EFFECTS OF FACEBOOK INTERACTIONS ON MENTAL WELL-BEING

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ABSTRACT

Introduction

The use of social media sites has increased significantly since the creation of Facebook in 2004. In 2005, only 5% of American adults used at least one social media platform, which increased to 69% of American adults by 2018. Facebook is the most used social media outlet, and the largest age group of Facebook users is 18-29 years old (Pew Research Center, 2018). Research on Facebook use is not unanimous concerning how usage affects mental and social well-being. This study examined how self-esteem and social support affect active or passive Facebook use, time on Facebook and other social media, and time engaging in offline interactions.

Methods

Participants (n=68) were recruited from the University of Utah campus and included both students and non-students ages 18-30. Participants completed baseline questionnaires regarding their mental well-being. Then, they used an app called WeFeel to track levels of self-esteem and social support as well as time on and off of social media, completing a survey five times each day for seven consecutive days. Afterwards, participants completed the questionnaires performed at baseline again and were asked to provide feedback on their experience with the study. A series of repeated measures ANOVA were performed with high/low self-esteem or high-low perceived social support (defined using a median split) as the between-subjects variable and time on Facebook, time on all social media, and time engaging in offline social interactions during the seven-day period as the within-subjects variables.

Results

Both self-esteem and perceived social support levels measured at baseline were not significantly associated with time on Facebook, active versus passive time on Facebook, time spent on other social media, nor with time spent in offline social interactions.

Discussion

Several limitations on the study may have affected accurate collection of data. These limitations include, but are not limited to inconsistency in receiving notifications from WeFeel, miscommunication about how to fill out the WeFeel survey completely, a sample not representative of the larger population, the fact that monitoring behavior may change normal behavior, estimation biases, and the presence of other psychosocial factors that may impact well-being. Future analyses will be completed using mixed-modeling to account for variability in self-esteem and perceived social support levels and how these predict variability in social media usage and offline social interactions.

INTRODUCTION

The nature of human social exchanges has shifted as new technology and communication mediums expand. Terms such as sharing, posting, liking, and commenting have become a part of U.S. vocabulary and culture. The use of social networking websites has increased significantly since the creation of Facebook in 2004. In 2005, 5% of American adults used at least one social media platform. In comparison, in 2018, 69% of U.S. adults were found to use some type of social media (Pew Research Center, 2018). Facebook is the most widely-used social media outlet, with 2.2 billion monthly active users. If Facebook were a country, it would be the largest in the world, exceeding the population of China (Hu, 2018).

The largest age group of Facebook users is 18-29 years old, with 88% of this age group using at least one social media site. Also, Facebook use is correlated with education level. Around 79% of American college graduates use Facebook. Roughly three-quarters of all U.S. Facebook users visit the site daily (Pew Research Center, 2018).

The rise of new technology, including smart phones, has made social networking easier and more accessible, but current research is not unanimous concerning how increased Facebook use affects mental health and social well-being. However, many individuals have seemed to notice an impact of Facebook on their behavior and mental health because they have voluntarily chosen to alter the amount of time they spend on Facebook. Around 42% of adult Facebook users in the U.S. have taken a break from checking their accounts for several weeks and 26% have deleted the Facebook app from their phone this past year (Gramlich, 2019).

Social Support

The current literature on social support received through Facebook interactions yields mixed results. Social support is closely linked with good mental health while a lack of social support is strongly related to psychological distress and/or depressive symptoms (McCloskey, Iwanicki, Lauterbach, Giammittorio, & Maxwell, 2015). A study examining Facebook and social support concluded that Facebook helps people access online social support, which can enhance offline social support for college students. However, Facebook does not directly improve well-being; it merely provides more opportunities to connect with people and then receive offline support (Liu & Yu, 2013). The results of a different study concluded that the number of Facebook friends was associated with strong perceived social support, reduced stress, and greater well-being. This study hypothesized that the more Facebook friends a person has, the more connected that person feels, regardless of actual support received (Nabi, Prestin, & So, 2013). Another study on social support online concluded that Facebook-based support is not the same as traditional social support and may help supplement, but not replace traditional social support (McCloskey, Iwanicki, Lauterbach, Giammittorio, & Maxwell, 2015). A study found two explanations to their conclusions that emotional support is associated with time on social media. One explanation is that individuals who have less emotional support in their offline relationships may spend more time on social media to alleviate this. Another explanation is that individuals who first spend more time on social media then feel less emotional support (Shensa, Sidani, Lin, Bowman, & Primack, 2015).

