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The Role of Social Media Use on Mental Health Outcomes

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The Role of Social Media Use in Mental Health Outcomes

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Abstract

The current study examined how social media behaviors influence the development of negative mental health outcomes. Participants completed a survey at two time points examining the role of self-esteem in mental health (anxiety, depression) related to social media variables (online social comparison, fear of missing out [FoMO], and social media use frequency and intensity). Results showed no association between social media use and mental health outcomes. Effects of upward social comparison and FoMO on depression and anxiety respectively were minimal. Instead, self-esteem had a strong underlying influence on what appear to be harmful effects of social media. In regards to longitudinal effects, upward social comparison at time 1 predicted self-esteem at time 2. Social media intensity at time 1 had a marginally significant relationship with depression at time 2. Anxiety at time 2 was only associated with general offline social comparison. Implications for future studies are discussed.

The Role of Social Media Use in Mental Outcomes

Over the past decade, social media sites, such as Facebook, Twitter, and Instagram have become central to many college students' daily lives. As of 2014, approximately 89% of people between the ages of 18-29 engaged in social media, including 78% of people with "some college" experience, and 73% of people who have obtained a college degree (Pew Research Center, 2014). Given how much energy and time students expend in an effort to remain informed about the lives of others through social media, there is a growing concern about whether or not social media produces psychologically harmful effects for many of its users. There are various aspects of social networking that have been associated with negative psychological effects, including frequent and intense social media use (Bevan, Gomez, & Sparks, 2014; Kross et al., 2013; Lee-Won, Herzog, & Park, 2015), online social comparison (Chou & Edge, 2012; Feinstein et al., 2013; Steers, Wickham, & Acitelli, 2014; Vogel et al., 2014), and the Fear of Missing Out (FoMO) (Fox & Moreland, 2015; Przybylski, Murayama, DeHaan, & Gladwell, 2013). Low self-esteem, which is related to negative psychological well-being (Zeigler-Hill, 2011), is also linked with social media use, yet the relationship has not been clearly defined. The present study examines how these factors relate to mental health outcomes.

Frequent and intense social media use

The frequent use of social media with great investment and attachment has been associated with negative psychological outcomes for many individuals. In fact, by using longitudinal experience-sampling, Kross et al. (2013) found that the more people used Facebook at one time point, the worse they felt at the moment. Furthermore, individuals who reported greater Facebook use over a two-week span showed a decrease in overall life satisfaction. Another study showed that individuals who spent more time per day on social media (other than

Facebook) and belonged to more social networks reported higher stress levels and lower quality of life (Bevan, Gomez, & Sparks, 2014). With studies supporting a decrease in life satisfaction and higher stress levels, it is evident that frequent and intense use of social media contributes to poor psychological outcomes. Therefore, I hypothesized that social media use and intensity would be positively associated with anxiety and depre5ssion. However, social media use may not directly cause these negative outcomes. Rather, it may encourage certain types of cognitive or emotional processes that in turn lead to poor psychological outcomes. Two possible processes have been investigated: online social comparison and the fear of missing out. The current study predicts that the effect of social media use on depression will be mediated by upward social comparison, and the effect of social media use on anxiety will be mediated by the fear of missing out.

Social Comparison

Individuals have an innate desire to compare themselves socially to others as a way of evaluating their own abilities and behaviors (Festinger, 1954). There are three different types of social comparison, including non-directional (comparing oneself to similar others), downward social comparison (seeing oneself as superior to others), and upward social comparison (seeing oneself as inferior to others) (Wood, 1989). Regardless of the direction of comparison (downward, upward, or non-directional), frequently comparing oneself to others on social media can be harmful to one's mental health, especially in developing depression and low self-esteem (Steers, Wickham, & Acitelli, 2014; Vogel et al., 2014). Through a cross-sectional survey study, Steers et al. (2014) found that all three types of social comparison partially mediated the relationship between Facebook use and depressive symptoms in men, but not women, suggesting that spending a great deal of time on Facebook is positively related to comparing one's self to

others, consequently increasing one's depressive symptoms. By using a 14-day diary design, Steers et al. (2014) also found that social comparison fully mediated the relationship between Facebook logins and depressive symptoms for both genders, further extending the evidence of the relationship between online social comparison and depression. The more the participants used Facebook on a given day, the more depressed they reported feeling that day because they spent more time comparing themselves to others.

Online downward comparison has been positively associated with depressive symptoms as well, which indicates that such comparison may be indicative of defensiveness. Even in the event that downward social comparison is not used as a faulty defense mechanism, people tend to engage in less downward comparisons on days they spend more time on social media (Steers et al., 2014). Upward comparisons, on the other hand, are especially likely to occur on social media because many friends post their "highlight reels," focusing their posts on positive, happy events. Users are more likely to disclose positive emotional experiences and lead viewers to believe that their emotional well-being is better than it actually is (Qiu, Lin Leung, & Tov, 2012). Chou and Edge (2012) found that individuals who frequently use Facebook and have a lot of friends they do not know personally tend to believe that others have much better lives than them and that life is not fair, an indication of depressive symptoms. Such thoughts can lead individuals to constantly think lowly about themselves and ruminate. In fact, another study showed that social media use was positively associated with rumination, which in turn can develop into depressive symptoms (Feinstein et al., 2013). Because people tend to post self-enhancing information on their profile page, social media provides ample opportunities for people to engage in and suffer from upward social comparison. Upward social comparison can

potentially provoke or exacerbate negative emotions and cognitions, and thus contribute to depressive symptoms (Steers et al., 2014).

