Claremont Colleges
Scholarship @ Claremont

Scripps Senior Theses

Scripps Student Scholarship

2016

Social Comparison and Self-Presentation on Social Media as Predictors of Depressive Symptoms

Janet L. Uhlir
Scripps College

Social comparison and self-presentation on social media
as predictors of depressive symptoms

by

Janet L. Uhlir

Submitted to Scripps College in partial fulfillment
of the degree of Bachelor of Arts

Professor Ma
Professor Wood

December 11, 2015

Abstract

Social media, an online arena for social behaviors such as self-presentation and social comparison, may have effects on users' mood and mental health. Favorably presenting oneself is linked to positive outcomes such as higher self-esteem, whereas social comparison, in general and specifically upward social comparison to higher-performing others, is related to feelings of inadequacy, envy, and depression. Social comparison may explain the "Facebook depression effect," acting as a mediator between time spent on social media and depressive symptoms. A correlational study is proposed that will ask 200 participants to report their time spent on various social media sites, self-presentation of themselves and their "friends," social comparison orientation, and depressive symptoms. Expected findings are that time spent on social media and the degree of others' perceived self-presentation will each be positively correlated with depression, and these relationships will be mediated by social comparison. This study will demonstrate that people feel depressed when they spend time on social media because they are frequently exposed to the self-enhancing images of others, which provides an opportunity for negative social comparison.

Keywords: social media, social comparison, depression, self-presentation

"Facebook depression" is a phenomenon that has captivated the media interest and led parents to fear for their children's mental health. The simple correlation between social network use and depression is not supported by a large amount of research (Jelenchick et al., 2012), so the media scare is largely overblown. However, it is possible that the research is not finding effects because it is not looking closely enough at the mechanisms behind feeling bad on Facebook. Users may post photos and statuses that reflect the most exciting parts of their lives, such as parties with friends and glamorous vacations, to create a flattering depiction of themselves. This practice is called positive self-presentation, and it can make individuals feel good about themselves (Kim & Lee, 2011). At the same time, using these constructed images for social comparison, the process of evaluating oneself based on information from others first observed by Festinger (1954), can lead to feelings of inadequacy. Sometimes self-presentation and social comparison behaviors on social media can have drastic consequences. For instance, the suicide of University of Pennsylvania student Madison Holleran was unexpected because her friends thought she was happy based on her social media presence (Fagan, 2015). This tragedy drew attention to the contrast between students' cheerful Instagram feeds and their hidden depression. The bombardment of idealized images on social media, combined with a tendency to negatively compare oneself to others, could produce depressive symptoms in social media users.

Social media, or social networks, are terms that typically encompass websites such as Facebook, Instagram, Myspace, Twitter, Snapchat, and Tumblr, which feature connecting with friends and sharing content in real time (Brunskill, 2013). Users often post information about their personal lives including statuses and photos. The term "social network" is distinct from the topic of this study in that it can also refer more generally to the network of friends and family that a person has in real life, not just on a particular website. Social media is very different from

other mass media technology such as television, in that the public are not only consumers of the

content, but producers and protagonists (Toma, 2013). Social media is popular in part because of

its psychological benefits, including increased social contact and sometimes higher self-esteem

resulting from changing one's own profile (Lup, Trub, & Rosenthal, 2015). However, it exposes

people to offensive behavior from other users known as cyberbullying, and the negative effects

of social network use on the individual psyche have also been studied, although not as

thoroughly (Brunskill, 2013). Some of these effects include low self-esteem, envy, loneliness,

and depression (Lup et al., 2015).

Depression is a common mood disorder that affects as much as 19% of the population

(Comer, 2013). Symptoms include sad mood, lack of motivation and activity, a negative self-

concept, self-punitive wishes, and decreases in sleep and appetite. Beck's cognitive theory for

the etiology of depression is called the cognitive triad, in which depressed people have negative

views and irrational beliefs about themselves, events, and the future, which mutually influence

each other (Beck & Weishaar, 2011, cited in Comer, 2013). From a behavioral perspective,

depression is perpetuated by the loss of motivation to do rewarding activities, which reduces

reinforcement from society, friends, and family. Depression is self-perpetuating, so it is difficult

to differentiate its causes and consequences. Clinical unipolar depression is predicted by a range

of biological, psychodynamic, and behavioral problems (Comer, 2013). But even just a cognitive

disturbance that causes someone to feel bad about themselves may lead to depressive symptoms

such as sadness and negative self-concept.

Self-presentation is defined as the behavior used to present information about the self to a

real or imagined audience (Michikyan, Dennis, & Subrahmanyam, 2014). Aside from the real

self, people can also choose to present their ideal self or false self on social media for the

purposes of deception, exploration, or impressing people (Michikyan et al., 2014). An image is the representation of an individual formed in the minds of others, created by the self-selection of material (Brunskill, 2013). Society has promoted the presentation of one's best side for centuries, but social media particularly lends itself to self-presentation because of the customizable profiles, the varying levels of anonymity and disinhibition, and the asynchronous nature of editable communication (Brunskill, 2013). Social networks provide an opportunity for more strategic and generalized self-presentations than face-to-face interaction. Personality traits such as extraversion and self-efficacy influence the type of information people put in their profiles. On the German social network StudiVZ, extraverts were more likely to have an attention-getting photo in their profile, and people with higher self-efficacy had more friends (Kramer & Winter, 2008). This suggests that those people who already have socially beneficial personality traits will be more likely to present socially desirable images and achieve social success.

The online image, known as a social avatar, takes on a life of its own that is influenced by the user's personality but dissociated from it (Brunskill, 2013). Websites such as Facebook often supplement real-life interactions, so people are held accountable for having online self-presentations that are mostly accurate (Toma, 2013). But this may not be true for other sites such as Twitter and Tumblr where interacting with strangers is more common. Discrepancies between the ideal self and real self can lead to devaluation of the self, and presentation of the false self is linked to low self-esteem and depression, as it is a strategic defense mechanism to prevent further loss of self-esteem (Michikyan et al., 2014). Conflict between the online image and the real identity may lead to psychological distress, pathological compartmentalization of aspects of the self, and upsetting comparisons to others' exaggerated lifestyles and measures of popularity.

