_{ij})$$

In equation 7, γ_{60} represents the fixed component of the intercept or the grand mean of all depressive symptoms scores across all persons and diary responses. γ_{61} describes the cross-level effect of a person's average level of upward social comparisons across all diary responses ($\overline{upward}_{.j}$), γ_{62} expresses the difference in daily depressive symptoms as a function of participant gender (men = 0; women = +1), and u_{6j} represents the random, person-specific deviation of depressive symptoms from the grand mean. Turning to equation 8, γ_{70} is the fixed or average regression of $CESD_{ij}$ on $upward_{ij}$ across all persons, γ_{71} carries the cross-level interaction which describes the extent to which the average slope changes as a function of the person's gender, and u_{7j} describes the random effect for the slope. The level 2 equations for β_{8j}-β_{10j} are identical in structure to equation 8 (β_{7j}) in that they include cross-level interactions terms for $Gender_{j}$, and random effects.

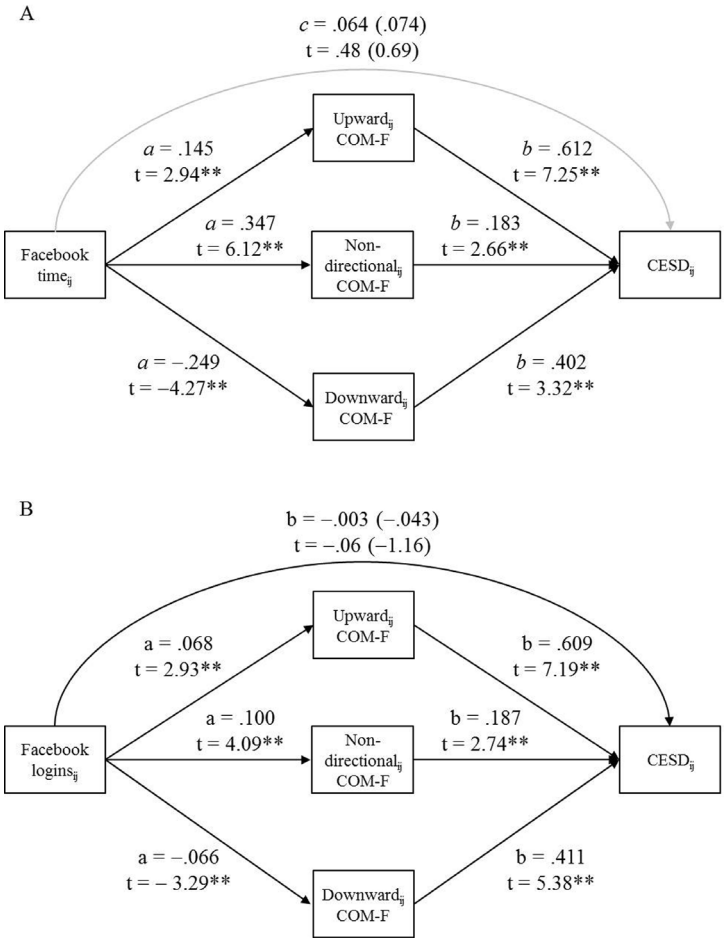

FIGURE 2. Mediational Model for Study 2 .
Note. *p < .05; **p < .01

In all models, level 1 predictor variables were centered within-persons, and the person-level aggregate predictors were grand-mean centered (West et al., 2011). This centering scheme removes all of the person-specific variability from level 1 predictors, and the level 2 aggregate re-introduces this person-specific variability as a distinct predictor. Under this centering scheme, level 1 coefficients represent the within-persons or daily effect of the predictor, and the level 2 aggregate represent between-persons or aggregate effects. Given that we were interested in the day-to-day impact of Facebook

usage, we focused on the level 1 coefficients in the present analysis. More specifically, we aimed to test a multiple-mediator version of the lower-level or 1-1-1 mediation model described by Bauer and colleagues (Bauer, Preacher, & Gil, 2006). Parameters were estimated using SAS PROC MIXED (SAS Institute, 2011) with restricted maximum likelihood estimation. In addition to the person-specific non-independence modeled by the random intercept, non-independence among temporally adjacent level 1 outcomes (Wickham & Knee, 2013) was modeled by fitting an autoregressive structure to the level 1 residual covariance matrix. The lagged and concurrent × lagged (sensitization-satiation) predictors were also examined (Wickham & Knee, 2013), but none of the effects reached significance and were dropped from the final model.

