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Measuring Up: Social Comparisons on Facebook and Contributions to Self-Esteem and Mental Health

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Abstract

These two exploratory studies examined how making social comparisons on social networking sites can impact an individual's self-esteem and mental health outcomes. To examine the link between social comparison, Facebook use, self-esteem and mental health, a survey research study was conducted among 417 college undergraduates. The study found that the amount of time users spent on Facebook, Facebook investment, and both active and passive use were correlated with greater amounts of social comparison. In turn, high levels of social comparison predicted lower self-esteem and poor mental health. Using an experimental paradigm, the second study assessed 127 participants before and after a Facebook profile evaluation task and found some ties between Facebook use, social comparison, self-esteem and mental health, which partially confirmed the results of the first study.

Measuring Up: Social Comparisons on Facebook and Contributions to Self-Esteem and

Mental Health

Since Myspace pioneered its way into cyberspace in 2003, social media have revolutionized the way people interact. Facebook, with more than one billion members, is the world's largest social network and has become an important part of many people's daily routines. Facebook is now ten years old and is still considered the dominant social networking platform, although other social networking sites are becoming formidable competitors. Fifty seven percent of American adults have Facebook accounts, and 73% of adolescents (ages 12-17) have Facebook accounts (Smith, 2014). The majority of users who have active accounts are millennials (15-34 year olds). Social media have not only transformed the way people communicate, but they have also changed the kind and amount of information that is accessible.

However, not all of this information is necessarily desired: Facebook users are often exposed to details about their peers' lives that were not actively sought out. This exposure to other people's social activities can lead to users' comparing their own social lives with that of their peers, and subsequently, may have harmful effects. For example, a college student might scroll through her Instagram feed and see pictures her friends have posted of the delicious foods they ate, fun trips they went on, and new shoes they bought – without her. These pictures may lead her to socially compare herself to others and ask questions such as: "Is my life as exciting as my friends' lives? Am I happy with the way my life is? Why didn't they invite me?" Although researchers have expressed concern about the potential effects of these types of questions on an individual's self-esteem and mental health, little empirical evidence has tested this issue directly. Accordingly, in this study, I address several issues relating to social media use: motivation for use, positive and negative effects, social comparison, self-esteem, and mental health outcomes.

Facebook use and effects

In order to understand how social media use affects us, we must first understand the motivations for using it. Nadkarni and Hofmann (2012) reviewed the literature and propose that people are motivated to use Facebook for two primary reasons: 1) a need to belong and 2) a need for self-presentation. In their analysis, Toma and Hancock (2013) found that Facebook profiles help satisfy individuals' need for self-worth and self-integrity. Participants gravitated towards their Facebook profiles after receiving a blow to their egos. This evidence seems to support Nadkarni and Hofmann's model. Other research also seems to support this premise. Generally, people seem to be using Facebook to maintain existing social connections and acquire information about others. Individuals may also use Facebook to organize and plan events for groups (Ross et al., 2009; Spiliotopoulos & Oakley, 2013; Yang & Brown, 2013). Research also suggests that Facebook use has become so integrated in people's lives that it is somewhat a continuation of offline activities (Yang & Brown, 2013).

Unsurprisingly, the use of Facebook comes with many consequences, as does any form of media use, and has been linked with a number of negative effects. For instance, Kittinger and colleagues (2013) found that overuse and strong attachment to Facebook may be related to Internet addiction. Individuals who used Facebook excessively and had a strong attachment to Facebook were more likely to report that using Facebook had caused them to be late or had caused them to be in trouble, and that it would be difficult for them to stop using Facebook (Kittinger et al., 2013). Another study assessed participants' frequency of Facebook use and subjective well-being over time and found that Facebook use predicted a decline in subjective well-being (Kross et al., 2013). Finally, Smith et al., (2013) discovered that maladaptive Facebook use was related to increases in body dissatisfaction and bulimic symptoms in

participants. However, this is not to give the impression that using Facebook can only be detrimental. Studies have found that Facebook may be beneficial for individuals with low self-esteem by helping these individuals bridge social capital, gain acceptance and adapt to a new culture (especially within a university setting), and in some cases, even enhance subjective well-being (Ellison et al., 2007; Kim & Lee, 2011; Yu et al., 2010). Individuals who use Facebook may experience a sense of belonging and social support from others (Kim & Lee, 2011; Liu & Yu, 2013).

Comparing ourselves to others

One domain in which Facebook use may have negative or positive consequences is in the realm of social comparison. Most people compare themselves to others every day, whether they mean to do so or not. In fact, it seems that social comparison is a natural and expected part of the human experience. Leon Festinger proposed that individuals are naturally driven to evaluate their own opinions and abilities, and that these evaluations affect how we behave (Festinger, 1954). Festinger also postulated that individuals have an innate, perpetual desire to improve their own abilities and may become motivated to do so through comparisons with more superior individuals, which he termed upward comparisons (Festinger, 1954). In addition, individuals can be motivated by downward comparisons, where comparisons are made with less competent individuals (Wills, 1981). However, true downward comparison is not always plausible, depending on the situation at hand. For example, if a student receives the lowest grade on a test, there is no one worse off with which to compare. Pomery (2012) suggests that downward comparisons are motivated by one's desire to improve self-esteem, and that downward shifts are motivated by a desire to protect self-esteem that is threatened. Downward shifts occur when

individuals lower the comparison target level, which might mean comparing with someone who is doing reasonably well in class instead of the student who has the best grades.

Yet, these comparisons are not free of other influences. It has been found that similarity has bearing on whether or not an individual may compare him or herself with another person. People prefer to compare with others that they perceive to be similar to themselves (Pomery, 2012). The more that an individual identifies with his/her upward comparison target, the greater the negative effect of the comparison; vice versa, the more that an individual identifies with his/her downward comparison target, the greater the positive effect of the comparison (Pomery, 2012). In addition, individuals may also make contrasting comparisons with those they do *not* identify with, such as "I can never be as good as she is" (upward) or "That will never happen to me" (downward). The literature suggests that the effects of social comparisons are dependent on whether an individual perceives that they are similar or dissimilar to their comparison target. Interestingly, it seems that a target's perceived future similarity also affects the comparison being made. If an individual believes that he or she may become like the comparison target eventually, this might change the type of comparison being made. For example, an individual with a chronic illness may not want to engage in downward comparison with an individual who has the same illness (but is worse off) because there is a chance that his or her condition may worsen and match that state (Pomery, 2012).