Only in the online age are people exposed to such a deluge of their friends' ideal images. The social media feed of one's peers is rife with opportunities for social comparison.

In 1954, Leon Festinger published his theory of social comparison. His theory states that humans have an inherent drive to accurately evaluate their opinions and abilities. When objective evaluations are not available, people compare themselves to their peers. Social comparison can be classified into three groups that serve different purposes. Horizontal, or nondirectional, comparison is with those who are equal, and is the most useful for collecting information about the self. People are more likely to compare themselves to those who are more similar to them (Festinger, 1954). Downward social comparison is the act of comparing oneself to those who are perceived as being lower-performing in the area of comparison, and this is used to improve self-esteem. In Western culture, it is desirable to be slightly above average and to constantly improve one's abilities, which Festinger called the unidirectional drive upward (Festinger, 1954). Upward social comparison, or negative social comparison, is comparing oneself with people considered to be higher-performing. It can be motivating, but it usually leads to feelings of inadequacy. Research shows that people who experience depressive episodes are more likely to practice social comparison and experience a decrease in positive affect as a result of upward social comparison (Bäzner, Brömer, Hammelstein, & Meyer, 2006).

In contrast to the negative effects of social comparison, the act of creating a socially appealing self-presentation is reinforced by improvements in mood and self-esteem as well as social approval. Facebook can in some ways increase subjective well-being when people use it for positive self-presentation (Kim & Lee, 2011). Higher numbers of Facebook friends were correlated with higher subjective well-being, but the effect was not mediated by perceived social support, because Facebook "friendships" are often superficial. There was a negative curvilinear

relationship between the number of friends and perceived social support, such that people with very few friends perceived themselves as having low social support, as did those with many superficial friendships. Additionally, Kim and Lee (2011) investigated the difference between positive and honest self-presentation in their effects on these variables. Positive self-presentation, selecting only socially desirable images to share on one's social network page, was directly positively correlated with subjective well-being because it helps people affirm positive views of themselves. Honest self-presentation, revealing the negative aspects of one's life, had a significant indirect relationship with well-being mediated through social support, because being open about one's struggles attracts support from friends. This finding about how Facebook can make people happy also implies that people who use Facebook to make many shallow friendships and present themselves favorably lack genuine social support. Additionally, this study does not take social comparison into account; even if an individual's socially desirable self-presentation makes them happy, seeing someone else's may have the opposite effect.

The creation of a favorable Facebook profile is motivated by self-presentational concerns as well as self-affirmation, emphasizing good aspects of the self and boosting self-esteem (Toma, 2013). Using an implicit association task, Toma (2013) found higher self-esteem in participants who had viewed their own Facebook profile compared to those who had viewed the profile of a stranger from the sample. On the other hand, this study also found that self-affirmed participants did worse on a cognitive task (i.e. made more errors and attempted fewer answers in a serial subtraction problem) than did participants who did not have the self-affirmation manipulation. Self-affirmation reduces the motivation to perform well, an activity that also improves self-worth (Toma, 2013).

Studies have shown that performing poorly increases the vulnerability to upward social comparison. After receiving public negative feedback, people are surprisingly more likely to make upward social comparisons due to self-presentational concerns (Whitehead & Smith, 1986). In this study, participants filled out a bogus test, were told that their score was the middle out of seven, and then reported which other rank they thought was most similar to them and which scores they wanted to see. In the private condition, they would be shown the scores by someone who knew nothing about the study. In the public condition, the experimenter and the other participants would see which score they had chosen as most similar. More participants in the public than private conditions chose to compare themselves to someone who scored higher. Expressing similarity to a higher ranked person served the need for favorable self-presentation. The desire for positive self-presentation overrides the threat to self-esteem and leads them to present themselves as being more similar to higher-performing others. Upward social comparison and other denigrating experiences also increase self-presentational concerns; this is called compensatory self-presentation (Tyler, 2009). According to this study, which also used bogus test feedback given in the form of comparisons, compensatory self-presentation is more likely to happen when the feedback is given publicly than privately. Either way, upward social comparison and self-presentation are connected.

Some research supports the hypothesis that use of Facebook is linked to depressive symptoms via the mediator of social comparison (Steers, Wickham, & Acitelli, 2014). Facebook is a popular social network that allows users to "friend" each other, usually people they know, see their posts in a news feed, and "like" posts and pages. Twenty five percent of Facebook profiles express depressive symptoms in their status updates. At the same time, the general trend is that Facebook users post the most self-enhancing content on their profiles. Posting this content

may boost one's own well-being, but viewing large quantities of friends' ideal representations leads to negative emotions and the feeling that one is alone in those negative emotions. The researchers adapted the general social comparison orientation measure, the INCOM (Gibbons & Buunk, 1999), to measure social comparison activity on Facebook and called the new scale the Comparison Orientation Measure-Facebook (COM-F, Steers et al., 2014). In a study of 180 university students, time spent on Facebook was correlated with depressive symptoms measured on the CES-D, and with social comparison measured on the COM-F. However, social comparison was significantly related to depressive symptoms only for males, so the mediation path from social media time to depression through social comparison was supported for males but not for females.

It would make sense that upward social comparison would be the most likely to lead to feelings of dejection, while downward social comparison would be linked to higher self-esteem and positive feelings. However, in their second study of 152 university students, Steers et al. (2014) found that the act of social comparison itself is linked to depression. They modified the COM-F to create subscales for upward, nondirectional, and downward social comparison. Analyzed separately, all were significant mediators of the relationship between Facebook use and depression. The reverse causation hypothesis, that depressed individuals log on to Facebook more and practice more social comparison as a result, was not supported. The model that Facebook use leads to depressive symptoms through the mediator of social comparison was the best fit to the data, although this is a correlational study and no causal claims can be made.