RESULTS

Participant-level variables were manually screened for irregularities and responses provided by two female participants were excluded because they reported unusually high number of logins per day (108 and 365 logins on average per day) relative to the overall mean of 6.93 logins per day (SD = 8.01). This left a total of 152 participants (93 females, 59 males).

Descriptive Statistics

A multivariate random intercept model (Mehta & Neale, 2005; Raudenbush, 1995) was examined using SAS PROC MIXED (SAS Institute, 2011) for the Facebook usage, social comparisons, and depressive symptoms measures. This approach allows for the estimation of a within-persons correlation matrix from diary data, which is presented in Table 2, along with the means and standard deviations for these variables. A series of mixed-effects models revealed no significant gender differences on any of the diary measures (all *p*s > .51).

Primary Analysis

Null Random Intercept Models. Null random intercept models were examined for the three social comparison mediators (upward, nondirectional, downward) and the outcome variable

(depressive symptoms). These unconditional models provide an initial estimate of the variability at the within- and between-persons level, that are useful for computing the proportion variance explained by predictors in the conditional models. For upward social comparisons, the level 2 variance was $\tau^2_{00} = 7.08$, the level 1 variance was $\sigma^2 = 5.70$, and the raw temporal carryover parameter was .83 ($\rho = .14$). For nondirectional social comparisons, the level 2 variance was $\tau^2_{00} = 7.24$, the level 1 variance was $\sigma^2 = 7.92$, and the raw temporal carryover parameter was 1.32 ($\rho = .17$). For downward social comparisons, the level 2 variance was $\tau^2_{00} = 9.43$, the level 1 variance was $\sigma^2 = 8.04$, and the raw temporal carryover parameter was 1.21 ($\rho = .14$). Finally, for depressive symptoms, the level 2 variance was $\tau^2_{00} = 22.30$, the level 1 variance was $\sigma^2 = 43.46$, and the raw temporal carryover parameter was 9.86 ($\rho = .23$). Intraclass correlations (ICC) ranged from .48 to .55 across the 3 mediators variables, suggesting that the total variance in social comparisons was approximately equally distributed between levels 1 (within-persons) and 2 (between-persons). In contrast, the ICC of .34 for depressive symptoms suggests that the majority of variability in depressive symptomology was within-persons.

Mediation Model for Facebook Time. H1-H4 and H5-H8 were components of the moderated mediation hypotheses and each separate hypothesis represented a mediational pathway. H1 states that the daily amount of time spent on Facebook would be positively related to depressive symptoms at the daily level (the *c* path). Facebook time was entered as a predictor of depressive symptomology (Level 1), but the level 1 coefficient failed to reach significance, $\gamma_{101} = .064$, t (151) = .48, $p = .63$. Thus, time on Facebook appeared to be unrelated to depressive symptoms. However, Kenny and colleagues (Kenny, Kashy, & Bolger, 1998) point out that a significant association between the predictor and outcome variables is not necessary to establish an indirect effect from the predictor to the outcome via mediating variables. In fact, the statistical test of this is often underpowered relative to the tests for the *a*- and *b*-paths, as well as the test of the indirect effects.