Social support received through Facebook may depend on the intention of its use. A study compared the number of Facebook friends of freshman and upper-class students to the emotional and social adjustment they experienced. The results showed that the older students with a lot of Facebook friends experienced a positive correlation between their social connections on Facebook and emotional adjustment to college, demonstrating support through their Facebook friends. The freshman, however, experienced the opposite outcome and the

number of Facebook friends they had was detrimental to their social support on campus. This study mentioned that the way in which Facebook was used among the two groups and the factors leading to the more effective use of Facebook could be a future research opportunity (Kalpidou, Costin, & Morris, 2011).

Self-Esteem

The literature on how Facebook affects self-esteem also reveals varying results. One study stated that spending a substantial amount of time on Facebook relates to low self-esteem (Kalpidou, Costin, & Morris, 2011). Another study found that Facebook users with lower self-esteem as compared to high self-esteem users, would engage in friending online more often as a way to make up for their low self-esteem (Lee, Moore, Park E., & Park, S., 2012). One study concluded that those with lower self-esteem seemed to have a "greater sense of belongingness to the Facebook community" (Tazghini & Siedlecki, 2013, p. 830). Another study found that Facebook users often feel like they have wasted their time and engaged in something that was not meaningful. The longer people are on Facebook and continue to feel like they are wasting time, the more negative is their mood (Sagioglou & Greitemeyer, 2014). Social comparison on Facebook use may affect self-esteem because viewing others' life events may cause a Facebook user to carefully assess his or her own life. Although Facebook use alone may not affect mental health directly, it can lead to this social comparison, which often then leads to a decreased state of mental health (Jang, Park & Song, 2016).

On the contrary, several studies found positive correlations between Facebook and self-esteem. One such study stated that within a college campus, the public displaying of an individual's positive images and experiences can increase their psychological comfort (Park & Lee, 2014). Another study noted that social interactions on Facebook can be positive and boost self-esteem. This is because the online interactions allow for more time to enhance self-image, process information, and create communicative responses (Liu & Yu, 2013). Another study concluded that Facebook may help students who have low self-esteem overcome barriers and receive benefits such as "increased information and opportunities" (Ellison, Steinfield, & Lampe, 2007, p. 1163).

Online versus Offline Relationships

In a longitudinal study comparing Facebook activity and direct social interaction, offline social interactions increased well-being more than the online networks. This study also found that Facebook use is associated with lower life satisfaction while having real-life friends with whom to interact is associated with greater life satisfaction. As Park and Lee noted, "social relationships created and maintained outside Facebook…need to be simultaneously considered" in order to gauge satisfaction and support (2014, p. 617).

Passive versus Active Use of Facebook

One study stated that the quality of social media use may be more associated with mental health outcomes than the quantity of time spent on social media (Shakya & Christakis, 2017). The psychological outcomes of non-communicative use of Facebook, such as viewing profiles and browsing the news feed may differ as compared to communicative use, like messaging and commenting/liking photos (Kalpidou, Costin, & Morris, 2011). The passive and active use of Facebook and how this affects those variables was addressed in the current study. Passive usage refers to taking in information without directly exchanging, such as viewing posts, scrolling through news feeds, or reading news articles posted. Active usage involves direct exchanges with others, including posting photos or commenting/liking other posts (Verduyn et al., 2015).