Social comparison has been linked to self-esteem as well. In an experimental study designed to determine if there is a causal link between self-esteem and social comparison on social media, Vogel et al. (2014) exposed participants to a fictitious social media profile prompting either downward comparison (low social network activity, unhealthy habits) or upward social comparison (high social network activity, healthy habits). The results of the study showed that upward social comparison significantly predicted trait self-esteem and partially mediated the relationship between frequency of Facebook use and self-esteem while downward social comparison showed no relation with self-esteem. The current study predicted that not only will upward social comparison be associated with depression, but upward social comparison will also mediate the relationship between social media use and depression.

Fear of Missing Out

Despite the negative feelings about one's life and performance influenced by social comparison, many users continue their use because they feel pressured to access social media frequently so they can keep up with their friends and relieve their Fear of Missing Out (FoMO) (Fox & Moreland, 2015). Characterized by the desire to be continuously connected with what one's peers are doing, FoMO is defined as "a pervasive apprehension that others might be having rewarding experiences from which one is absent" (Przybylski et al., 2013). According to Przybylski et al. (2013), FoMO causes a general feeling of unhappiness and is negatively associated with overall life satisfaction and mood. Regardless of the poor mental outcome FoMO produces, such fear influences people to use social media more often in order to keep up with the lives of others and keep their own relationships intact. FoMO is so influential, that Przybylski et

al. (2013) found that people high in FoMO tended to use Facebook more often immediately after waking and before going to sleep, were more likely to use Facebook during class lectures, and compose and check text messages and emails while operating motor vehicles. Because people who have a fear of missing out tend to use Facebook and other social media outlets more than people who do not have such fear, they are exposed to more opportunities to engage in behaviors like upward social comparison and, as a result, experience even more ongoing negative feelings (Lee, 2014). Therefore, social media not only influences people to develop poor beliefs about themselves, but it also influences people to fold under the pressure to continuously check to see if their friends are enjoying life without them. Based on these findings, the current study proposed that FoMO will be associated with anxiety and will mediate the relationship between social media use and anxiety.

Self-Esteem

Finally, studies have shown that self-esteem is a major factor in the development of poor psychological outcomes such as depression and anxiety. For instance, one study that used two longitudinal data sets to examine the reciprocal effects between self-esteem and depression found that low self-esteem can predict depressive reactions to stressful events and stress scores even years later, providing strong evidence that low self-esteem contributes to depression (Orth, Robins, & Roberts, 2008). In regards to anxiety, a longitudinal study found that low explicit self-esteem was predictive of Social Anxiety Disorder symptomatology two years later (van Tuijl, de Jong, Sportel, de Hullu, & Nauta, 2014).

Not only does self-esteem have an effect on psychological outcomes, it also impacts how individuals use social media. Forest and Wood (2012) found that people with low self-esteem fail to reap benefits from Facebook because they tend to make more negative posts and updates,

consequently making them less liked and perpetuating their low self-esteem. When examining college life, Kalpidou, Costin, and Morris (2011) found that college students, especially upper-classmen, who spent a lot of time on and had an emotional attachment to Facebook reported low self-esteem, suggesting that low self-esteem is costly in regards to both psychological outcomes and social media use. In the current study, the role of self-esteem in the relationship between social media and psychological outcomes was examined on an exploratory basis.

As research has shown, social media use is associated with various negative mental health outcomes. Whether a direct or mediational association, social media has been shown to contribute to individuals' poor mental health. The current study sought to investigate the relationship between social media factors, including social comparison, FoMO, and frequent and intense social media use, and negative psychological outcomes, including depression and anxiety, in a single, comprehensive study, assessing psychological outcomes at two time points. The study also examined the role of self-esteem as a mediator between the social media factors and the negative mental health outcomes. There were five hypotheses that were tested.

H1: Social media use and intensity will be positively associated with anxiety and depression.

H2: Individuals who engage more frequently in upward social comparison on social media will show greater levels of depression.

H3: Individuals who experience more FoMO will show greater levels of anxiety.

H4: The effect of social media use on depression will be mediated by upward social comparison, and the effect of social media use on anxiety will be mediated by FoMO.

H5: Social comparison online and FoMO will be associated with increases in depression and anxiety respectively over time.

Method

The current study consisted of participants completing questionnaires at two time points, assessing their social media use and behaviors and their psychological health. The two surveys were completed between 8 and14 weeks apart in order to identify whether behavior on social media impacts individuals' mental health over time.

Participants

The participants in this study were recruited from undergraduate Albright College students who were enrolled in psychology courses. The participants were contacted through email and offered extra credit in one of their psychology courses for their voluntary participation in the study. There were a total of 154 participants who completed the online survey. After eliminating those participants who did not correctly answer at least one of the attention check items (*N*=21) or failed to complete the survey in its entirety (*N*=13), there were a total of 120 participants used in the data analysis. The average age of participants was 19.2 (*SD*= 1.3). The racial makeup of the participants was 64.2% white, 15.8% black, 9.2% Asian and Hispanic, and 1.6% other. Approximately 90.1% of the participants were female.

For the Time 2 follow-up, participants were contacted via the email addresses that they provided in the first survey and were again offered extra credit in one of their psychology courses for their voluntary participation in the study. Fifty participants completed the follow-up survey. After eliminating those participants whose codes did not match with one of the codes provided in the first survey (*N*=2), there were a total of 48 participants used in the data analysis. The average age of participants completing the Time 2 survey was 19.5 (*SD*= 1.3). The racial makeup of the participants was 72.9% white, 12.5% black, 10.4 Hispanic, and 4.2% Asian. Approximately 91.7% of the participants were female.