In H2, we predicted that time spent on Facebook would be related to daily Facebook social comparisons (the *a* paths). As reflected in equations 1–5, a multilevel regression model was specified in which both the Level 1 and Level 2 (aggregate) time on Facebook (FBtime) along with the gender main effect and interaction terms were en-

tered as predictors into the equations with daily Facebook social comparisons (Level 1) as the criterion variables. None of the gender main-effects or interactions reached significance, so these predictors were dropped to increase the precision of the FBtime coefficients (Snjiders & Bosker, 2012) and the models were re-estimated. Significant level 1 effects emerged across all three models, as illustrated in Figure 2A. Time spent on Facebook was positively related to both upward, $\gamma_{10} = .145$, $t(151) = 2.94$, $p < .01$, and nondirectional social comparisons, $\gamma_{30} = .347$, $t\ (151) = 6.12$, $p < .01$, suggesting that individuals experienced more frequent upward and nondirectional social comparisons on days when they spent more time of Facebook. A significant level 1 coefficient was also observed for FBtime predicting downward social comparisons, but in the opposite direction, $\gamma_{50} = -.249$, $t\ (151) = -4.27$, $p < .01$. Comparing the level 1 variance estimates from the null models to the conditional models revealed that FBtime explained some degree of variability in daily reports of upward ($\sigma^2_{cond} = 5.32$, pseudo $R^2 = .07$), nondirectional ($\sigma^2_{cond} = 7.36$, pseudo $R^2 = .07$), and downward ($\sigma^2_{cond} = 7.53$, pseudo $R^2 = .06$) social comparisons. Finally, all of the random slope variances were significant (all ps $< .01$), suggesting that the magnitude of these *a*-paths varied across participants. On the whole, these findings suggest that on days where individuals reported spending more time on Facebook, they tended to report engaging in more nondirectional and upward Facebook social comparisons and fewer downward social comparisons.

In the second half of our mediational model (*b*-paths), the relationship between upward, nondirectional, and downward social comparisons and depressive symptomology was examined while controlling for daily time spent on Facebook (i.e., equations 6–8). Analyses revealed significant positive associations between daily depressive symptoms and upward, $\gamma_{70} = .612$, $t(137) = 7.25$, $p < .01$, nondirectional, $\gamma_{80} = .183$, $t(129) = 2.66$, $p < .01$, and downward $\gamma_{90} = .402$, $t(128) = 5.15$, $p < .01$ social comparisons. In contrast to the previous model, only upward and downward social comparisons regression coefficients exhibited heterogeneity across participants, as evidenced by significant random slope variances (both ps $< .01$). Collectively, the social comparisons predictors explained a noteworthy proportion of variability in daily depressive symptoms ($\sigma^2_{cond} = 37.34$, pseudo $R^2 = .14$).

As in Study 1, the indirect effect of FBtime on depressive symptoms via social comparisons was assessed using the test of the *ab*

products. Unlike normal regression, the *ab* products in multilevel modeling are not equivalent to the *c-c′* estimates, but rather they represent an exclusive mediated effect; however, the Sobel approach for testing the significance of the *ab* products (Sobel, 1982) remains a valid approach (Krull & MacKinnon, 1999). There was a significant indirect effect from time on Facebook to depressive symptoms via upward ($Z = 2.72$, $p < .01$), nondirectional ($Z = 2.44$, $p < .01$), and downward social comparisons ($Z = 2.62$, $p < .01$).

Mediation Model for Facebook Logins. H5–H8 also predicted moderated mediation (similar to H1–H4) but with Facebook views/logins as the predictor and gender as the moderator. As previously mentioned, the only difference between the two models is that number of logins on Facebook served as the predictor variable rather than the amount of time spent on Facebook. Thus, all analyses to test the mediation model with Facebook logins as the predictor were identical to those for Hypotheses 1–4. Moreover, the pattern of results, as illustrated in Figure 2b, was identical to the previous model. Sobel tests also confirmed the presence of significant indirect effects from Facebook login frequency to daily depressive symptoms, via upward ($Z = 2.71$, $p < .01$), nondirectional ($Z = 2.28$, $p < .05$), and downward ($Z = 2.81$, $p < .01$) social comparisons.