This is not to suggest that individual differences do not impact the amount or effects of social comparisons. Gibbons and Buunk (1999) constructed a scale to gauge whether people varied in the amounts of comparisons they typically made and found that some people are more likely to compare than others. It was found that women are more likely to compare than men, and that there were differences in how tendencies to compare affected cognitions and emotions.

Gibbons and Buunk (1999) found that people who are more self-conscious and who are highly self-reflective tend to make more social comparisons. Higher comparers may have more empathy for others because they are better at visualizing situations from another person's perspective. Furthermore, high comparers are more likely to experience more mood swings, have lower self-esteem, and be more depressed than low comparers.

How social comparison relates to self-esteem

One individual difference factor that is often raised as a potential predictor of level of social comparison is self-esteem. However, the relation between self-esteem and social comparison appears to be rather complex. Is self-esteem a predictor or an outcome? Prior research seems to give evidence for both. Wheeler and Miyake (1992) had 94 college students record the social comparisons they made for two weeks. They found that whether one makes upward or downward comparisons is dependent upon the target, but that having a negative mood before socially comparing oneself is more likely to lead to upward comparisons. One might expect that having a negative mood before making comparisons would lead to downward comparisons. The results seem counterintuitive in that they also found that subjective well-being is decreased by upward comparisons and increased by downward comparison. The findings from a two-part study by Aspinwall and Taylor (1993) support the possibility that mood may be a mediator between self-esteem and the effects of social comparison. Their first study found that only the participants with low self-esteem and induced negative mood reported that their mood was improved after being exposed to downward comparison information. Their second study found that low self-esteem participants who had experienced a recent academic setback made more favorable self-evaluations about themselves and thought they would be more successful later after being exposed to downward comparison information.

Puric et al. (2011) tested self-esteem as a predictor of the effects of social comparison by asking high school students to view pictures of either attractive or unattractive individuals of their own gender, or if they were in the control condition, no pictures. Pretest and posttest scores on a self-esteem scale and appearance scales were compared. The study found that forced social comparison did impact the students' self-esteem and appearance satisfaction for both genders that were exposed to pictures of unattractive individuals. It was also found that higher pretest self-esteem and lower appearance satisfaction predicted higher posttest self-esteem regardless of the experimental condition. However, the students who were exposed to unattractive pictures and had low pretest self-esteem reported higher self-esteem after viewing the pictures.

Finally, Wood et al. (1994) argued that individuals with low self-esteem make social comparisons as a form of self-enhancement, but only when such comparisons carry a low risk of humiliation. Wood et al. conducted a trio of experiments to test this hypothesis. The findings from the experiments showed that: 1) Individuals with initially low self-esteem sought the most social comparisons after receiving feedback about their success; 2) Individuals with initially high self-esteem sought the most comparisons after feedback about their failure; and 3) Individuals with initially low self-esteem who succeeded sought the most comparisons, but only when the comparisons were favorable. These studies suggest that self-esteem and social comparison may be mediated by factors such as mood and perception of risk when making social comparisons.

These findings are supported by media research, which shows that the combination of comparisons and media produce an even stronger effect. Much of the research about the effects of media on social comparison concerns body image and/or the "thin ideal." For example, Bessenhoff (2006) explored the topic using advertisements. Female undergraduates were exposed to either advertisements with thin women or without thin women. Data indicate that

exposure to thin ideal advertisements increased negative mood, depression, and body

dissatisfaction while lowering self-esteem. Furthermore, participants with high levels of body

image self-discrepancy were more likely to engage in social comparison and more likely to be

affected negatively (Bessenhoff, 2006). Perhaps this outcome suggests that women with higher

body image self-discrepancy believe that their ideal body image is unattainable, and thus are

more affected by social comparisons. This is not to suggest that men are not affected by media

consumption. In fact, studies have shown that men also experience greater dissatisfaction with

their bodies after being exposed to different forms of media (Agliata & Dunn, 2004; Mulgrew,

2013). Together, these findings indicate that for both women and men, regular consumption of

mainstream media, and their idealized images of appearance and beauty, are linked to higher

levels of social comparison and body dissatisfaction.

The impact of social networking sites

Media consumption for the typical American adult consists not only of passive

consumption (such as watching television), but also includes the use of social networking sites

(SNS). Social networking sites require individuals to build an online profile, where they may

choose to present themselves to others in a certain way. Data indicate that the majority of

college students use social networking sites, particularly Facebook. College students spend an

average of at least thirty minutes on Facebook per day (Kalpidou et al., 2012). Moreover, use of

the Internet, and of SNS, specifically, has been linked in a handful of studies to increased social

comparison and diminished self-esteem and self-image. For example, Tiggemann and Slater

(2013) found that greater Internet consumption was related to internalization of the thin ideal,

body surveillance, and drive for thinness among teenage girls. I would hypothesize that this

relation is at least partially driven by social comparisons, particularly upward comparisons.

Haferkamp and Karmer (2011) investigated the effects of online profiles on social networking sites in two studies. The first study found that participants had a more negative body image after being shown profile pictures of physically attractive individuals than those who had been shown profile pictures of less physically attractive individuals. The second study found that male participants who were shown profiles of more successful men reported a higher perceived divergence between their current career status and their ideal career status when compared with male participants who were shown profiles of less successful individuals. Haferkamp et al. (2012) further explored self-presentation on social networking sites in the context of gender. Their study found that women were more likely to use social networking sites for comparing themselves with others and acquiring information, and that men primarily used social networking sites to look at other people's profiles to find friends.

There have also been studies that examined the impact of Facebook use, in particular. Chou and Edge (2012) collected survey data from undergraduates with questions about their Facebook use. Their findings indicated that individuals who had been using Facebook for a longer period of time perceived that others were happier and that life was not fair. Participants who spent more time on Facebook weekly reported that they felt others were happier and had better lives. Continuing with the trend of negative effects, Feinstein et al. (2013) examined negative social comparison on Facebook and what might be the mechanism that leads to depressive symptoms. Their results indicate that negatively comparing oneself to others can lead to rumination, which in turn can increase the risk of depressive symptomatology. In addition, Kalpidou et al. (2011) examined the relation between Facebook and well-being in college students. They found that older undergraduates were more likely than younger undergraduates to benefit from Facebook use, as they learn to use Facebook more effectively to make connections

with their peers. Their study also found that the number of Facebook friends an individual has

and not the amount of time they spend using Facebook predicts college adjustment.