Materials

Anxiety. In order to assess participants' anxiety levels, the Generalized Anxiety Disorder scale (GAD) (Spitzer et al., 2006) was used. Participants indicated how often they felt anxious during the past week with 7 statements on a 4-point Likert style scale (1=not at all; 4= nearly every day). Sample items include "feeling nervous, anxious, or on edge," and "not being able to stop or control worrying."

Depression. In order to assess participants' depression levels, the Center for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977) was used. For this inventory, participants indicated their agreement with 10 statements on a 4-point Likert type scale (1=rarely or none of the time; 4= all of the time). Sample items include "I was bothered by things that usually don't bother me," and "I felt that everything I did was an effort."

Fear of Missing Out. In order to assess the participants' fear of missing out on their friends' lives on social media, the Fear of Missing Out scale (FoMO; Przybylski, Murayama, DeHaan, & Gladwell, 2013) was used. Participants indicated their agreement with 10 statements on a 5-point Likert scale (1= not at all true; 5= extremely true of me). Sample items include "I fear others have more rewarding experiences than me," and "I get anxious when I don't know what my friends are up to."

Non-Directional Social Comparison. In order to assess general non-directional social comparison, the Iowa-Netherlands Comparison Orientation Scale (INCOM) was used (Gibbons & Buunk, 1999). For this inventory, participants indicated their agreement with 11 statements on a 5-point Likert type scale (1= Disagree Strongly; 5= Agree Strongly). Sample items include "I always pay a lot of attention to how I do things compared with how others do things," and "I am not the type of person who compares often with others."

Online Social Comparison. In order to measure non-directional, upward, and downward social comparisons made via social media, a modified version of the INCOM was created (modeled on Steers, Wickham, and Acitelli's (2014) adaptation of the INCOM for Facebook comparisons). For this inventory, participants indicated their agreement with 14 statements on a 5-point Likert type scale (1= Disagree Strongly; 5= Agree Strongly). This measure consisted of three different scales. While eight statements were presented to depict non-directional comparison, three statements were phrased to depict upward comparison and downward comparison. Sample items include "I pay a lot of attention to how I do things on social media compared with how others do things on social media" (general comparison), "When I'm on social media sites, I feel less confident about what I have achieved compared to other people" (upward comparison), and "when I'm on social media sites, I often pay attention to how other people do things, and feel that the way I do things is better" (downward comparison).

Self-Esteem. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) was used to assess self-esteem. For this inventory, participants indicated their agreement with 10 statements on a 4-point Likert type scale (1= strongly disagree, 4= strongly agree). Sample items include "on the whole, I am satisfied with myself" and "I am able to do things as well as most other people."

Social Media Use Frequency/Intensity. In order to assess the participants' frequency of social media use, the participants indicated how many hours per week they spent using social media. In order to assess the participants' intensity of social media use, the Facebook Intensity scale (revised to refer to social media, modeling on Ellison, Steinfield, & Lampe, 2007) was used. For this inventory, participants indicated their daily interaction on social media with 5 statements on a 7-point Likert style scale (1= never; 7= all the time). Sample items include "how often do you use social media sites?" and "how often do you update you status on social media?"

Procedure

The participants were emailed and agreed to participate by clicking on a link that led them to the online data collector, Survey Monkey. The first page of the online data collector briefed the participants on the topic of the study and required their informed consent to continue. After reading the requirements and agreeing to the informed consent of the study, the participants then proceeded to the experimental portion of the study.

Every participant was exposed to the same questions in the same order. Throughout the survey, there were several attention check questions that required the participants to provide certain answers. For example, an item would tell participants to choose “strongly agree” for quality control purposes. These questions were used as a way to buffer out any invalid responses.

To begin, the participants were asked to complete the questionnaires that regarded the feelings they had about themselves. First, participants completed the CES-D, then the GAD, then the Rosenberg Self-Esteem Scale, and then the measure of FoMO. The next part of the study asked participants to complete the questionnaires regarding their beliefs about themselves and others. Participants were given the INCOM scale and then the modified version of the INCOM scale to reflect directional comparison on social media. Participants were then asked to select what social media sites they maintain a profile on and what they consider to be their primary social media profile. After that, they were then asked to provide information regarding their social media use and were given a measure of the revised Facebook Intensity Scale. Following the aforementioned questions, they provided their demographic information and entered information that allowed them to create an anonymous four digit code used to match their data with their follow-up survey.

Participants who provided their email address and agreed to participate in the follow up study were emailed again eight weeks later upon the closing of the first survey. Due to the duration that both surveys remained open, the participants had the opportunity to complete the two surveys 8 to 14 weeks apart. The measures used in the follow up study included the CES-D, GAD, Rosenberg Self-Esteem Inventory, and social media intensity scales. Upon completing the scales, the participants entered information to create the same code they did for the first survey in order for their data to match.

Results

The relation between social media behaviors (social media use and intensity, online social comparison, FoMO) on mental health (anxiety and depression) was tested cross-sectionally, and then longitudinally. In addition, on an exploratory basis, the role of self-esteem in social media use and mental health outcomes was examined. Descriptive statistics for all variables used in the data analyses are in Table 1.

Depression

To test the relationship between social media behaviors and depression, multiple regression analyses were conducted with CESD as the criterion variable. In the regression model, control variables were entered in Step 1 (age, gender, social media intensity, hours per week on social media), variables encompassing possible consequences of social media use (FoMO, Online Social Comparison non-directional/upward/downward) and general social comparison were entered in Step 2, and self-esteem was entered in Step 3. The second, third, and fourth column of Table 2 show the regression coefficients and standard errors for CESD for Step 1, Step 2, and Step 3 models respectively. The last row indicates the change in R^2, which represents

the additional variability explained by adding the social media predictors in Step 2 and self-esteem in Step 3. Correlations between predictor variables are presented in Table 3.