People who suffer from depression are more likely to feel envious when socially comparing themselves on Facebook, especially to attractive profiles (Appel, Crusius, & Gerlach, 2015). This quasi-experimental study categorized 89 adult German participants as depressed or

control based on their scores on the Beck Depression Inventory, and then showed them Facebook profiles that were designed to be attractive or unattractive. Participants were then asked questions about the profile owner's absolute and comparative happiness (these were measures of social comparison) and about the participant's own envy. Comparative and absolute happiness ratings were higher for the attractive profiles, but there was no difference between depressed and non-depressed participants in ratings of absolute happiness. Depressed participants rated both profiles as happier than themselves, significantly higher than did control participants, and reported higher feelings of inadequacy or inferiority than did control participants. There were significant main effects and interaction for the effect of depression and profile attractiveness on envy. Depressed participants felt more envious than did control participants, and both groups felt more envious of the attractive profile owner than the unattractive profile owner. The interaction was demonstrated by the envy reaction to the attractive profile being more pronounced in the depressed group than the control group. Depression was also correlated with envy, lower self-esteem, and negative social comparison operationalized as thinking the profile owner was happier than themselves.

Instagram is a newer social network site based on sharing photos. Unlike Facebook, leaving personal details out of profiles and following strangers are common practices on Instagram. Like Facebook, use of it may contribute to feelings of depression. Number of strangers followed was a moderator in the mediated model relating social network use, social comparison, and depressive symptoms (Lup, Trub, & Rosenthal, 2015). Following strangers can lead to feeling that others have better lives, and passive viewing of friends' activities evokes jealousy and loneliness. In this study, 117 participants ages 18 to 29 reported their time spent on Instagram and number of strangers followed, and completed the Social Comparison Rating Scale and the CES-D depression scale. Results supported the relationship between Instagram use and

depressive symptoms as mediated by social comparison, and strangers followed as a moderator of the relationship between Instagram use and social comparison. At the 10th percentile of strangers followed only, users practiced positive or downward social comparison and felt good about their lives compared to people they saw on Instagram. At the 75th and 90th percentiles of strangers followed, there were nonsignificant trends relating Instagram use and negative social comparison. The correlation between Instagram use and depressive symptoms was only positive and significant at the highest percentiles of strangers followed. This study also tested the reverse causation hypothesis with depression as the predictor, strangers followed as the moderator, and Instagram use and social comparison each as the mediator and outcome. Neither of these alternative models are significant, supporting the model that Instagram use predicts depressive symptoms through the mediator of social comparison, and that strangers followed moderates this effect.

Despite the pressure to post the most appealing content and create a flawless virtual self, signs of depression and suicide can also be detected in users' social media activity. Twitter may be useful for tracking suicide risk (Jashinsky, Burton, Hanson, West, Giraud-Carrier, & Barnes, 2014). Twitter posts called "tweets" are limited to 140 characters, and users can follow other users, including their friends and celebrities, to see their tweets. The researchers measured the suicidal content and locations of tweets, and found that the number of suicidal tweets correlated with the previously measured suicide rate in states across the U.S. A problem with this study is that the tweets and suicides were not linked in real time, but the researchers make the point that suicide rates tend to be stable over time. Additionally, the social media activity of depressed people looks different in subtler ways than their language (Park, Lee, Kwak, Cha, & Jeong, 2013). Using a Facebook app that asked participants to answer questions on the BDI and CES-D,

Park et al. (2013) found a negative correlation between depression scores and number of friends and location tags. These results indicate that people are suffering from depressive symptoms on social media, and it is important to investigate potential causes.

Social media users and researchers are familiar with the phenomenon that people tend to post the most socially desirable parts of their lives on their profiles in order to create an ideal representation of themselves. Negative emotions result from upward social comparison, linking social media use and depressive symptoms. Even though these ideal images play a crucial role, it is hard to find research relating self-presentation on social media to social comparison and depression. The current project will investigate whether the prevalence of other people's self-enhancing images on one's social media feed contributes to social comparison, which in turn mediates the effect of social media use on depression.

For the proposed study, participants recruited through ads on social media sites will report their social media use and answer self-report scales measuring social comparison and depression. The hypothesis supported by prior research, that there is a positive correlation between social media use and depressive symptoms mediated by social comparison, will be tested (Steers et al., 2014). In addition, participants will answer questions about how much they and others represent themselves favorably on social media. One's own positive self-presentation should be negatively correlated with depression (Kim & Lee, 2011), positively correlated with social comparison (Whitehead & Smith, 1986), and positively correlated with report of others' self-presentation (Brunskill, 2013; Lup et al., 2015). The perception of others' self-presentation should be positively correlated with depression and social comparison. Finally, there should be a mediation relationship similar to that of social media time, in which social comparison mediates the relationship between others' self-presentation and depression.

Proposed Method

Participants

Most research in this field was conducted on 100 to 200 participants, most of whom were social media users (Appel et al., 2015; Lup et al., 2015; Steers et al., 2014), so this study will need a comparable sample size. Assuming a small to medium effect size for the association between social comparison and depression as found by Appel et al. (α=.05, η^2=.26, 2015), a sample size of 200 is appropriate for a correlational study based on power analysis (Cohen, 1992). When the survey is long and contains several measures, like the present study, there is the risk of participants dropping out and not completing the survey, so more than 200 participants will be recruited in order to have enough to analyze after accounting for missing data. Participants will be legal adults, over the age of 18, from the United States. Ideally, the sample will be approximately 50% male and 50% female, although it will most likely be majority female as in the studies referenced above. It should also have racial demographics that are equal to those of the population of social media users in America, although race information will not be collected. Participants will be recruited using ads purchased on social media sites including a link that leads to the study. However, this limits variability in the social media use of the participants because those who are likely to click on the ads are likely to be more active users. To get a wider variety of participants who might not use social media, but can still access the Internet to take the survey, recruitment will also use advertisements on other sites such as Google. The advertisements will promote the compensation, entry into a raffle for a $50 Amazon gift card, and two of these prizes will be emailed to random participants after the survey is closed.