The Current Study

The literature shows that making social comparisons in the context of social networking

sites (in particular, Facebook) can impact an individual's self-esteem and mental health in both

positive and negative ways. However, it is unclear whether self-esteem is a predictor or an

outcome and what other influences may play a role. In the current study, I sought to investigate

the relation between Facebook use, social comparison, and mental health outcomes. I outline

three primary research goals here with corresponding hypotheses.

Research aim 1: Types of social comparisons

The research on general social comparisons is thorough, but due to the (relative) novelty

of social networking sites, there is a lack of literature on how individuals socially compare when

using Facebook. This study sought to explore the types of social comparisons that are being

made when individuals use Facebook. I anticipated that Facebook users would make both

upward and downward comparisons, and I hypothesized that:

H1: Individuals who spent more time using Facebook would make more social

comparisons (both upward and downward) than individuals who did not spend as much time

using Facebook.

To assess the types of comparisons, I created a measure that asks participants to report

the ways in which they compare themselves to others. The measure is adapted from the Iowa-

Netherlands Comparison Orientation Measure (Gibbons and Buunk, 1999). Items have been

modified and added in order to frame social comparisons in a social networking context. The

measure encompasses comparisons about appearance and social life, as well as downward

comparisons and the general tendency to compare oneself to others. I believe that using this

modified scale to examine social comparisons on Facebook is an important expansion to the

literature. Understanding what types of comparisons are being made will give us a more

nuanced view of how users experience Facebook and may help us predict the types of effects an

individual's use will have.

I also expected that the way in which individuals used Facebook and the extent to which

they felt it was important to their social life would be related to the amount of social comparisons

that were made. I hypothesized that:

H2: Individuals who perceived that Facebook is important to their social lives and used

Facebook more actively would make more social comparisons than individuals who did not

perceive that Facebook is important to their social lives and used Facebook less actively.

Research aim 2: Investigating social comparison as a mediator

The literature on Facebook illustrates that Facebook use is related to self-esteem and

mental health in both negative and positive ways. However, we do not have a clear picture of

what is driving these effects. This study addressed the gap in the literature by examining one

possible pathway by which these variables may be related. More specifically, I postulated that

the relation between Facebook use and self-esteem and mental health outcomes is mediated by

the degree to which individuals socially compare with others. I expected that Facebook use

would be associated with social comparison, as noted in H1 and H2, and that social comparison

would predict self-esteem and mental health. I expected that:

H3: Individuals who made more social comparisons would have lower self-esteem and

more negative mental health outcomes.

H4: There would be some direct connections between Facebook use and self-esteem and mental health, but many of these connections would be reduced once social comparison was controlled.

Study 1: Method

Participants

The sample consisted of 417 undergraduate students at a large Midwestern university, who were enrolled in an introductory psychology course. Participants received course credit for their participation in the study. The participants ranged in age from 18 to 24 (*M*= 18.96), with the majority being 18 or 19 years of age (76.3%). The sample was 54.2% female (N=226), and participants identified their ethnicity as White/Caucasian (69.5%), Asian (17.7%), Latino/Hispanic/Native American (4.6%), Black/African American (3.4%), Multi-racial (1.0%), and Middle-Eastern (3.4%). Two participants did not indicate their race. Participants were also asked to indicate their sexual orientation, religiosity, and whether they were raised in the U.S.

Procedure

Participants were recruited from the undergraduate psychology subject pool. Only students over 18 years of age were eligible to participate. Participants read and signed a written consent form before participating in the study and were given an oral introduction to the study by the experimenter. Paper-and-pencil surveys were distributed to participants in groups of approximately ten people. The experimenter remained present during the study to answer any questions that participants might have. The completed surveys were collected separately from the consent forms to preserve anonymity. The surveys took approximately 40 to 60 minutes to complete. Data were collected from January to April of 2013.

Measures

Social Networking Sites/Facebook Use

Participants were asked to indicate how often they used the following popular social media: Facebook, Messenger (e.g. Hotmail, g-chat), Instagram, YouTube, a blogging platform, Tumblr, Twitter, Formspring, Pinterest, GooglePlus, and other. Response options ranged from *never or almost never* to *several times a day*. Additionally, participants were asked to report their age when they first began using social media and which sites they used most frequently by writing their response in the space provided. If the participant reported that they used Facebook, they were asked to answer a set of questions about their Facebook use. Participants indicated how many total friends they had on Facebook and how many minutes per day they used Facebook. The responses for number of Facebook friends ranged from "50 or less Facebook friends" scored as 1, to "more than 750 Facebook friends," scored as 8. The responses for Facebook use per day ranged from 1 to 6, with 1 being "less than 10 minutes per day" and 6 being "more than 3 hours per day."

We also assessed how much participants felt that Facebook was integrated into their daily lives, which we termed Facebook investment. Participants rated each of the 6 items on a 3-point Likert scale with the options *disagree, somewhat agree,* and *agree*. For example, participants were asked to indicate how much they agree with statements like "Logging on to Facebook is part of my everyday activity" and "I feel like my social life would suffer if I were unable to use Facebook." A mean score representing Facebook Investment was computed across these items (alpha= .99).

Participants were also asked to report what they did on an average visit to Facebook. These activities were classified as either active or passive. Participants rated each of the 13 items on a 6-point Likert scale anchored by *never* and *several times a day*. Passive Facebook use

included 6 items such as "How many distinct profiles do you look at?" and active Facebook use

items included 7 items such as "How frequently do you update your status?" Mean scores for

Active Facebook Use (alpha=.99) and Passive Facebook Use (alpha = .97) were computed across

these items.

Self-Esteem

Participants' evaluations of their worth and competence were assessed using the State

Self-Esteem Scale (Heatherton & Polivy, 1991). This 20-item scale measures global self-esteem

and consists of three subscales: Performance Self-Esteem (7 items; e.g. "I am worried about

whether I am regarded as a success or failure"), Social Self-Esteem (7 items; e.g. "I am worried

about what other people think of me"), and Appearance Self-Esteem (6 items; e.g. "I am pleased

with my appearance"). Responses to each of the 20 statements were made on a 5-point Likert

scale anchored by *not at all* and *extremely*. Thirteen of the items were worded negatively and

reverse scored, where a higher mean score indicated more positive self-esteem.