Hypothesis 1 proposed that social media use and intensity would be positively associated with depression. Regression analysis revealed no significant relation between depression and social media intensity or time spent on social media. Hypothesis 2 proposed that those who engage more frequently in upward social comparison on social media would show greater levels of depression. The Step 2 column in Table 2 shows that depression indeed had a positive association with upward social comparison online, as well as with gender, FoMO, and non-directional social comparison. However, those associations did not hold when self-esteem was taken into account, which can be seen in Step 3. In fact, depression was predicted by self-esteem, causing upward online social comparison to become marginally significant and the other associations to become non-significant, which suggests that the association between depression and the social media behaviors is primarily driven by self-esteem. Hypothesis 4 was that the effect of social media use on depression will be mediated by upward social comparison. Because no effect on depression of social media intensity or time spent on social media was present, there was no effect to be mediated, so this hypothesis could not be tested.

Anxiety

To test the relationship between social media behaviors and anxiety, multiple regression analyses were conducted with GAD as the criterion variable. For this model, the same predictor variables were entered in the same order as for the model predicting CESD. Table 4 shows the regression results, with the same organization as Table 2 except that GAD is the criterion variable.

Hypothesis 1 proposed that social media use and intensity would be positively associated with anxiety. Regression analysis revealed no significant relation between anxiety and social media intensity or time spent on social media. Hypothesis 3 proposed that individuals who experience more FoMO will show greater levels of anxiety. The Step 2 column in Table 4 shows that anxiety had a positive association with FoMO, as well as non-directional and upward social comparison. However, those associations did not hold when self-esteem was taken into account, which can be seen in Step 3. Similar to the scenario examined in the relationship between depression and upward social comparison, anxiety was predicted by self-esteem, causing the association with FoMO to become marginally significant and the other associations to become non-significant. This suggests that the association between anxiety and the social media behaviors is also driven by self-esteem. Hypothesis 4 was that the effect of social media use on anxiety will be mediated by FoMO. Because no effect of social media intensity or time spent on social media was present, there was no effect to be mediated.

Self-Esteem

The main analyses of the current study showed that self-esteem was associated with CESD, GAD, FoMO, and upward social comparison (refer to Table 3 for correlation coefficients). The main analyses also showed that self-esteem was the primary underlying factor in the regression models for depression and anxiety (refer to Table 2 and Table 4). Because of self-esteem's predominant role in the primary analyses, a multiple regression analysis was conducted to determine if self-esteem interacted with social media intensity to predict FoMO as an exploratory measure. In the regression model, control variables were entered in Step 1 (age, gender, social media use) and social media intensity and self-esteem were entered in Step 2, along with a social media intensity X self-esteem interaction term. The second and third column

of Table 5 shows the regression coefficients and standard errors for FoMO for Step 1 and Step 2 models respectively. Step 2 in Table 5 shows that there was a significant main effect of social media intensity, with greater social media intensity associated with higher levels of FoMO, as well as a significant interaction between self-esteem and social media intensity. As Figure 1 shows, the effect of social media intensity on FoMO was only present for those with low self-esteem. That is, people with low self-esteem who reported high social media intensity showed higher levels of FoMO than people with low self-esteem who reported low social media intensity, yet people with high self-esteem were not impacted by social media intensity.

A multiple regression analysis was also conducted to determine if self-esteem interacted with social media intensity to predict upward social comparison. In this model, the same predictor variables were entered in the same order as for the model predicting FoMO. The rows and columns in Table 6 represent those as in Table 5, but only for upward social comparison as the criterion variable. Step 2 in Table 6 shows that there was a significant main effect of self-esteem on upward social comparison, yet no significant interaction was present. That is, the effect of social media intensity on upward social comparison was similar between those with high self-esteem and those with low self-esteem. In essence, people with low self-esteem tended to experience more upward social comparison regardless of social media intensity.

Longitudinal Analyses

The relation between social media use and long term psychological effects was also examined by testing the association between Time 1 variables and CESD and GAD at Time 2.

Depression. Hypothesis 5 proposed that social media behaviors would influence the development of depression and anxiety over time. To test whether behavior on social media will influence the development of depression over time, multiple regression analyses were conducted

with CESD at time 2 as the criterion variable. In the regression model, control variables were entered in Step 1 (age, gender, social media intensity, hours per week on social media, CESD at time 1) and variables encompassing possible consequences of social media use (FoMO, online social comparison non-directional/upward/downward), general social comparison, and self-esteem were entered in Step 2. In order to assess change in depression over time and examine if CESD at time 2 was predicted by the social media variables at time 1, CESD at time 1 was held constant in Step 1, consistent with a regressed change data analysis approach (Collins & Horn, 1991). The second and third column of Table 7 shows the regression coefficients and standard errors for CESD at time 2 for Step 1 and Step 2 models respectively. The last row indicates the change in R^2, which represents the additional variability explained by adding the social media predictors in Step 2.

As Step 1 shows, CESD at time 2 was positively associated with social media intensity and CESD at time 1. Once accounting for all of the predictor social media variables at time 1 in Step 2, the association between CESD at time 2 and CESD at time 1 remained significant, yet the association between CESD at time 2 and social media intensity was weakened to marginal significance. No other social media variables at time 1 predicted CESD at time 2. These results suggest that social media behavior does not impact the development of depression over time.