Materials

      Social media use. Participants will self-report their social media activities. First, they will report how many hours per day they spend on social networking sites overall. Then, they will report whether they use each of several of the most popular social media websites (Facebook, Instagram, Twitter, Tumblr). Answering "yes" to a certain social media question will reveal a question about how many hours per day they spend on that particular site, for a total of nine questions.

      Self-presentation. Participants will also answer two questions about their own self-presentation and that of their friends or people they follow (Appendix 1). These questions will be answered on a 7-point Likert scale from 1=never to 7=always. The questions in this section will be analyzed separately and not as part of a scale.

      Social comparison. The trait tendency of an individual to practice social comparison will be measured by the Iowa-Netherlands Comparison Orientation Measure (INCOM, Gibbons & Buunk, 1999). Participants will indicate how much they agree with each of the items. The scale consists of 11 items with responses provided on a 5-point Likert scale from 1=I disagree strongly to 5=I agree strongly. It is reliable, with a Cronbach's α of .83, and validated by several empirical studies and correlations with other theoretically related measures (Gibbons & Buunk, 1999).

      Depression. The Beck Depression Inventory (BDI, Beck, Ward, Mendelson, Mock, & Erbaugh, 1961) will be used to measure depressive symptoms. The original form of the BDI has 21 items, on which participants pick one of 4 or 5 statements, labeled 0 to 3, that reflect levels of depression from low to high. Numerical scores are then added up and compared to ranges

representing no, mild, moderate, or severe depression. Validity tests were conducted on mental hospital patients, and there was a high correlation between patients' scores on the scale and psychiatrists' ratings of their depression over time (Beck et al., 1961).

Gender. Gender is a potential confound in studies of social comparison and depression online (Steers et al., 2014), so participants will answer the question "What is your gender?" with "male," "female," or "other (please specify)." Because gender priming can affect responses, this question will be asked last.

Procedure

Participants will click on the link in the advertisement and be directed to the informed consent form. After confirming that they are over 18 years of age and giving their consent, participants will be directed to the survey. Then they will complete the social media use questions, the self-presentation questions, the INCOM, and the BDI. The sections will be counterbalanced to control for priming and order effects. Finally, participants will be asked about their gender. After completing the questions, participants will be debriefed. At the end of the study, participants will be directed to a different survey to enter their email address in order to be entered into a raffle to win a gift card.

Ethics

This study is minimal risk. It is conducted online via a survey, and does not collect identifying information. It does not put participants in any physical danger. Emotional discomfort is a potential risk of this study because participants will answer questions about depression, but the discomfort is not more than what is encountered in everyday life. On the

other hand, participants in the study could benefit from the debriefing form, which will describe the relationship being investigated. Participants could possibly change their social media habits if they learn that social media is having a negative effect on their mental health. Another benefit is greater scientific knowledge about self-presentation and social comparison and how these phenomena relate to people's experiences on social media, particularly as they affect depressive symptoms. Results of a study like the one proposed could shed light on the behaviors of depressed social media users and the ways in which they are vulnerable, which could lead to development of intervention methods that help people get counseling and even prevent suicide.

Research on social media behaviors related to depression is particularly useful because depression on social media can be hard to detect. Evidence of this fact is shocking suicides by people who appeared completely happy on their Facebook and Instagram accounts (Fagan, 2015). This study could benefit society as a whole if it became popular knowledge, because social media users could learn the signs of their friends becoming depressed, help them if necessary, and develop ways to make the social media community more honest and mental health-positive.

Personal health information will not be collected, as a person's level of depression can be measured with scales in place of a clinical diagnosis. However, the scales do ask participants to reflect on their depression, which is a sensitive topic, and contain phrasing that is very evocative of depressive feelings. It is possible that thinking about social comparison and self-presentation will also trigger these feelings. This is necessary in order to study depression and factors that relate to it, as is evident in the large amount of studies that use scales such as the Beck Depression Inventory or the CES-D. Participants may feel uncomfortable, but most likely not more so than they would normally feel if they have depression. Participants will be told in the

informed consent form that they can leave the study at any time if they feel uncomfortable. If they complete the study but still feel unhappy, resources included in the debriefing form should help them deal with depressive feelings.

This study should be minimal risk to all participants, including those in protected populations. The sample should be inclusive of all genders and races in the social media user population, including women and minorities. There is no reason to exclude them and it is more desirable to include them, although they are technically protected populations. The survey may ask demographic questions about gender, but there is no particular measure that would put participants at risk because of their identity. There are no other protected populations in the study.

There is no deception in this study. Participation is voluntary. From clicking on the link to the survey, to giving informed consent, to completing the measures, participants can choose not to participate at any time. Participants will receive a small, non-coercive compensation. This study will be anonymous to protect participants. They will find the study via Facebook and other social media websites, but the survey will not be an app on these sites, so participants' responses to the study are not linked to their personal accounts. Anonymity will be ensured by making sure that the survey software does not collect IP addresses. Overall, participants will experience no more risk than they typically do online. Therefore, the benefits of this study outweigh the risks, so it should be ethical to perform.

Proposed Results

Data Preparation

Participants' responses from the INCOM and BDI will be summed to form their

composite scores as recommended for the respective scales (Gibbons & Buunk, 1999; Beck et

al., 1961). It is not ideal, but possible that the sampling method will select more active social

media users and thus the distribution of time spent on social media may be negatively skewed.

Normality tests like Shapiro-Wilk's W will be conducted, and if a significant normality problem

is found, transformations will be used.