Alternative Models. As with study 1, alternative (reverse causation) models were examined to evaluate the possibility that people with depressive symptoms were more likely to spend more time on Facebook making social comparisons. The *a*-paths leading from depressive symptoms to all social comparison measures were significant or marginal (all *p*s < .07). However, only two of the possible six *b*-paths leading from social comparisons to Facebook usage were significant or marginally so. These two paths included nondirectional social comparisons to time spent on Facebook, $\gamma = .078$, $t(137) = 5.27$, $p < .01$, and to Facebook logins, $\gamma = .074$, $t(137) = 1.86$, $p < .07$. The remaining four *b*-paths from upward and downward social comparisons to Facebook time and logins were all nonsignificant (all *p*s > .12). These alternative models also suggest that of the six reversed indirect effects, only one was marginally significant (nondirectional social comparisons, $Z = 1.89$, $p < .06$, to Facebook time). All five of the remaining indirect effects failed to reach significance. These findings provide additional evidence for our hypothesized process model.

DISCUSSION

In sum, most of the hypotheses for Study 2 were supported, with the exception of the gender hypothesis. After controlling for the different types of social comparisons across all participants, all three types of social comparisons (upward, downward, and nondirectional) were uniquely found to be significant mediators of the relationship between time on Facebook and depressive symptoms. These results were consistent with the findings from Study 1 which utilized a nondirectional social comparison measure. Thus, overall results revealed that spending a great deal of time on Facebook (or viewing Facebook more frequently) is positively related to comparing one's self to others, which in turn is associated with increased depressive symptoms."

Moreover, in Study 2, we found an identical pattern of all three types of Facebook social comparisons uniquely serving as significant mediators between frequency of viewing Facebook and depressive symptoms. These results provide further evidence for our original hypotheses. That is, frequently viewing Facebook appears to be functionally equivalent to spending greater amounts of time on Facebook. Perhaps, more Facebook views and/or spending a greater amount of time on Facebook on a daily basis both allow participants greater opportunity to spontaneously socially compare themselves to their peers, which in turn is associated with an increase in daily depressive symptoms.

There are several factors that may be contributing to this consistent mediated effect across the two studies. Previous research has found that people often display their idealized or hoped-for possible selves on Facebook, through various modes of identity construction (e.g., posts, pictures, status updates; Zhao, Grasmuck, & Martin, 2008). That is, many individuals on Facebook may be sharing only positive and/or self-enhancing news but not fully disclosing their daily struggles in order to appear more socially desirable. Although these Facebook self-presentations appear to have a positive effect on the subjective well-being of those constructing their online identities (Kim & Lee, 2011), frequently viewing these portrayals may intensify other people's negative cognitions behind the scenes. This may be due to the fact that people often think they are alone in feeling negative emotions (Jordan et al., 2011). This emotional pluralistic ignorance combined with Facebook social comparisons

based upon their friend's highlight reels, could potentially provoke or exacerbate negative emotions and cognitions, and thus, contribute to greater depressive symptoms. Moreover, this positive association between Facebook social comparison and depressive symptoms was consistent for all three types of social comparison (b path).

The only major difference between how the different types of social comparison function was that the relationship between time on Facebook and Facebook logins were both significantly and negatively associated with making downward social comparisons (a path). That is, on days that individuals spent more time on Facebook (or frequently viewed Facebook), they tended to make fewer downward social comparisons (e.g., feel they are more accomplished than their Facebook peers). By contrast, the relationship between time on Facebook (and Facebook logins) was significantly and positively associated with upward and nondirectional social comparisons (a path). Due to the fact that we controlled for the other types of social comparison, results revealed that participants may have been comparing themselves to others (nondirectional social comparisons) and/or perhaps feeling inferior to their peers (upward social comparisons) instead.