Anxiety. To test whether behavior on social media would influence the development of anxiety over time, multiple regression analyses were conducted with GAD at time 2 as the criterion variable. For this model, the same predictor variables were entered in the same order as for the model predicting CESD at time 2, but with GAD at time 1 replacing CESD at time 1. The rows and columns in Table 8 represent those as in Table 7, but only for GAD at time 2 as the criterion variable.

It was expected that social media behaviors at time 1 would influence the development of anxiety over time. As Step 1 shows, GAD at time 2 was predicted by social media intensity and GAD at time 1. Once accounting for all of the predictor social media variables at time 1 in Step 2, the association between GAD at time 2 and GAD at time 1 remained significant, yet the association between GAD at time 2 and social media intensity became non-significant. Interestingly, general social comparison was the only predictor variable significantly related to GAD at time 2. This suggests that the frequency of engaging in general social comparison may be related to one's anxiety levels over time regardless of social media behavior.

Self-esteem. Because self-esteem had such a great influence on the relationships between predictor variables and mental health in the time 1 analysis, on an exploratory basis, I chose to examine whether behavior on social media would influence the development of self-esteem over time. To test whether self-esteem would be predicted by any social media variables, a multiple regression analysis was conducted with self-esteem at time 2 as the criterion variable. For this model, the same predictor variables were entered in the same order as for the model predicting CESD at time 2, but with self-esteem at time 1 replacing CESD at time 1. The rows and columns in Table 9 represent those as in Table 7, but only for self-esteem at time 2 as the criterion variable.

As Step 1 shows, self-esteem at time 2 was associated with self-esteem at time 1 and was marginally associated with participants' age. These associations held in Step 2. Self-esteem at time 2 was negatively associated with upward social comparison at time 1. These results suggest that engaging in upward social comparison is associated, not only with the presence of lower self-esteem, but also with a decrease in self-esteem overtime.

Discussion

The current study examined the association between social media use and psychological well-being. The findings in the current study provide no support for the existence of a relationship between social media use and mental health, and only minimal support for the existence of a relationship between social media-related psychological variables and mental health. Rather, it appears that self-esteem may be the driving force in the relationship between social media variables and mental health.

Social media use frequency and intensity were found not to be related to depression or anxiety. These findings are inconsistent with my first hypothesis and with Steers' et al. (2014), Feinstein's et al. (2013), Kross' et al. (2013) and Bevan's et al. (2014) suggestion that there is an association between social media use frequency and intensity and mental health. This association may be the direct result of participants' inaccurate estimates of their own social media use, or the more immediate rather than cumulative effects of social media. Another reason why the current results differed from previous studies may be because the current study examined the frequency and intensity of social media use broadly while previous studies focused primarily on Facebook use.

The second hypothesis examined the relationship between upward online social comparison and depression. Even though there was an initial relationship established between upward social comparison and depression, the association was weakened once self-esteem was taken into account. Based on the definition Przybylski et al. (2013) provided for FoMO, the third hypothesis proposed that FoMO would be associated with anxiety. An association between FoMO and anxiety was established, yet that association was weakened once self-esteem was taken into account. These results suggest that self-esteem plays a mediating role in the relationship between upward social comparison and depression and between FoMO and anxiety.

That is, self-esteem is the underlying factor that drives the relationship between social media behaviors and depressive and anxiety symptoms. These results imply that people who have low self-esteem are more likely to engage in upward social comparison and FoMO and, in turn, experience depression and anxiety symptoms respectively.

The current study also examined whether upward social comparison and FoMO would mediate the relationship between social media use and depression and anxiety respectively. Because there was no effect of social media use or intensity on mental health, it was concluded that upward social comparison and FoMO did not mediate the relationship between social media use and depressive and anxiety symptoms, as there was no effect to be mediated. These findings are inconsistent with Steers et al., (2014) who found that upward social comparison mediated the relationship between social media use and depression. Our findings may differ from Steers et al. (2014) because they focused on participants' time spent on Facebook daily, while the current study examined how many hours participants spent on social media per week as well as how people used social media.

Because self-esteem played such a large role in the primary analyses, I further examined its role with several exploratory analyses. These analyses revealed that social media intensity was a predictor of greater FoMO, but only for individuals with low self-esteem. This outcome suggests that some negative effects of social media use may be confined to certain, at-risk individuals. Such results add to the literature regarding FoMO because self-esteem was not included in previous studies. Self-esteem also was significantly negatively associated with making upward social comparisons online, and this was regardless of social media intensity. Because people constantly post their "highlight reels" on social media, making upward social comparisons is virtually inevitable for social media users with low self-esteem, not just those

who engage in greater social media intensity. These findings provide further evidence of the underlying influence of self-esteem.

In regards to the long term effects of social media on mental health, the current study predicted that social media behaviors would be associated with changes in depression or anxiety over a 2 to 3-month period. This hypothesis was based on the longitudinal research conducted by Kross et al. (2013), who found that people who used Facebook more over a two-week time span showed a decrease in overall life satisfaction. Contrary to prior research, the results of the current study showed that a change in depression was only marginally predicted by social media intensity. However, anxiety was not impacted by social media predictor variables. The current findings compared with Kross' et al. (2013) findings may differ for a couple of reasons. First, the span of time between distributions of the survey was much longer (approximately 6-12 weeks longer) than the amount of time allotted by Kross et al. (2013). Another reason may be that the results may be subject to the participants' inaccurate estimates of their own social media activity, and the current data do not speak to changes in social media use that may have happened during the span between the two measurements.