Social Media Time

Correlation and linear regression will be used to test the relationships among social media

time, social comparison, and depression. There will be a positive correlation between time spent

on social media and depression. Gender is likely to have an interaction with social media and

depression (Steers et al., 2014), so it will also be included as a predictor to control for its

confounding effect. Analyses will be conducted overall using the total time spent on social media

variable, and for each social networking site, using the time participants reported spending on the

sites individually. All social media site times are expected to show significant correlations with

depression. People who go on social networking sites frequently are more likely to experience

depressive symptoms, and one possible explanation for this is that they compare themselves to

others and feel inadequate (Steers et al., 2014).

The method specified by Baron & Kenny (1986) will be used to test whether social

comparison mediates the effect of social media use on depression (Figure 1). First, there should

be a significant correlation between social media time (overall and individual) and depression, as

established above. Next, there should be a significant correlation between social media time and the mediator, social comparison orientation as measured on the INCOM. There should also be a significant correlation between social comparison and depression. Finally, in a multiple regression with social media time and social comparison as predictors of depression, the social comparison path should be significant, and the social media time path should be weaker than in the first analysis, or become nonsignificant.

Self-Presentation

The correlation between participants' ratings of their own and others' self-presentation will be tested. It is expected that there will be a significant positive correlation, because individuals' self-presentation could be motivated by peer pressure (Brunskill, 2013). Additionally, others' self-presentation should be positively correlated with time spent on social media, because one is likely to see more of these images when spending more time on social media.

Participants' frequency of self-presentation will also be negatively correlated with depression, as the act of creating one's own positive image has been shown to be self-affirming. However, it should be positively correlated with social comparison (Whitehead & Smith, 1986). The perceived frequency with which their friends or people they follow perform positive self-presentation will be positively correlated with social comparison and depression, because a higher rating on this question will show that they pay attention to what others post and may tend to use it as self-evaluating information, and the favorable content of these posts may lead them to feel inferior.

Once the correlation between social media time and depression mediated by social comparison has been supported, this study intends to test whether exposure to others' self-enhancing images has a similar mediated effect. Multiple regression will be used to test whether the relationship between perceived others' self-presentation, social comparison, and depressive symptoms meets the criteria for mediation (Figure 1). First, a significant correlation between perceived others' self-presentation and depression must be established. Then, there should be a significant correlation between perceived others' self-presentation and social comparison. Next, social comparison should be positively correlated with depression, as established in the previous analysis. Finally, in a multiple regression with social comparison and perceived others' self-presentation as predictors of depression, the social comparison path should be significant, and the self-presentation path should be weaker than in the first analysis, or become nonsignificant.
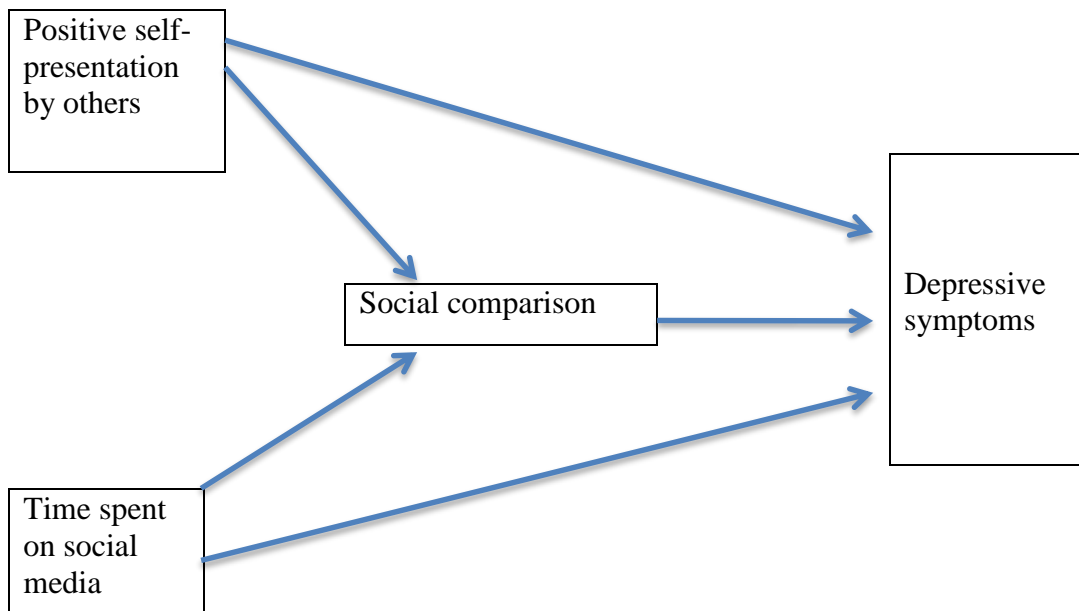
Figure 1: Predicted mediation relationships between variables.

Discussion

Spending time on social media is likely to be correlated with depression, mediated by social comparison. Likewise, frequently seeing others' self-enhancing posts on social media is likely to have a social comparison-mediated, positive relationship to depression. On the other hand, participants' own levels of favorable self-presentation are expected to be negatively correlated with depression. In terms of social media behavior, this means that many social media users are motivated to post self-enhancing content, and frequently see such content from other people on their feeds in turn. This could potentially lead to social comparison of oneself with these images and feeling inferior. The tendency to compare oneself to others is expected to be positively correlated with depressive symptoms. Overall, the relationships studied explain that social media can be beneficial to those who use it for self-affirming purposes, but harmful to those who use it for social comparison, and that those two behaviors feed off of one another on social networks.

Limitations

One major limitation of this study is that it is correlational, so causal claims cannot be made based on the results. The correlational study with scales measuring the constructs of interest was chosen in order to protect participants. It was difficult to come up with an experimental design to test these hypotheses for ethical reasons. Because social comparison on social networking sites is linked to depressive symptoms, it is possible that exposing participants to experimental manipulations in order to measure their emotional reactions would be harmful. Such experiments have been conducted (Appel et al., 2015), and presumably the researchers

considered their debriefing to be enough to undo any emotional harm that may have been caused by the depressing stimuli.