Self-Worth

The Sexual Appeal subscale from the Gordon and Ward Self-Worth Measure (2000) was

used to assess the degree to which participants base their self-worth on their sexual appeal. The

participants were given the following prompt: "How would you feel about yourself if…" and

were asked to indicate the extent to which they would feel better or worse about themselves in

each of 23 situations, 12 of which reflected their sexual attractiveness and appeal. Sample items

include, "You were wearing an outfit that you know looks good on you" and "You gained 30

pounds." Responses were indicated using a 7-point scale anchored by "Ugh, I would feel

worthless" at -3, and "Wow! I would feel really great about myself" at +3. Higher scores, based

on mean absolute values across the 12 items (alpha = .75), reflect the extent to which sexual

appeal anchors one's self-worth.

Social Comparison

Social comparison in the context of social networking sites was measured using a scale

created for this study. The items were adapted from the Iowa Netherlands Comparison

Orientation Measure (Gibbons & Buunk, 1999). Items were added and adjusted in order to

frame social comparisons in a social networking context. The scale consisted of 18 items, with

three subscales: appearance (alpha = .91), social life (alpha = .78), and general comparison

(alpha = .71). The scale also assessed upward and downward comparison. Participants were

asked to report how much they agreed with given statements on a 5-point Likert scale, ranging

from "definitely disagree" to "definitely agree". "I've felt pressure from the people I see on

social networking sites to have a perfect body" and "I only post pictures on Facebook that paint

me in a flattering light" are examples of some of the items. Five items were reverse-scored. A

mean score was calculated across all of the items, with a higher score indicating a greater amount

of social comparison.

Mental Health

Psychological symptoms were measured using the Brief Symptom Inventory (Derogatis &

Melisaratos, 1983). This measure asks participants "During the past 7 days, how much were you

distressed by" each of the following 53 items. Responses are provided using a 5-point Likert-type

scale with endpoints of "0" indicating "Not at all" and "4" indicating "Extremely." There was an

additional option for "R" meaning "Refused" if they do not wish to answer. These 53 items are

broken down into nine symptom dimensions, listed here with examples: Somatization ("Nausea or

upset stomach"), Obsession-Compulsion ("Having to check and double check what you do"),

Interpersonal Sensitivity ("Feeling very self-conscious with others"), Depression ("Feeling no

interest in things"), Anxiety ("Feeling tense or keyed up"), Hostility ("Temper outbursts that you

could not control"), Phobic Anxiety ("Feeling uneasy in crowds"), Paranoid Ideation ("Feeling others

are to blame for most of your troubles"), and Psychoticism ("The idea that something is wrong with

your mind"). Dimension scores are an average of the item responses. Items 11 ("Poor appetite"), 25

("Trouble falling asleep"), 39 ("Thoughts of death or dying"), and 52 ("Feelings of guilt") are not

included in the nine dimensions, but are in the measure because of their clinical relevance and do

factor into global scores of psychological distress. In this study we were interested in five of the

dimensions: depression, anxiety, hostility, paranoia, and interpersonal sensitivity.

Results

Preliminary Analyses

Descriptive statistics for the central independent and dependent variables are provided in

Table 1. Participants used Facebook an average of roughly 30 to 60 minutes per day, and the

average age of first SNS use was approximately 13 years old. Participants tended to use

Facebook more actively than passively, and tended to make more comparisons about social life

than about appearance or general/downward comparisons. Of the mental health items we

assessed, the mean was highest for sensitivity, followed by depression, anxiety, paranoia, and

hostility.

A factor analysis was run on the modified social comparison measure in order to better

group the scale items into categories. The analysis revealed three factors (Table 2). Nine items

loaded onto Factor 1. The themes from these items suggest that they are related to social

comparisons about appearance. We found that 3 items loaded onto Factor 2, which represents

downward and general social comparisons. Finally, 5 items loaded onto Factor 3, which we

deemed as comparisons about social life. Mean scores were taken across the items in each of

these factors to produce the following three variables: comparison - appearance (9 items; alpha =

0.91); downward general comparison (3 items; alpha = 0.71); and comparison – social life (5 items; alpha = 0.78).

Testing the Main Research Questions

The first hypothesis (H1) predicted that individuals who spent more time using Facebook would make more social comparisons than individuals who did not spend as much time using Facebook. A zero-order correlation analysis was conducted to assess the link between social comparison and amount of time spent on Facebook (minutes per day). Findings are provided in Table 3. The results showed that the number of minutes spent using social networking sites per day was significantly correlated with comparisons about appearance. This indicates that the more time an individual spends on social networking sites per day, the more likely they are to make comparisons about appearances, which supports our hypothesis.

The second hypothesis (H2) concerned the relation between Facebook investment, Facebook use, and social comparison. We computed a series of zero-order correlations between social comparison and the four Facebook use variables. Results are presented in Table 3. As expected, investment in Facebook was related to all three types of comparisons. This indicates that individuals who feel that Facebook is more integral to their social lives make more social comparisons than individuals who do not feel that Facebook is very important to their social lives. We also found that both passive use and active use of Facebook were correlated with making more comparisons. Interestingly, the data showed that number of years using Facebook was not significantly correlated with social comparisons. Together, these findings indicate that, regardless of type of use, using Facebook may prompt individuals to make social comparisons, which supports our hypothesis.

Our third hypothesis (H3) predicted that social comparison would mediate the

relationship between Facebook use and self-esteem and mental health. In order to test this

hypothesis, we first calculated zero-order correlations between social comparison and mental

health and self-esteem. These correlations are shown in Table 4.   Overall, we found that higher

levels of social comparison were indeed associated with lower self-esteem and more symptoms

of depression, anxiety, hostility, paranoia, and sensitivity. Our hypotheses were supported.