Finally, the impact of social media behavior on the change in self-esteem over time was examined as an exploratory measure. Results showed that upward social comparison was associated with a change in self-esteem, meaning that the greater an individual engaged in upward social comparison on social media, the worse his or her self-esteem became over a 2 to 3-month span. This finding extends the research conducted by Vogel et al. (2014) who found that trait self-esteem was predicted by upward social comparison.

Overall, the findings of the study imply that social media behaviors such as social media use and intensity, FoMO, and social comparison may not have as strong as an impact on mental

health as prior research has shown. In fact, it appears that self-esteem is the major contributor to the relationships already established between the social media variables and mental health outcomes. Therefore, people with low self-esteem should be thoughtful when accessing social media and monitor how they use social media in order to avoid suffering from negative psychological outcomes.

As with other studies, the findings of the current study must be taken in light of limitations. One major limitation was the lack diversity among the participants. The participants were predominantly white, female, college students. Thus, the results of the current study may not be generalizable to men, people who of color, or people not enrolled in college. Future studies on social media should seek to capture a wider range of ethnicities, males, and ages to see if social media impacts their mental health in the same manner as it does for white female college students.

Another limitation of the study is the nature of self-reports. Self-reports may be subject to faulty memory and biases possibly influenced by self-enhancement strategies or participants' level of depression, anxiety, or self-esteem, potentially producing misleading information. Future studies should consider using measures in which participants' daily social media activities are not impacted by faulty memory, such as a diary design, and are more accurately monitored, such as requiring them to access social media through administered laptops or hand-held devices.

Finally, another possible limitation is that people who have used social media for a long time prior to participating in the current study may not show a change in depression or anxiety over the span of the current study because the change may have occurred prior to the administration of the two surveys. In other words, if a change in mental health were to occur and can be attributed to social media use or intensity, the maximum effect of social media on mental

health may have been reached prior to the participants completing the surveys. Thus, the results in the current study may not show the true longitudinal impact of social media. One way to overcome this obstacle is to obtain participants that are beginning to use social media and observe a change in their mental health over time relative to their social media use.

There are a few directions that future studies regarding the effects of social media on psychological well-being should focus on. One suggestion is the inclusion of a social anxiety measure. By adding a social anxiety measure to the literature, more implications regarding the impact of social media on mental health can be examined. Shaw, Timpano, Tran and Joormann (2015) found that social anxiety was positively associated with more time spent on Facebook and more frequent passive use of Facebook (browsing, non-interactive behaviors). McCord, Rodenbaugh, and Levinson (2014) found a positive relationship between social anxiety and interactive Facebook use among people who experience high anxiety on Facebook. Perhaps by extending the research through examining the role of self-esteem on social anxiety and social media, clarity regarding the impact of social media on social anxiety may be achieved. Another aspect that future studies should examine is the longitudinal impact of social media on young adolescents. As adolescence is a time of fundamental social identity development (Niwa, Way, and Hughes, 2014), it is important to develop research regarding the long term mental health risks of social media for young teens.

A major contribution of the present research is that it provides insight on how social media relates to an individual's mental health through the role of self-esteem. The current study found that the worse one's self-esteem is before engaging on social media, the more potentially harmful social media behaviors (upward social comparison, FoMO) an individual may engage in, which in turn can lead to the experience of greater depressive and anxious symptoms. Thus, the

current study holds important implications for social media users and, in particular, female college students who have low self-esteem. Future interventions should target the reduction of social media use among those who exhibit low self-esteem.

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Table 1

Means and Standard Deviations of All Variables Used in Data Analysis

Variable	*Mean*	*Standard Deviation*
Age	19.24	1.28
Gender	1.89	0.30
Social Media Intensity	3.51	0.91
Hours per week on social media	14.30	16.03
Depression (CESD)	1.91	0.52
Anxiety (GAD)	2.03	0.78
FoMO	2.21	0.73
Social Comparison General	3.24	0.65
Soc Comp Online, Non-directional	2.57	0.70
Soc Comp Online Upward	2.59	1.01
Soc Comp Online, Downward	2.47	0.79
Self-Esteem	3.27	0.80
CESD at Time 2	2.05	0.52
GAD at Time 2	3.18	0.80
Self-Esteem at Time 2	2.25	0.85

Table 2

Regression Results Predicting Depression (CES-D Scores) from Social Media Behaviors

Predictor	*Step 1 B (SE)*	*Step 2 B (SE)*	*Step 3 B (SE)*
Age	-.015 (.038)	-.014 (.032)	.036 (.023)
Gender	.336 (.163)*	.282 (.135)*	-.017 (.101)
Social Media Intensity	-.014 (.057)	-.061 (.054)	.058 (.041)
Hours per week on social media	-.002 (.003)	-.002 (.003)	-.002 (.002)
FOMO		.283 (.071)***	.056 (.055)
Social Comparison General		-.046 (.079)	-.054 (.057)
Soc Comp Online, Non-directional		-.179 (.072)*	-.053 (.053)
Soc Comp Online Upward		.247 (.045)***	.064 (.037)†
Soc Comp Online, Downward		-.023 (.053)	-.026 (.038)
Self-esteem			-.496 (.048)***
ΔR^2	.047	.360***	.292***