Another limitation is the scales used. The Beck Depression Inventory and the Iowa-Netherlands Comparison Orientation Measure were chosen because they are well-known, validated and reliable measures of depression and social comparison, respectively. However, the BDI has undergone many revisions and studies, so it was difficult to find consistent information about whether it is still considered a good measure of depression. By definition, it is intended to measure depressive symptoms, and these are not the only states that need to be examined in relation to social media. General well-being scales that measure both positive and negative affect might be more useful, because the consequences of self-presentation and social comparison on social media are complex. For social comparison, the INCOM is not the perfect scale because it only measures social comparison orientation overall, not upward, downward, and horizontal. It would be useful to find a measure for the different types of social comparison, as they are known to have different effects.

Because social desirability is a factor in what people choose to post online, the study of social media self-presentation may have a problem with social desirability bias in self-reporting. For this reason, it might be informative to view participants' profiles to gather data about variables such as self-presentation and depression. The users' profiles might be a more valid source of information because self-reports are subject to bias. People may often represent themselves more favorably and compare themselves to others, but report that they do not. However, studying users' profiles would not be anonymous and would collect identifying information on participants. It would be ethical to perform such a study with users' permission, but participants who are willing to have their profiles examined by researchers might exhibit a

self-selection bias, resulting in similar levels of bias as with self-report. In the current climate there is some expectation that social media profiles remain semi-private. It would be inappropriate for a researcher to "friend" the participants or save their posts unless it is with their permission. Again, studies on users' profiles have been conducted, some even including photos, first names, and group names in the paper (Kramer & Winter, 2008), and it would be ethical if the data were kept confidential.

These issues cannot be reasonably addressed in this study because it is intended to be an exploratory study to investigate a new relationship between variables. In order to get a fairly wide and representative sample of social media users via advertisement recruiting, the survey needs to be completed quickly and cause as little inconvenience to the participants as possible. The questionable ethics of a potentially distressing experimental manipulation or collecting personal data did not seem justified. Both of these improvements could be done in future studies. In particular, privacy expectations are decreasing as widely sharing information on social media becomes more popular, and perhaps a psychological study of profiles would be commonplace in a few years. At the present time, the study needs to protect privacy in order to encourage participation.

Future Directions

Social media use produces an array of emotions, some of them positive, such as the self-affirmation and self-esteem boost that comes from creating and viewing one's own profile (Kim & Lee, 2011). In addition, it is possible that people's own self-presentation gives them the perspective to understand that social media presentations are not accurate, and defend themselves from the negative effects of social comparison. It would be interesting to investigate whether the

positive effects of self-presentation counteract the negative effects of social comparison. On the other hand, it is possible that favorable self-presentations produce negative emotions as a result of dissociation of the identity from the ideal image. Yet another hypothesis is that people who are depressed compensate for their negative emotions by presenting a positive image on social media. More research is needed on how self-presentation reflects the emotional state of the individual, because this is likely to be a complex effect.

This study does not specify hypotheses about the differences in depression, social comparison, self-presentation, or the relationships thereof between the different social media sites, Facebook, Twitter, Tumblr, and Instagram. This is because there is no research currently that examines such differences from which to predict the results. Comparative studies of social networking sites are an important direction for future research, because some of them might pose a higher risk for depression than others depending on the degree to which they facilitate self-presentation and social comparison.

Steers et al. (2014) found that all kinds of social comparison, not just upward social comparison, were mediators of a connection between social media use and depression, and this was the basis of the hypothesis in this study. However, it would be interesting to study the effects of upward social comparison alone. It is expected that most of the presentations seen on social media are favorable, and that most of the social comparison taking place is upward, so isolating this particular behavior might improve the hypotheses.

This research on the link between social media use and depression mediated by social comparison demonstrates a need for intervention. In the future, programs should be developed that can detect depression in social media postings and provide users with the resources they need to cope with their emotional problems. Experimental tests should be performed on such

intervention programs to find out whether they improve social media users' mental health. Social comparison and favorable self-presentation are natural and reinforced human behaviors, so it is unlikely that any amount of research or media fear-mongering will stop people from using social media for these purposes. More research needs to be done on the benefits of social media, and encouraging people to practice healthy behaviors online and avoid unhealthy ones.

Conclusion

This exploration of the mechanisms behind depression on social networking sites should reduce some of the media paranoia about the dangers of the internet. Social media is a platform for common human behavior, but it makes tools for self-presentation and targets for social comparison available more widely than ever before. This research should make people aware of how their social media behavior puts them, and possibly others, at risk of depressive symptoms. The social media culture is currently a competition of managing one's online image and comparing oneself to others. Research on these topics has important implications for changing that culture to one that is more supportive and a positive influence on mental health.

References

Appel, H., Crusius, J., & Gerlach, A. L. (2015). Social comparison, envy, and depression on

Facebook: A study looking at the effects of high comparison standards on depressed

individuals. *Journal of Social and Clinical Psychology, 34*(4), 277-289.

doi:10.1521/jscp.2015.34.4.277

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social

psychological research: Conceptual, strategic, and statistical considerations. *Journal of

Personality and Social Psychology*, *51*(6), 1173-1182. doi:10.1037/0022-3514.51.6.1173

Bäzner, E., Brömer, P., Hammelstein, P., & Meyer, T. D. (2006). Current and former depression

and their relationship to the effects of social comparison processes. Results of an internet

based study. *Journal of Affective Disorders*, *93*(1-3), 97-103.

doi:10.1016/j.jad.2006.02.017

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for

measuring depression. *Archives of General Psychiatry*, *4,* 561-571.

Brunskill, D. (2013). Social media, social avatars and the psyche: Is Facebook good for us?

Australasian Psychiatry, 21(6), 527-532. doi:10.1177/1039856213509289

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Comer, R. J. (2013). *Abnormal Psychology* (8th ed.). New York: Worth Publishers. pp. 223-315.