The purpose of the current study was to extend previous literature on relationships between self-esteem and social support and use of social media through use of ecological momentary assessment (EMA), also known as experience sampling. Participants were prompted five times daily through the app WeFeel to answer questions regarding their Facebook use, other social media use, time offline (which included face-to-face interactions, phone calls, texting, and instant messaging), the social support received from both platforms, and their current self-esteem. For the purpose of the current study, we asked how baseline self-esteem and perceived social support affect 1) time spent on Facebook; 2) time spent on other social media sites; 3) active versus passive Facebook use; and 4) time spent in non-social media interpersonal interactions. Based on previous literature, we hypothesized that baseline self-esteem and perceived social support would have a negative relationship with time spent on Facebook, time spent on other social media sites, and more passive use of Facebook. However, our hypothesis also included that baseline self-esteem and social support would have a positive relationship with time spent interacting offline and active use of Facebook.

METHODS

Participants

The participant pool (n=68) was drawn from both students and non-students between the ages of 18 and 30 years, recruited at the University of Utah through a variety of outlets. Advertisements were made across campus, including paper and electronic listings, as well as classroom announcements. Participation was not limited to students, but most of the people who heard about the study were enrolled in classes. This study was also added to a psychology participant pool to expand recruitment options. Students enrolled in psychology classes could access this portal and find research opportunities to participate in and receive class credit. Participants were required to be between the ages of 18 and 30 years old and be an active Facebook user, which was defined as using Facebook daily for at least 30 minutes. They were also required to use an application through their smartphone called WeFeel. Out of the 68 participants, 64.7% were female. The majority of participants were Caucasian (86.8%), and not Hispanic or Latino (76.5%), and undergraduate students at the University of Utah (92.6%). The study was approved by the University of Utah Institutional Review Board and all participants provided voluntary consent prior to completing study procedures.

Procedure

Once participants indicated interest in the study, they scheduled an in-person meeting to provide informed consent, receive instructions on using WeFeel for data collection, and complete several baseline questionnaires (see measures below). This included having participants indicate through WeFeel any previously diagnosed mental health conditions and agreeing to share their information anonymously. This meeting took place somewhere on the University of Utah campus in either individual or group settings and the questionnaires were administered online through RedCap. Participants received compensation as either class credit through the Psychology Department or being entered into a raffle for a $200 Amazon gift card, which one participant received.

After the initial visit, participants completed the study remotely through WeFeel. They were sent 5-7 random reminders/day to track a number of items, including their levels of self-esteem, perceived social support online and offline, and the nature of their social media use (see measures below). They were given no notice as to when the reminders would come, but were

asked to answer questions 90 minutes within receiving the notification from WeFeel. The study required that participants fill out five of these surveys/day for seven consecutive days. In order to be compensated, participants were required to fill out 75% of all the WeFeel surveys.

After the week of filling out WeFeel surveys, participants completed the same questionnaires received at the initial meeting, thus providing data on their overall well-being before and after the study. These questionnaires were completed through a RedCap survey that was sent to participants through email. Lastly, participants were asked to answer questions in order to debrief their experience and give feedback to the PI and app developer.

Measures
Baseline/Post-Study Measures
Demographics Questionnaire (given only at baseline): A 9-item questionnaire asking respondents their name, phone number, email address, age, gender, ethnicity, race, and education status.
Rosenberg Self-Esteem Scale: (Rosenberg, 1965). Asks respondents to rate the extent to which they agree with 10 items regarding feelings toward self on a 4-point Likert scale.
Multidimensional Scale of Perceived Social Support (MSPSS): (Zimet, Dahlem, Zimet, & Farley, 1988). A 12-item scale asking respondents to rate amount of perceived social support from family, friends, or a significant other on a 7-point Likert scale.