To test our fourth hypothesis (H4), we performed further analyses to explore the relation

between Facebook use, mental health outcomes, and self-esteem, while controlling for social

comparison. The social comparisons we controlled for were a composite variable that reflected

comparisons about social life and appearance. We first performed zero order correlations

between the five Facebook variables and the eight self-esteem and mental health variables. These

correlations are illustrated in the top half of Table 5. In total, 12 of the 40 correlations were

significant. Results indicate that more time spent on Facebook per day was related to lower

performance, social, and appearance self-esteem. Furthermore, greater investment in Facebook

was associated with lower self-esteem (all three types), and more symptoms of depression and

anxiety. Finally, greater passive use of Facebook was linked to lower social self-esteem and

more symptoms of anxiety, hostility, and sensitivity. We then re-ran these analyses, but

controlled for level of social comparison. These results are provided in the bottom half of Table

5. Here, only 4 of the 40 correlations were significant. Results indicate that greater investment

in Facebook is linked with fewer symptoms of sensitivity. These data also show that more

passive and active use of Facebook are associated with greater appearance self-esteem. Because

fewer results were significant once social comparison was controlled, these results imply that

social comparison indeed acts as a partial mediator between level of SNS use and mental health

outcomes, providing support for our hypothesis. The data show that once we controlled for

social comparison, Facebook use was linked to *higher* self-esteem.

Discussion

Our efforts to investigate the link between Facebook use, social comparisons, and self-

esteem and mental health revealed that there are both direct and indirect relations between these

variables. Our data strongly suggest that the types and amount of social comparisons individuals

make are predicted by the amount of time individuals spend using Facebook per day, how

integral Facebook is to an individual's social life, and how actively the individual uses Facebook.

To summarize, our data show a direct link between Facebook use per day and level of social

comparison. Individuals who used Facebook more daily tended to make more social

comparisons. We also found that making social comparisons was associated with lower self-

esteem and more negative mental health outcomes. Finally, we found that Facebook use is

predictive of lower self-esteem and more negative mental health outcomes. Controlling for

social comparison, we found that the associations between Facebook use per day and self-esteem

and mental health outcomes were not as strong. This suggests that social comparison partially

mediates the relation between Facebook use and mental health outcomes and that perhaps

Facebook use may not necessarily be detrimental if fewer social comparisons are made.

It is unsurprising that spending more time using Facebook per day was linked to lower

self-esteem and negative mental health outcomes. Previous literature has found that combining

social comparison and media exposure tends to produce a strong effect, and our findings support

this (Agliata & Dunn, 2004; Bessenhoff, 2006; Mulgrew, 2013). The link between self-esteem

and social comparison seems to involve many factors, including the context of the comparison

and how similar an individual is to the person to whom they are comparing. Though our findings

are consistent with some arguments in the literature, we hoped to further explore the relations between our variables of interest. One limitation of our study is that our data are correlational, so we are not able to infer causal direction. It may be that individuals who make more social comparisons also choose to spend more time using Facebook. Thus, we chose to test these questions in a second study whereby some participants (experimental group) viewed socially exciting Facebook profiles, and other participants (control group) viewed less socially exciting Facebook profiles. Could we encourage some participants to engage in social comparison and to perhaps feel more inadequate by viewing Facebook profiles that depicted high levels of social interaction and popularity?

For this second study, we made three sets of predictions. The first set of hypotheses concerned the link between social comparison and experimental condition. We expected that:

H1: The experimental group would make more upward comparisons about appearance and social life than the control group, but would make fewer downward comparisons than the control group.

The second set of predictions postulated that the experimental group and the control group would differ on emotional affect, as assessed via several visual analogue scales. More specifically, we predicted that:

H2: The experimental group would have lower self-esteem, more negative affect, and less positive affect than the control group after evaluating Facebook profiles.

Finally, the third set of hypotheses predicted a link between experimental condition and self-worth. We postulated that:

H3: The experimental group would be more concerned about appearance and less concerned about achievement than participants in the control group.

Study 2: Method

Participants

The sample consisted of 127 undergraduate students recruited from a large Midwestern university, who were enrolled in an introductory psychology course. Participants received course credit for their participation in the study. The participants ranged in age from 18 to 22, with the majority being 18 years of age (52.0%). The sample was 49.6% female (N=63), and participants identified their ethnicity as White/Caucasian (71.7%), Asian (12.6%), Latino/Hispanic/Native American (1.6%), Black/African American (3.9%), Multi-racial (3.1%), and Middle-Eastern (3.1%). Nine participants did not indicate their gender and thus were not included in the analysis.

Measures

Visual Analogue Scale

A 14-item visual analogue scale (VAS) was created specifically for this study. The scale asked participants to place an "X" mark on the line between 0 and 100 to indicate their response. Sample items for this scale include: "How interesting do you think your social life is right now?", "How do you feel about your body right now?" ("Not attractive at all" to "extremely attractive", and "How do you feel right now?" ("Not angry at all" to "extremely angry"). This scale was administered to the participants before *and* after they were presented with the experimental stimuli. The questions in this scale were randomized in the pretest and posttest to prevent participants from choosing the same responses. A factor analysis was run in order to better group the scale items into categories. The analysis revealed three factors. Mean scores were taken across the items in each of these factors to produce the following three variables: self-

esteem (5 items; alpha = 0.90); negative affect (5 items; alpha = 0.72); and positive affect (4 items; alpha = 0.79).

To compute the differences between pretest and posttest scores, posttest scores were subtracted from pretest scores. In total, there were 6 variables created for statistical analysis: VAS Post Self-Esteem, VAS Post Negative Affect, VAS Post Positive Affect, Self-Esteem Difference, Negative Affect Difference, and Positive Affect Difference.

Social Networking Site and Facebook Use

Participants were given the same measures of Facebook use that were used in Study One. These measures assessed amount of daily Facebook use (minutes), total number of years using Facebook, active Facebook use, passive Facebook use, and Facebook investment. Additionally, a measure was created to assess participants' perceptions of Facebook posts. This 3-item measure asked participants to indicate how much they agree or disagree with the following statements: 1) I think people post things on Facebook to create a certain image, 2) I only post pictures on Facebook that paint me in a flattering light, and 3) Facebook pictures and posts are an idealized version of who we really are. Response options were the following, scored from 0-3: *disagree*, *somewhat agree*, and *agree*.

Facebook Profile Evaluation

A total of four sample Facebook profiles were created, two male (which we named "Tyler Smith") and two female (which we named "Lauren Williams"). In the experimental condition, the material included in the profiles was meant to portray a student at the university who had a very active social life. These profiles contained pictures and Facebook "status updates" about going to parties, alcohol consumption, and or spending time with friends. The control profiles portrayed a less socially active student at the university. These profiles

contained pictures and posts about studying, favorite TV shows, and daily activities (that did not include implied sexual activity, alcohol consumption and/or parties).