Nevertheless, as expected, daily downward social comparisons were still positively associated with daily depressive symptoms (b path). This result might be surprising given the literature suggesting that downward social comparisons are often linked to positive effects (e.g., Allan & Gilbert, 1995; Amoroso & Walters, 1969; Wills, 1981). However, our findings are consistent with other literature suggesting that engaging in frequent social comparisons of any kind may be deleterious to one's mental well-being (White et al., 2006). Furthermore, our results may differ from previous studies in that we controlled for the other two types of social comparisons in our analyses.

Our study also provides evidence that engaging in downward social comparisons may be indicative of defensiveness. Consistent with previous research, individual differences, such as low self-esteem, may be moderating whether downward social comparisons elicit negative affect (Buunk et al., 1990). That is, perhaps individuals with low self-esteem might be engaging in downward social comparisons on Facebook in order to improve or bolster their self-worth (a defensive mechanism); however, after doing so, they actually feel worse. Thus, participants who make any type of so-

cial comparisons on Facebook on a given day appeared more depressed. This is supported by the result that nondirectional social comparisons predicted depressive symptoms in both studies with two different samples. Future research should explore additional moderators of this relationship.

Although it did not affect the results of the mediational analysis, a notable difference between the two studies was that the relationship between time on Facebook and depressive symptoms was not significant in Study 2. In fact, depressive symptoms were uncorrelated with time on Facebook at the daily diary level (see Table 2) whereas these two variables were significantly correlated ($r = .32$ $p < .01$ for females; $r = .57$ $p < .01$ for males) in Study 1 (see Table 1). Given the fact that two of the mediators have positive effects (upward and nondirectional social comparisons) and that the other mediator has a negative effect on the a path (downward social comparison), this may account for why the total effect for the relationship between time on Facebook and depressive symptoms was nonsignificant.

The second major distinction between the two studies was that gender was not found to be a moderator at the within-persons level for Study 2. In Study 1, results demonstrated that making nondirectional social comparisons on Facebook mediated the association between time spent on Facebook and depressive symptoms for men only. However, because there were fewer men than women who participated, and the ones who did reported on average a mild level of depressive symptoms, the gender differences for Study 1 may not be generalizable. Diary methodology is generally considered to be a more precise representation of everyday behavior than cross-sectional studies due to a decrease in retrospective bias.

Finally, in both studies, we tested the possibility that the predictor (time on Facebook) and the outcome (depressive symptoms) might be reversed. That is, highly depressed people might spend more time on Facebook, perhaps in an effort to bond with others, and therefore, might be more prone to making social comparisons. However, after testing this alternative model in Study 1, we found that the mediated effect of nondirectional social comparison was nonsignificant. Likewise, in Study 2, the reversed indirect effect was marginally significant for nondirectional social comparisons with Facebook time as the outcome variable only (but not for Facebook logins as the outcome). Moreover, upward and downward social comparison indirect effects failed to reach significance. These results render additional support for our hypothesized process model that

people who spend more time on Facebook on a daily basis people are more likely to compare themselves to others and in turn report greater daily depressive symptoms (regardless of gender).

Limitations and Future Directions

In light of the current studies' strengths, there are several limitations which need to be examined. One major limitation of both studies was that they were correlational. Therefore, causality cannot be inferred with as much confidence as experiments. Additionally, extraneous influences on participants could not be controlled because participants were filling out reports online at their leisure rather than in the laboratory. Thus, potential third-variable confounds may be evident. For instance, other daily events may have impacted participants' Facebook usage and/or their reports of depressive symptoms on a given day. Future research should incorporate open-ended questions in order to control for these possible factors.