WeFeel Survey
Participants were asked to rate their levels of self-esteem and social support from low to high, both through Facebook interactions and offline interactions. Participants also estimated the percentage they spent actively versus passively on social media. [See Figure 1]. Participants tracked (in minutes) time spent on social media sites other than Facebook, time spent on Facebook, and time engaging in interactions outside of social media. [See Figure 2].
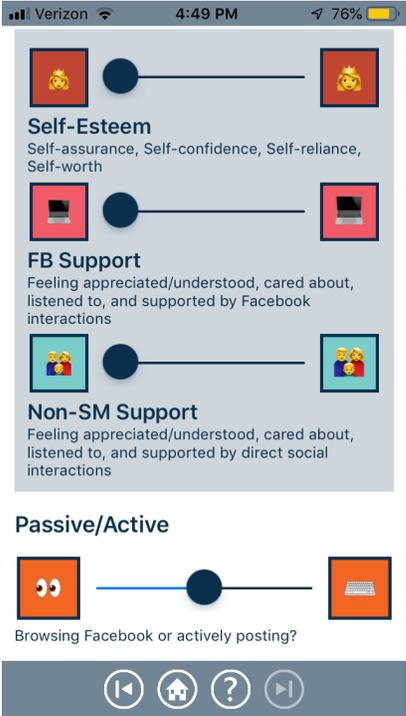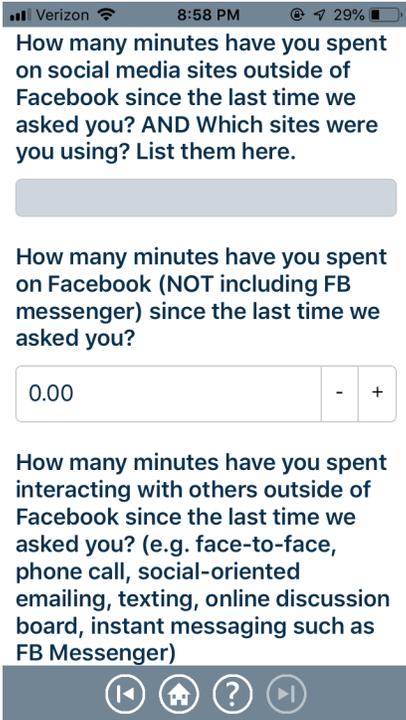

Figure 1

Figure 2

Data Cleaning and Statistical Analyses

Participants answered the questions on WeFeel considering the time since they had filled the survey out last. The amount of time between each entry was calculated for all participants. For the time between the last entry of the day and the first entry of the next day, eight hours was subtracted from that total time difference to account for sleep. Then, the total time spent on Facebook, other social media, and offline for each entry was multiplied by this time difference to produce a percentage of time on each of those activities during that time period. A series of repeated measures ANOVA were performed with high/low self-esteem or high/low perceived social support (defined using a median split) as the between-subjects variable and time on Facebook, time on all social media, and time engaging in offline social interactions as the within-subjects variables. The medians and standard deviations for high/low self-esteem and high/low social support can be found in Table 1. As a result of extant missing data, only time points 2-20 were used in analyses. Age and gender were entered as covariates for all analyses.

Table 1		
Median Split		
Measure	*Median*	*Standard Deviation*
Low Self-Esteem	16.89	4.24
High Self-Esteem	22.55	4.37
Low Social Support	4.70	0.16
High Social Support	6.60	0.35

RESULTS

Baseline self-esteem did not significantly predict time spent on Facebook, time spent on other social media sites, time spent in offline social interactions, nor passive vs. active use of Facebook (all ps<.05; see Tables 2-5).

Table 2			
Effect of Self-Esteem on Time Spent on Facebook			
Source	*df*	*F*	*p*
Between-Subjects			
Self-esteem	1	0.64	0.43
Error	54		
Within-Subjects			
Time Spent on Facebook	18	0.58	0.91
Time Spent on Facebook * Self-esteem	18	1.14	0.3
Error	972		

Table 3
Effect of Self-Esteem on Time Spent on Social Media

Source	df	F	p
Between-Subjects			
Self-esteem	1	1.14	0.29
Error	54		
Within-Subjects			
Time Spent on Social Media	18	0.68	0.83
Time Spent on Social Media * Self-esteem	18	1.25	0.21
Error	972		

Table 4
Effect of Self-Esteem on Time Spent Offline

Source	df	F	p
Between-Subjects			
Self-esteem	1	0.55	0.46
Error	54		
Within-Subjects			
Time Spent Offline	18	1.9	0.01
Time Spent on Offline * Self-esteem	18	0.91	0.57
Error	972		

Table 5
Effect of Self-Esteem on Passive vs. Active Use of Facebook

Source	df	F	p
Between-Subjects			
Self-esteem	1	0.38	0.54
Error	58		
Within-Subjects			
Time Spent Passively vs. Actively	18	0.72	0.79
Time Spent Passively vs. Actively * Self-esteem	18	0.87	0.62
Error	1044		

Baseline perceived social support did not significantly predict time spent on Facebook, time spent on other social media sites, time spent in offline social interactions, nor passive vs. active use of Facebook (all ps<.05; see Tables 6-9).