The participants were randomly assigned to either the experimental condition or the control condition. Each participant received both the female and male profiles for their condition and were asked to evaluate the profiles on a 9-point scale, ranging from "Not at all" scored as 1, to "Very much" scored as 9. Each evaluation consisted of 4 questions: 1) "To what extent does this profile accurately represent a student at [your university]?", 2) "To what extent does this person seem like people in your social circle?", 3) "To what extent would you want to be friends with this person?", and 4) "To what extent do you think this person is happy with his/her life?"

Self-Worth

The same self-worth measures from Study One were used in Study Two. The full self-worth scale contains 23-items; the following two subscales were selected for analysis here: social/sexual appeal and academic/"good student." The measure asks participants to imagine if a given event happened to them and to indicate how this would make them feel. Responses ranged from "Ugh! I would feel really horrible about myself" scored as -3 to "Wow! I would feel really great about myself" scored as 3. Responses were scored as absolute values for our analyses. There are 10 items on the appearance/sociosexual appeal subscale (alpha = 0.776, e.g. "You were asked to be a model for a calendar featuring college students") and 13 items on the professional/academic subscale (alpha = 0.597, e.g. "You were accepted to the top graduate school in the country").

Social Comparison

Similarly, the scale for social comparison that was created for Study One was used again here. However, in this study, an abridged version of the scale was used. The original scale

consisted of 18 items, with three subscales: appearance, social skills, and general comparison.

Only 12 of these items were used in Study Two (alpha = 0.82). These remaining items

represented comparisons about appearance and social skills. Participants' responses ranged from

"Definitely disagree" scored as 1 to "Definitely agree" scored as 5.

Procedure

Participants were recruited from the undergraduate psychology subject pool. Participants

were required to be 18 years of age or older to participate in the study. Participants were given

an oral introduction to the study by the experimenter and also read and signed a written consent

form before participating in the study. Participants were given the survey packet and a separate

folder containing the Facebook stimuli, which they were instructed not to open until the survey

required them to evaluate the Facebook profiles. The participants were seated so that every other

packet contained the experimental stimuli. Participants were informed that the study was

anonymous and that they may skip any questions they did not wish to answer or withdraw from

the study at any time without penalty. The experimenter remained present during the study to

answer any questions that participants might have. The completed surveys were collected

separately from the consent forms to preserve anonymity. The study took approximately 30

minutes to complete. Data were collected throughout the fall semester of 2013 (September

through December).

<div align="center">

Results

</div>

Preliminary Analyses

Descriptive statistics for the independent and dependent variables are shown in Tables 6

and Table 7. Overall, participants indicated that Facebook ($M = 4.34$) and Twitter ($M = 3.33$)

were the social networking sites they used most frequently, and the mean age for first use of

social networking sites was 13.17 years. Participants reported that they had, on average, at least

500 contacts on Facebook. Higher means indicate higher self-esteem, negative affect, and

positive affect. Higher means also indicate greater involvement in Facebook, more frequent use

of Facebook, and more social comparisons.

We did not find any significant differences between the experimental and control groups

after performing t-tests for age, religiosity/spirituality, parental education (mother and father,

respectively), and aspirations for one's own education. These results are shown in Table 8. We

also performed chi-square tests to assess potential gender and race/ethnicity differences between

the two conditions. We did not find any significant differences between the two conditions for

gender, X^2 (2, N =127) = .98, p = .612, or for race/ethnicity, X^2 (6, 127) = 6.46, p = .37.

Testing the Main Research Questions

The first set of hypotheses predicted relations between social comparison and

experimental condition. I had predicted that the experimental group would make more social

comparisons about appearance and about social life than the control group, and fewer downward

comparisons than the control group. To test these questions, I conducted an independent samples

T-test between the experimental group and the control group. Results are provided in Table 9.

The results did not show any significant differences between the groups for social comparison.

To further explore specific domains in which social comparisons might occur, I conducted T-

tests examining differences between the experimental and control groups for the individual items

of the social comparison scale. Results indicate that there were differences on individual scale

items. Specifically, the experimental group was significantly higher than the control group on

item 3, t(64.39) = -1.53, p = 0.014; item 9, t(64.37) = -1.82, p = 0.002; and item 12, t(121.29) =

0.67, p = 0.039. Item 3 ("wanting to look like others") and item 9 ("feel pressured to change

appearance") were part of the appearance subscale, and item 12 ("don't care if social/romantic

life is less exciting; reverse-scored), was part of the social life subscale. The data did not reveal

any significant differences between groups on downward comparison items. Overall, these

findings indicate that participants in the experimental group made more social comparisons than

the control group concerning specific appearance and achievement concerns, but that the groups

generally did not differ on downward comparisons. Thus, the hypotheses were only partially

supported.

The second set of hypotheses predicted how the experimental and control groups might

differ on affect and self-esteem. I predicted that the experimental group would feel worse about

themselves than the control group. Furthermore, I hypothesized that the experimental group

would score higher on negative affect and lower on positive affect than the control group for

each of the 6 visual analogue variables.   In order to address these hypotheses, I conducted an

independent samples T-test between the experimental and control conditions for the 6 VAS

variables. The results are provided in Table 9. There were not any significant differences

between the groups for the visual analogue scale items. Thus, these hypotheses were not

supported.

Finally, the third set of hypotheses addressed the relation between experimental condition

and self-worth. The self-worth items were divided into two subscales, appearance and

achievement. I predicted that participants in the experimental group would be more concerned

about appearance and less concerned about achievement than participants in the control

condition. To investigate this relation, I performed an independent samples t-test. These data

showed that the experimental group was lower on the achievement subscale than the control

group, $t(125) = -0.77$, $p = 0.031$. This finding indicates that participants in the experimental

group based less of their self-worth on achievement than participants in the control group. Thus, the hypotheses were partially confirmed.

Post-hoc analyses. Because general level of Facebook use may also relate to self-image and self-comparisons, as indicated in Study One, correlational analyses were run between the five Facebook variables (FB use per day, FB use years, FB Investment, FB Passive Use, and FB Active Use) and the self-worth variables (Appearance Self-Worth and Achievement Self-Worth). Analyses showed that out of the Facebook use items, only participants' scores for Facebook perception were significantly correlated to any of the outcome variables. More specifically, attributing more importance to Facebook was associated with higher levels of appearance-contingent self-worth. These findings are presented in Table 10.