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 3

Correlations between Predictor Variables

		1-Age	2	3	4	5	6	7	8	9	10	11
2	Gender	.060										
3	Hours on Social Media	-.121	-.229*									
4	Social Media Intensity	-.242**	.009	.373***								
5	CESD	-.009	.205*	-.109	-.039							
6	Self-Esteem	.090	-.234*	.077	.112	-.819***						
7	GAD	.048	.136	-.040	.007	.800***	-.638***					
8	FoMO	-.026	-.018	.196*	.382***	.378***	-.404***	.413***				
9	Social Comparison General	.004	-.027	.191*	.237**	.178†	-.237**	.275**	.578***			
10	Soc Comp Online Non-Directoinal	.001	-.044	.169†	.441***	.052	-.054	.050	.471***	.474***		
11	Soc Comp Online Upward	-.017	.047	-.005	.126	.489***	-.504***	.327***	.391***	.375***	.436***	
12	Soc Comp Online Downward	.087	-.148	.070	.235**	-.007	-.002	.092	.194*	.275**	.255**	.183*

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 4

Regression Results Predicting Anxiety (GAD Scores) from Social Media Behaviors

Predictor	*Step 1 B (SE)*	*Step 2 B (SE)*	*Step 3 B (SE)*
Age	.028 (.059)	.016 (.052)	.076 (.046)
Gender	.337 (.249)	.315 (.222)	-.041 (.201)
Social Media Intensity	.016 (.088)	-.073 (.090)	.068 (.081)
Hours per week on social media	-.001 (.005)	-.002 (.004)	-.002 (.004)
FOMO		.458 (.117)***	.188 (.110)†
Social Comparison General		.090 (.131)	.080 (.113)
Soc Comp Online, Non-directional		-.282 (.119)*	-.133 (.106)
Soc Comp Online Upward		.185 (.074)*	-.032 (.074)
Soc Comp Online, Downward		.046 (.087)	.043 (.075)
Self Esteem			-.589 (.097)***
ΔR^2	.021	.265***	.183***

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 5

Regression Coefficients Predicting FoMO from Self-Esteem and Social Media Intensity

Variable	*Step 1 B (SE)*	*Step 2 B (SE)*
Age	-.003 (.053)	.092 (.044)*
Gender	.069 (.229)	-.346 (.189) †
Hours per week on social media	.009 (.004)*	.002 (.004)
Social Media Intensity (SMI)		.875 (.254)***
Self-Esteem (SE)		.046 (.253)
SE X SMI Intensity		-.154 (.074)*

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 6

Regression Coefficients Predicting Upward Social Comparison from Self-Esteem and Social Media Intensity

Variable	*Step 1 B (SE)*	*Step 2 B (SE)*
Age	-.006 (.074)	.076 (.064)
Gender	.158 (.318)	-.357 (.276)
Hours per week on social media	.000 (.006)	-.004 (.005)
Social Media Intensity (SMI)		-.077 (.372)
Self-Esteem (SE)		-1.037 (.371)***
SE X SMI Intensity		.097 (.108)

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 7

Regression Results Predicting Depression at Time 2 from Social Media Behaviors at Time 1

Predictor	*Step 1 B (SE)*	*Step 2 B (SE)*
Age	-.037 (.043)	-.045 (.048)
Gender	.282 (.231)	.228 (.242)
Hours per week on social media	.003 (.004)	.002 (.004)
Social Media Intensity	.134 (.058)*	.128 (.075) †
CESD at Time 1	.630 (.113)***	.532 (.196)**
Self-Esteem		-.097 (.132)
FOMO		-.090 (.113)
Social Comparison General		.108 (138)
Soc Comp Online, Non-directional		.074 (.095)
Soc Comp Online, Upward		-.003 (.073)
Soc Comp Online, Downward		-.067 (.073)
ΔR^2	.562***	.035

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 8

Regression Results Predicting Anxiety at Time 2 from Social Media Behaviors at Time 1

Predictor	*Step 1 B (SE)*	*Step 2 B (SE)*
Age	-.011 (.068)	-.048 (.072)
Gender	.314 (.351)	.199 (.356)
Hours per week on social media	.001 (.006)	.001 (.006)
Social Media Intensity	.212 (.094)*	.189 (.113)
GAD at Time 1	.782(.116)***	.663 (.165)***
Self-Esteem		-.195 (.179)
FOMO		-.270 (.168)
Social Comparison General		.466 (.206)*
Soc Comp Online, Non-directional		-.032 (.143)
Soc Comp Online, Upward		-.030 (.106)
Soc Comp Online, Downward		-.040 (.110)
ΔR^2	.629***	.061

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

Table 9

Regression Results Predicting Self Esteem at Time 2 from Social Media Behaviors at Time 1

Predictor	*Step 1 B (SE)*	*Step 2 B (SE)*
Age	.110 (.064)†	.139 (.067)*
Gender	-.536 (.339)	-.518 (.340)
Hours per week on social media	-.003 (.005)	-.005 (.005)
Social Media Intensity	-.116 (.085)	-.076 (.105)
Self-Esteem at Time 1	.738 (.108) ***	.623 (.141)***
FOMO		.072 (.160)
Social Comparison General		-.141 (.195)
Soc Comp Online, Non-directional		.049 (.131)
Soc Comp Online, Upward		-.201 (.099)*
Soc Comp Online, Downward		.066 (.103)
ΔR^2	.608***	.051