Fagan, K. (7 May 2015). Split image. *ESPN.* Retrieved from

http://espn.go.com/espn/feature/story/_/id/12833146/instagram-account-university-

pennsylvania-runner-showed-only-part-story☐

Festinger, L. (1954). A theory of social comparison processes. *Human Relations*, *7,* 117-140.

doi:10.1177/001872675400700202

Feinstein, B. A., Hershenberg, R., Bhatia, V., Latack, J. A., Meuwly, N., & Davila, J. (2013). Negative social comparison on Facebook and depressive symptoms: Rumination as a mechanism. *Psychology of Popular Media Culture*, *2*(3), 161-170. doi:10.1037/a0033111

Gibbons, F. X., & Buunk, B. P. (1999). Individual differences in social comparison: Development of a scale of social comparison orientation. *Journal of Personality and Social Psychology*, *76*(1), 129-142. doi:10.1037/0022-3514.76.1.129

Jashinsky, J., Burton, S. H., Hanson, C. L., West, J., Giraud-Carrier, C., Barnes, M. D., & Argyle, T. (2014). Tracking suicide risk factors through Twitter in the US. *Crisis: The Journal of Crisis Intervention and Suicide Prevention*, *35*(1), 51-59. doi:10.1027/0227-5910/a000234

Jelenchick, L. A., Eickhoff, J. C., & Moreno, M. A. (2013). 'Facebook depression?' Social networking site use and depression in older adolescents. *Journal of Adolescent Health*, *52*(1), 128-130. doi:10.1016/j.jadohealth.2012.05.008

Kim, J., & Lee, J. R. (2011). The Facebook paths to happiness: Effects of the number of Facebook friends and self-presentation on subjective well-being. *Cyberpsychology, Behavior, and Social Networking*, *14*(6), 359-364. doi:10.1089/cyber.2010.0374

Krämer, N. C., & Winter, S. (2008). Impression management 2.0: The relationship of self-esteem, extraversion, self-efficacy, and self-presentation within social networking sites. *Journal of Media Psychology: Theories, Methods, and Applications*, *20*(3), 106-116. doi:10.1027/1864-1105.20.3.106

Lup, K., Trub, L., & Rosenthal, L. (2015). Instagram #instasad?: Exploring associations among Instagram use, depressive symptoms, negative social comparison, and strangers followed.

Cyberpsychology, Behavior, and Social Networking, 18(5), 247-252.

doi:10.1089/cyber.2014.0560

Michikyan, M., Dennis, J., & Subrahmanyam, K. (2015). Can you guess who I am? Real, ideal, and false self-presentation on Facebook among emerging adults. *Emerging Adulthood*, *3*(1), 55-64. doi:10.1177/2167696814532442

Park, S., Lee, S. W., Kwak, J., Cha, M., & Jeong, B. (2013). Activities on Facebook reveal the depressive state of users. *Journal of Medical Internet Research*, *15*(10), 163-177. doi:10.2196/jmir.2718

Radloff, L. S. (1977). The CES-D scale: A self-report symptom scale to depression scale in the general population. *Applied Psychology Measures, 1*(3), 385-401.

Scelfo, J. (2015, July). Suicide on campus and the pressure of perfection. *The New York Times.* Retrieved from http://www.nytimes.com/2015/08/02/education/edlife/stress-social-media-and-suicide-on-campus.html

Steers, M. N., Wickham, R. E., & Acitelli, L. K. (2014). Seeing everyone else's highlight reels: How Facebook usage is linked to depressive symptoms. *Journal of Social and Clinical Psychology, 33*(8), 701-731. doi:10.1521/jscp.2014.33.8.701

Toma, C. L. (2013). Feeling better but doing worse: Effects of Facebook self-presentation on implicit self-esteem and cognitive task performance. *Media Psychology*, *16*(2), 199-220. doi:10.1080/15213269.2012.762189

Tyler, J. M. (2009). Compensatory self-presentation in upward comparison situations. *Human Communication Research*, *35*(4), 511-533. doi:10.1111/j.1468-2958.2009.01361.x

Whitehead, G. I., & Smith, S. H. (1986). Self-presentation as a determinant of upward comparison. *Representative Research in Social Psychology*, *16*(2), 5-14.

Appendix 1: Questions

Social media use

How many hours per day do you spend on social media overall?

Do you use Facebook?

      How many hours per day do you spend on Facebook?

Do you use Instagram?

      How many hours per day do you spend on Instagram?

Do you use Twitter?

      How many hours per day do you spend on Twitter?

Do you use Tumblr?

      How many hours per day do you spend on Tumblr?

Self presentation

How often do you represent yourself favorably on social media?

How often do you see your friends/people you follow represent themselves favorably on social

media?

Social comparison

Iowa-Netherlands Comparison Orientation Measure (Gibbons & Buunk, 1999)

142   GIBBONS AND BUUNK

Appendix

Items and Factor Loadings for the Iowa-Netherlands Comparison Orientation Measure

Item	Factor 1	Factor 2
1. I often compare how my loved ones (boy or girlfriend, family members, etc.) are doing with how others are doing	.78	.01
2. I always pay a lot of attention to how I do things compared with how others do things	.67	.12
3. If I want to find out how well I have done something, I compare what I have done with how others have done	.61	.12
4. I often compare how I am doing socially (e.g., social skills, popularity) with other people	.60	.29
5. I am not the type of person who compares often with others (reversed)	.57	.45
6. I often compare myself with others with respect to what I have accomplished in life	.54	.30
7. I often like to talk with others about mutual opinions and experiences	.10	.76
8. I often try to find out what others think who face similar problems as I face	.30	.74
9. I always like to know what others in a similar situation would do	.34	.61
10. If I want to learn more about something, I try to find out what others think about it	.12	.57
11. I *never* consider my situation in life relative to that of other people (reversed)	.15	.51

Note. Loadings were based on a principal-components analysis with varimax rotation on the first American sample ($N = 403$ adolescents; M age = 17 years). Items were preceded by the statement "Most people compare themselves from time to time with others. For example, they may compare the way they feel, their opinions, their abilities, and/or their situation with those of other people. There is nothing particularly 'good' or 'bad' about this type of comparison, and some people do it more than others. We would like to find out how often you compare yourself with other people. To do that we would like to ask you to indicate how much you agree with *each* statement below, by using the following scale." The accompanying 5-point scale ranged from *I disagree strongly* (1) to *I agree strongly* (5).