Study 2 Discussion and General Discussion

The aim of this second study was to further investigate connections between social networking use, social comparisons, self-esteem, and mental health outcomes. As the first study was mainly exploratory, I hoped to discover causal relations with this follow-up study. Some of the results from this study confirmed the results from Study One. Similar to the first study, it was found that Facebook is the most frequently used social networking site, and that participants tended to begin using social networking sites in early adolescence. The findings also suggest that individuals who are exposed to certain types of material on social networking sites make more comparisons about their appearance and achievement than individuals who are not exposed to this material.

Some of the expected experimental effects emerged and some did not. I expected that participants in the experimental group would differ from participants in the control group for social comparison. However, the data did not show significant group differences for social

comparisons in general. There were some significant differences between the groups in terms of

specific types of comparisons, as measured more three individual items. Here, the participants in

the experimental group made significantly more social comparisons about their appearance and

social life than participants in the control group. I also predicted that participants in the

experimental and control groups would differ on affect and self-esteem. However, the data did

not show any significant differences in affect and self-esteem in the two groups. Finally, the data

demonstrate that participants in the experimental group based less of their self-worth on

achievement than participants in the control group. However, there were no significant

differences between these groups in terms of appearance-based self-worth.

Limitations

Despite some of the hypotheses being supported, this study has some limitations. First,

some of the measures used in the study are not established and validated measures. The

Facebook use, Facebook involvement, and Facebook activity scales were created especially for

this study, as there are not yet standardized measures for these constructs. Second, the

experiment was conducted using paper printouts of Facebook profiles, so for future studies, I

would have the survey questions and stimuli online to match the environment where individuals

use social networking sites. I also wonder whether there is a desensitization effect for social

comparisons on social networking sites. It may be that participants are so accustomed to making

these types of social comparisons in their daily lives that the stimuli used in the experiment did

not exceed their comparison threshold. It may be necessary for longer exposure or exposure to

more extreme stimuli in order to elicit social comparisons that have a stronger effect. Lastly, a

self-report survey has some general limitations. As the participants are answering the questions

according to their own interpretations, they may be subject to some biases. Participants may be

susceptible to social desirability bias, especially as psychology majors who have interest in assisting others with their research. Participants may also not be entirely honest or accurate in their responding. For example, participants were asked to report how many minutes per day they spent on Facebook and how many contacts they had in their network. Some participants may have over or under exaggerated these estimates.

Implications and Future Directions

As mentioned previously, prolonged Facebook use can have negative effects on users, particularly college students, who are the heaviest users of social networking sites. The results of our studies show that college students who spend more time using Facebook daily are more likely to make social comparisons than their peers who do not use Facebook as often. The ways in which individuals are using Facebook, either actively or passively, can also prompt social comparisons. These social comparisons can drive individuals to feel worse about themselves in the contexts of achievement and appearance. Thus, it is unsurprising that these comparisons can negatively impact Facebook users' self-esteem and might lead to more negative mental health outcomes.

In the second study, we found some experimental effects and some null effects. However, the null results were not counter to our hypotheses. Considering that the exposure to Facebook stimuli was relatively short in comparison to the average amount of time college students spend using Facebook per day, these results are particularly interesting. These findings indicate that Facebook use can have some effects on users, even after only a short period of use. These findings also imply that other effects may not become evident unless users are exposed to Facebook for longer periods of time or perhaps more extreme stimuli. Furthermore, it is interesting that once we controlled for social comparison, there were fewer negative effects,

implying that not comparing oneself to others when using Facebook could be less detrimental to one's mental health.

What do these findings mean for Facebook users and researchers? Whereas it would be unrealistic to expect that individuals would discontinue using Facebook in order to decrease the number of social comparisons they are making, I believe that simply being aware of one's own social comparisons may reduce the negative effects of social comparisons. In addition, being aware that individuals often portray themselves in a flattering light on social media profiles may also have an effect. For future studies, I would recommend a longer period of exposure to Facebook stimuli to emulate individuals' actual Facebook experiences. The Facebook profiles were paper printouts, and I believe this may have somewhat influenced respondents' responses. I believe that further research about Facebook and social comparison should more closely resemble a "real" Facebook experience by giving respondents an electronic version of the Facebook profiles and also a greater number of profiles to evaluate. Finally, I advise that future studies also incorporate profiles of individuals that participants are friends with, as the comparison group could affect what kinds of comparisons are being made and. In sum, research involving Facebook and social comparison is still relatively young and we do not yet have a clear picture of the link between the two. In the future, it may be useful to expand the measure for Facebook perception and to consider other factors that may be at play.

Table 1

Study 1: Descriptives of Facebook Use, Social Comparison Variables, and Mental Health Variables

Facebook Variables	Sample Mean	Std. Dev	Range
Minutes Per Day	3.10	1.23	1-6.0
Years Using Facebook	5.59	1.79	1-12.0
Facebook Investment	1.35	0.50	0-2.0
Passive Facebook Use	1.88	0.83	0-5.0
Active Facebook Use	2.00	0.80	0-3.86
Social Comparison Variables			
Comparison - appearance	2.72	0.88	1-5.0
Downward General	2.84	0.84	1-5.0
Comparison - social	3.00	0.84	1-5.0
Mental Health Outcomes			
Depression	.88	.80	0-5.0
Anxiety	.72	.73	0-5.0
Hostility	.62	.60	0-5.0
Paranoia	.66	.67	0-5.0
Sensitivity	.93	.88	0-5.0

Table 2.