Another potential limitation is that the consequences of social comparison were included in the items measuring downward and upward social comparison items (i.e., Today, when I was on Facebook, I believed that I had accomplished more than other people had.) in Study 2. Upward and downward social comparisons are, by definition, feeling better than or worse than others with whom one compares one's self to, and thus there could be some affective component embedded in the directional items that overlaps with depressive symptoms. However, if the affective component of the directional items were driving our results, we would expect that upward social comparison would be positively related to depressive symptoms, downward social comparison would be negatively related to depressive symptoms, and nondirectional social comparison would be unrelated to depressive symptoms. On the contrary, our results indicate that any kind of social comparison (upward, downward, and nondirectional) was related to depressive symptoms regardless of the direction.

As previously mentioned, other studies have found that excessive internet use is associated with depressive symptoms (e.g., Morrison & Gore, 2010). Although the design of the present study did not examine general internet use, it is possible that the findings may be

attributable to excessive internet usage (e.g., turning to the internet to alleviate loneliness). Follow-up studies could easily address this inferential limitation by obtaining an independent measure of overall internet usage.

Along these lines, another major limitation of both studies was that we did not gain access to participants' Facebook accounts but rather both studies solely relied on self-reports. Accessing participants' Facebook accounts might provide greater specificity as to what types of Facebook postings (pictures, status updates, etc.) provoke Facebook social comparisons and offer an explanation as to why such activities elicit comparisons. Furthermore, self-reports might be subject to biases, possibly by participants' level of depressive symptoms. Future studies might consider requesting that participants use PDAs to access Facebook in order to gain a more objective measure of time spent on Facebook, frequency of Facebook logins, and to more accurately monitor participants' daily Facebook activities.

Despite the aforementioned limitations, the diary design is still considered to be more discriminating (and accurate) than a one-time report on general frequencies of Facebook use and general feelings about Facebook experiences. Furthermore, a major strength of the diary design is that it allows for inclusion of Level 2 aggregates (the between-persons effects) to parse out within- and between-effects. Thus, it was possible to examine the pure within-persons effect to see how engaging in daily social comparisons may be influencing depressive symptoms over time. Moreover, because social comparisons cannot be assessed by merely examining a participant's Facebook page, diary methodology provides the most practical way to measure participants' Facebook social comparisons.

Finally, another possible limitation is that participants were pooled from a college population. Because college students are transitioning from living under the rules and guidance of their parents to becoming more influenced by peers, they may be more susceptible to Facebook social comparison. Thus, the results of this study may not be generalizable to older or younger Facebook users. Future research should explore these populations of Facebook users to see if Facebook social comparison influences differing age groups in the same manner. Moreover, although Study 2 utilized a diary design, we only assessed participants' responses over a two-week

period. Future longitudinal studies could investigate whether the relationships between Facebook usage, Facebook social comparison, and well-being remain relatively stable or change significantly over time.

Conclusion

McLuhan (1964) may be correct in his assertion that the medium is the message. That is, new media come with central, obvious messages but also often hold unforeseen, deleterious consequences. Facebook's message is clear—it is a medium designed to connect people to one another. However, the negative health outcomes associated with Facebook use may not be inherent to the platform, but rather are unintended consequences related to how people choose to use this medium. Specifically, certain individuals may be more susceptible to comparing themselves to others' Facebook highlight reels on dimensions they feel are personally relevant, whereas other people viewing the same information may not respond in the same way.

A major contribution of the present research is that it provides evidence that computer-mediated interactions on Facebook may indeed negatively impact users' psychological health. Moreover, these studies found that spending more time on Facebook and/or viewing Facebook more frequently, provides people with the opportunity to spontaneously engage in Facebook social comparisons (of any kind), which in turn, is associated with greater depressive symptoms. This pattern of higher depressive symptoms after engaging in Facebook social comparisons may be especially true for college students since they may still be struggling to establish their identities apart from their families, and, consequently, may be more susceptible to peer influences. Thus, the current research holds important implications for general populations and, in particular, college students who are depressed and might also be addicted to Facebook. Future interventions might target the reduction of Facebook use among those at risk for depression.

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