Depressive symptoms

Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961)

Prompt: Select the statement that best fits you at the present time.

of the well known variability of psychiatric diagnoses, it is necessary to have some other consistent standard against which the inventory score can be judged. In our study, for example, there was concurrence on the

a numerical score, it facilitates comparison with other quantitative data. Finally, since the inventory reflects changes in the Depth of Depression over time, it provides an objective measure for judging improvement

Vol. 4, June, 1961

The authors wish to express their appreciation to their consultants, Seymour Feshbach, Ph.D. and Marvin Hurvich, Ph.D.

Department of Psychiatry, Research Laboratories, Hospital of the University of Pennsylvania, 3400 Spruce St., Philadelphia 4.

Beck et al.

A (Mood)
0 I do not feel sad
1 I feel blue or sad
2a I am blue or sad all the time and I can't snap out of it

ARCHIVES OF GENERAL PSYCHIATRY

2b I am so sad or unhappy that it is very painful
3 I am so sad or unhappy that I can't stand it
B (Pessimism)
0 I am not particularly pessimistic or discouraged about the future
1a I feel discouraged about the future
2a I feel I have nothing to look forward to
2b I feel that I won't ever get over my troubles
3 I feel that the future is hopeless and that things cannot improve
C (Sense of Failure)
0 I do not feel like a failure
1 I feel I have failed more than the average person
2a I feel I have accomplished very little that is worthwhile or that means anything
2b As I look back on my life all I can see is a lot of failures
3 I feel I am a complete failure as a person (parent, husband, wife)
D (Lack of Satisfaction)
0 I am not particularly dissatisfied
1a I feel bored most of the time
1b I don't enjoy things the way I used to
2 I don't get satisfaction out of anything any more
3 I am dissatisfied with everything
E (Guilty Feeling)
0 I don't feel particularly guilty
1 I feel bad or unworthy a good part of the time
2a I feel quite guilty
2a I feel bad or unworthy practically all the time now
3 I feel as though I am very bad or worthless
F (Sense of Punishment)
0 I don't feel I am being punished
1 I have a feeling that something bad may happen to me
2 I feel I am being punished or will be punished
3a I feel I deserve to be punished
3b I want to be punished

G (Self Hate)
0 I don't feel disappointed in myself
1a I am disappointed in myself
1b I don't like myself
2 I am disgusted with myself
3 I hate myself
H (Self Accusations)
0 I don't feel I am any worse than anybody else
1 I am very critical of myself for my weaknesses or mistakes
2a I blame myself for everything that goes wrong
2b I feel I have many bad faults
I (Self-punitive Wishes)
0 I don't have any thoughts of harming myself
1 I have thoughts of harming myself but I would not carry them out
2a I feel I would be better off dead
2b I have definite plans about committing suicide
2c I feel my family would be better off if I were dead
3 I would kill myself if I could
J (Crying Spells)
0 I don't cry any more than usual
1 I cry more now than I used to
2 I cry all the time now. I can't stop it
3 I used to be able to cry but now I can't cry at all even though I want to
K (Irritability)
0 I am no more irritated now than I ever am
1 I get annoyed or irritated more easily than I used to
2 I feel irritated all the time
3 I don't get irritated at all at the things that used to irritate me
L (Social Withdrawal)
0 I have not lost interest in other people
1 I am less interested in other people now than I used to be
2 I have lost most of my interest in other people and have little feeling for them
3 I have lost all my interest in other people and don't care about them at all

Vol. 4, June, 1961

DEPTH OF DEPRESSION

M (Indecisiveness)
0 I make decisions about as well as ever
1 I am less sure of myself now and try to put off making decisions
2 I can't make decisions any more without help
3 I can't make any decisions at all any more
N (Body Image)
0 I don't feel I look any worse than I used to
1 I am worried that I am looking old or unattractive
2 I feel that there are permanent changes in my appearance and they make me look unattractive
3 I feel that I am ugly or repulsive looking
O (Work Inhibition)
0 I can work about as well as before
1a It takes extra effort to get started at doing something
1b I don't work as well as I used to
2 I have to push myself very hard to do anything
3 I can't do any work at all
P (Sleep Disturbance)
0 I can sleep as well as usual
1 I wake up more tired in the morning than I used to
2 I wake up 1-2 hours earlier than usual and find it hard to get back to sleep
3 I wake up early every day and can't get more than 5 hours sleep

Q (Fatigability)
0 I don't get any more tired than usual
1 I get tired more easily than I used to
2 I get tired from doing anything
3 I get too tired to do anything
R (Loss of Appetite)
0 My appetite is no worse than usual
1 My appetite is not as good as it used to be
2 My appetite is much worse now
3 I have no appetite at all any more
S (Weight Loss)
0 I haven't lost much weight, if any, lately
1 I have lost more than 5 pounds
2 I have lost more than 10 pounds
3 I have lost more than 15 pounds
T (Somatic Preoccupation)
0 I am no more concerned about my health than usual
1 I am concerned about aches and pains or upset stomach or constipation or other unpleasant feelings in my body
2 I am so concerned with how I feel or what I feel that it's hard to think of much else
3 I am completely absorbed in what I feel
U (Loss of Libido)
0 I have not noticed any recent change in my interest in sex
1 I am less interested in sex than I used to be
2 I am much less interested in sex now
3 I have lost interest in sex completely

Beck et al.