Study 1: Factor Analysis of Social Comparison Items

	Loadings		
	Comparison - appearance	Downward/ general	Comparison - social
Felt pressure from SNS about weight	.855		
Felt pressure from SNS to have perfect body	.819		
Don't feel pressure from SNS to look attractive	.743		
Don't try to look like people on SNS	.733		
Wish to look like SNS	.632		
Felt pressure from SNS to change appearance	.63		
Compare appearance to SNS	.547		
Don't care if appearance is like SNS	.524		
Don't compare with others	.484		
Downward comparisons - social		.75	
Make downward comparisons		.66	
Downward comparison makes me feel better		.58	
Compare social and romantic life to SNS			.68
Feel pressure from SNS to have exciting life			.64
Don't care if social/romantic life is as interesting as SNS			.58
Make upward comparisons			.48
Upward comparisons – social			.47
Upward comparison makes me feel worse			

Table 3

Study 1: Zero-Order Correlations between Facebook Use and Social Comparison Measures

	Comp - appearance	Downward/general	Comp - social
FB use (mins)	.26**	.57	.10
FB years	-0.05	.02	-0.01
FBInvestment	.30**	.20**	.27**
FBPassive	.33**	.17*	.27**
FBActive	.20**	.12	.18*

Note. *p≤0.05, **p<0.01

Table 4

Study 1:Zero-Order Correlations between Social Comparison Measures and Outcome Variables

	Comparison - appearance	Downward General	Comparison - Social life
Performance Self-Esteem	-0.36**	-0.17**	-0.25**
Social Self-Esteem	-0.51**	-0.29**	-0.43**
Appearance Self-Esteem	-0.55**	-0.23**	-0.28**
Depression	0.33**	0.19**	0.28**
Anxiety	0.35**	0.17**	0.25**
Hostility	0.142**	0.14**	0.18**
Paranoia	0.26**	0.16**	0.22**
Sensitivity	0.46**	0.21**	0.41**

Note. *p≤0.05, **p<0.01

Table 5

Study 1: Zero-order and Partial Correlations between Facebook Use and Outcome Variables

	Zero-Order Correlations				
	FB Mins/day	FB years	FB Invest	FB Passive	FB Active
SE-Performance	-.11*	-.05	-.10*	-.09	.02
SE-Social	-.14*	.02	-.19***	-.16***	-.06
SE-Appearance	-.11*	-.06	-.12*	-.08	-.01
Depression	.07	.03	.10*	.09	.04
Anxiety	.06	.00	.11*	.12*	.07
Hostility	.06	-.03	.08	.10*	.05
Paranoid	.02	-.01	.04	.08	-.00
Sensitive	.06	.01	.08	.12*	.07
	Partial Correlations, Controlling for Social Comparison				
	FB Mins/day	FB years	FB Invest	FB Passive	FB Active
SE-Performance	-.03	-.05	.01	.02	.12*
SE-Social	.01	.06	.00	.01	.09
SE-Appearance	.03	-.03	.07	.10*	.14**
Depression	-.02	.01	-.02	-.02	-.05
Anxiety	-.03	-.01	-.00	.02	-.01
Hostility	.03	-.05	.03	.06	-.00
Paranoid	-.07	-.04	-.08	-.02	-.08
Sensitive	-.07	-.02	-.10*	-.03	-.04

Note. *p≤.05; **p≤.01; ***p≤.001.

Table 6
Study 2: Descriptives of Social Networking Site Use

SNS Variables	Sample Mean	Std. Dev	Range
Facebook	4.34	.99	0 - 5.00
Messenger	2.31	8.85	0 - 5.00
Instagram	2.68	2.17	0 - 5.00
YouTube	3.06	1.15	0 - 5.00
Blog	1.70	12.37	0 - 5.00
Tumblr	1.26	8.81	0 - 5.00
Twitter	3.33	8.84	0 - 5.00
Formspring	.79	8.78	0 - 5.00
Pinterest	.46	1.07	0 - 5.00
Google +	.42	.98	0 - 5.00
Age of first SNS use	13.17	1.61	9.00-17.00
# FB friends	7.93	11.70	1-8.00

Table 7

Study 2: Descriptives of VAS, Facebook Use, and Comparison Variables

VAS Variables	Sample Mean	Std. Dev	Range
VASPostSelf	65.69	16.81	0-100.00
VASPostNegAff	67.40	15.16	0-100.00
VASPostPosAff	37.48	15.23	0-100.00
DiffSelf	66.11	17.53	0-100.00
DiffNegAff	36.75	15.54	0-100.00
DiffPosAff	66.42	15.75	0-100.00
FB Use Variables	**Sample Mean**	**Std. Dev**	**Range**
FB Involvement	2.03	8.69	0-5.0
FB Passive Use	2.85	8.78	0-5.0
FB Active Use	2.45	8.67	0-5.0
FB Perceptions	1.31	0.55	0-2.0
Comparison Variables	**Sample Mean**	**Std. Dev**	**Range**
Appearance Self-Worth	1.66	0.58	-3.0-3.0
Achievement Self-Worth	2.36	0.43	-3.0-3.0
Social Comparison	2.98	0.70	1.0-5.0

Table 8

Study 2: Group Differences by Experimental Condition

Outcome	Group					95% CI for Mean Difference
	Experimental (N=62)		Control (N=65)			
	M	SD	M	SD	t	
age (months)	230.24	11.12	230.72	11.49	-.24	
religiosity/spirituality	2.67	1.15	2.79	1.10	-.64	
mom's education	16.24	2.36	16.94	2.36	-1.73	
dad's education	18.16	10.68	18.69	10.43	-.28	
own education	21.13	14.42	25.31	21.50	-1.28	

Table 9

Study 2: Experimental vs. Control Group Differences in Social Comparison and Affect

Outcome	Group				95% CI for Mean Difference
	Experimental (N=62)		Control (N=65)		
	M	SD	M	SD	t
Post Self-Esteem	67.21	17.83	65.05	17.30	0.69
Post Negative Affect	36.40	14.15	37.09	16.87	-0.25
Post Positive Affect	65.43	16.39	67.36	15.19	-0.69
Self-Esteem Difference	0.22	5.00	-1.02	5.33	1.34
Negative Affect Difference	0.54	8.39	0.91	8.01	-0.26
Positive Affect Difference	1.29	6.53	0.69	6.07	0.54
Social Comparison	2.93	.70	3.04	0.70	-0.77

Table 10

Study 2: Correlations between VAS Measures, Comparison Measures, and Facebook Use Items

	FB friends	FB use per day	FBInvolve	FBPassive	FBActive	FBPercept
VASPostSelf	-0.11	-0.10	-0.08	-0.07	-0.07	-0.14
VASPostNegAff	-0.01	.00	-0.03	.00	-0.04	-0.02
VASPostPosAff	-0.06	.05	.05	.06	.06	.02
DiffSelf	.11	.12	.11	.13	.13	.14
DiffNegAff	-0.07	-0.04	-0.03	-0.02	-0.04	-0.14
DiffPosAff	.03	-0.12	-0.13	-0.10	-0.12	-0.04
SocialCompareMn	.08	.15	.14	.13	.12	.15

Note. *p≤.05, **p<.01.

Acknowledgements

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