*** $p < .001$, ** $p < .01$, * $p < .05$, † $p < .10$

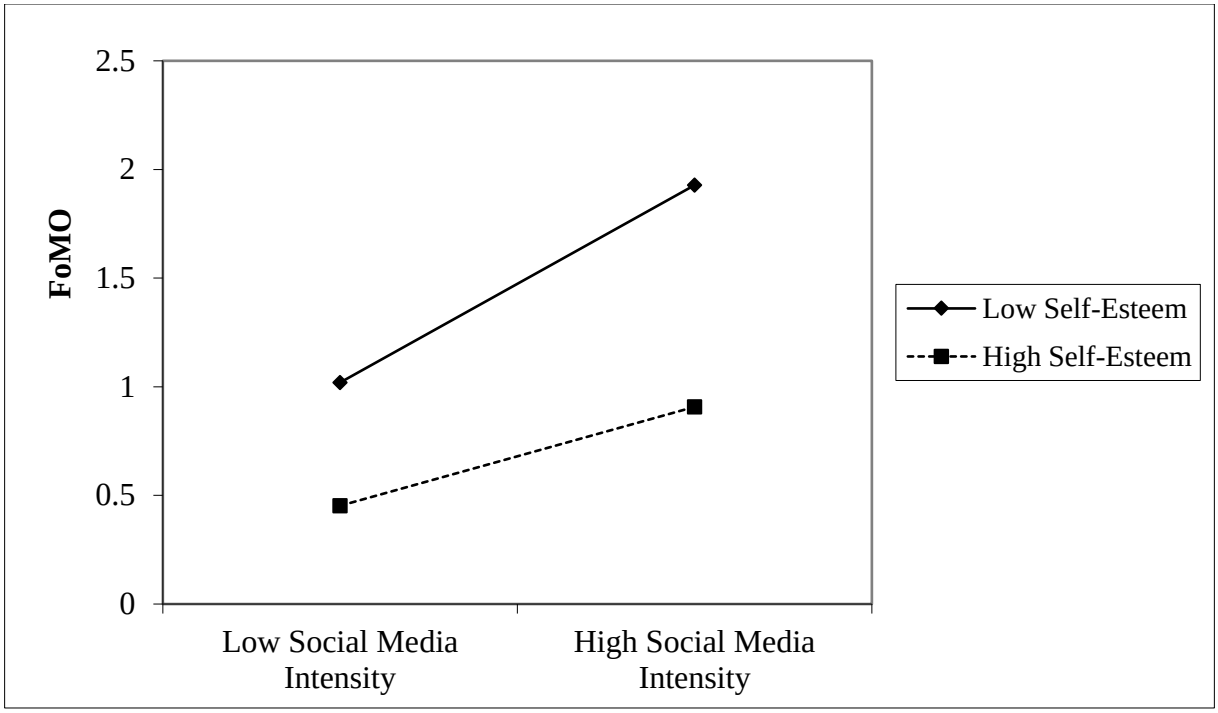

Figure 1. Associations between levels of social media intensity and levels of FoMO for individuals with low and high levels of self-esteem.

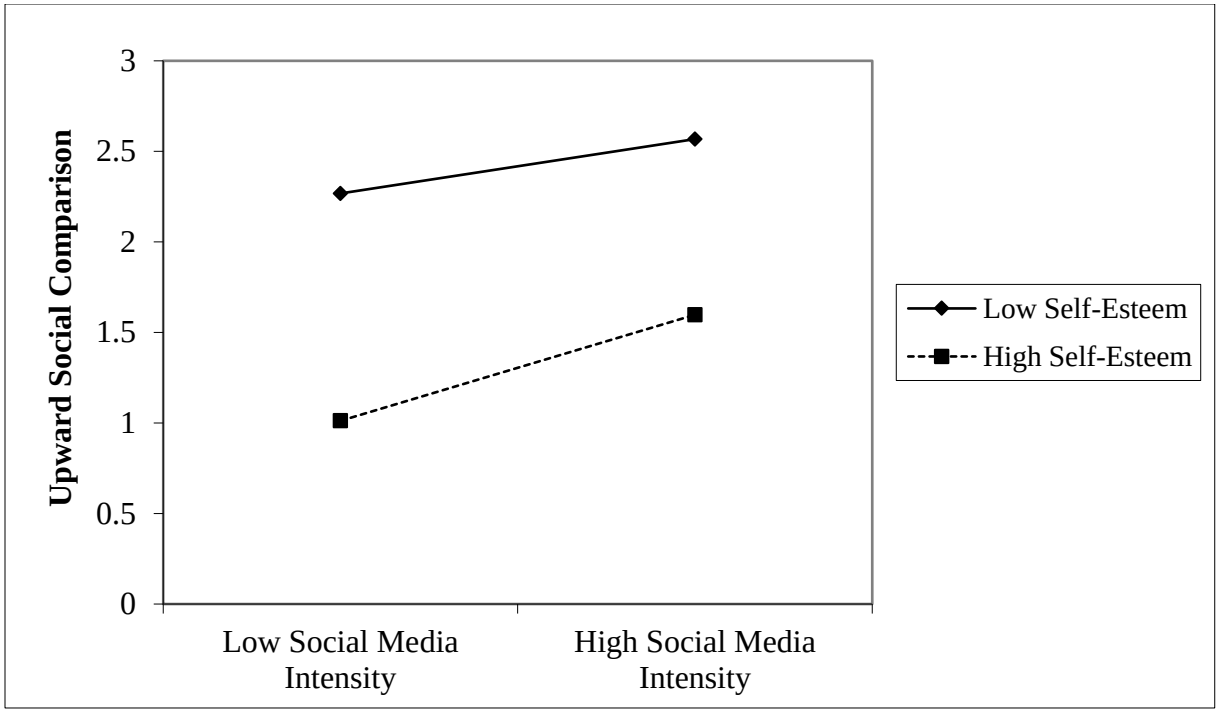

Figure 2. Associations between levels of social media intensity and levels of upward social comparison for individuals with low and high levels of self-esteem.