Table 6
Effect of Social Support on Time Spent on Facebook

Source	df	F	p
Between-Subjects			
Social Support	1	0.01	0.93
Error	54		
Within-Subjects			
Time Spent on Facebook	18	0.76	0.75
Time Spent on Facebook * Social Support	18	1.26	0.2
Error	972		

Table 7
Effect of Social Support on Time Spent on Social Media

Source	df	F	p
Between-Subjects			
Social Support	1	0.86	0.36
Error	54		
Within-Subjects			
Time Spent on Social Media	18	0.95	0.52
Time Spent on Social Media * Social Support	18	1.65	0.04
Error	972		

Table 8
Effect of Social Support on Time Spent Offline

Source	df	F	p
Between-Subjects			
Social Support	1	0.11	0.74
Error	54		
Within-Subjects			
Time Spent Offline	18	1.81	0.02
Time Spent Offline * Social Support	18	0.83	0.66
Error	972		

Table 9
Effect of Social Support on Passive vs. Active Use of Facebook

Source	df	F	p
Between-Subjects			
Social Support	1	0.56	0.46
Error	58		
Within-Subjects			
Time Spent Passively vs. Actively	18	0.77	0.74
Time Spent Passively vs. Actively * Social Support	18	1.31	0.17
Error	1044		

DISCUSSION

Contrary to hypotheses, self-esteem and perceived social support levels measured at baseline were not significantly associated with time on Facebook, active versus passive time on Facebook, time spent on other social media, nor with time spent in offline social interactions. Although analyses performed yielded statistically insignificant results, many participants voluntarily answered debriefing questions regarding their experience with the WeFeel app and the study overall. This feedback may prove useful in combatting some of the limitations of the study.

The literature on how self-esteem and perceived social support affect time spent on social media or in offline interactions are not entirely in line with the results of the current study. One study found that Facebook users with lower self-esteem as compared to those with higher self-esteem, would engage in friending online more often as a way to make up for their low self-esteem (Lee, Moore, Park E., & Park, S., 2012). A second study concluded that those with lower self-esteem seemed to have a "greater sense of belongingness to the Facebook community" (Tazghini & Siedlecki, 2013, p. 830). A third study concluded that Facebook may help students who have low self-esteem overcome barriers and receive benefits such as "increased information and opportunities" (Ellison, Steinfield, & Lampe, 2007, p. 1163). Finally, a study on social support concluded that individuals who have less emotional support in their offline relationships may spend more time on social media to alleviate this (Shensa, Sidani, Lin, Bowman, & Primack, 2015).

One study looked at passive vs. active use of Facebook and concluded that passive use is the dominant activity on social media sites and passive usage is associated with depression and reduced perceived social support (Escobar et al., 2018) Feedback from participants tended to agree with this study. One participant noticed that they were in a better mood when they were active compared to passive on social media. Another participant said that the more time they spent online passively browsing through various social media feeds, the more negatively they tended to view themselves. The topic of passive vs. active use of Facebook is relatively new in the literature and may need to be explored further. In regards to comparing offline interactions and relationships, one study found that "real-world social networks" had a positive association with well-being, while use of Facebook had a negative association with well-being (Shakya & Christakis, 2017). From the debriefing questions, a participant noticed a tendency to be happier

when they had more face-to-face interaction. Another person agreed that the more they were with actual people, the happier they were, but when on Facebook, they felt grumpier. The current study tried to account for outside factors that may have an effect on well-being by asking about offline social interactions. Possible reasons for the disparate results (from the current study's findings) include 1) use of different measures to study social support and time on Facebook (Lee, Moore, Park E., & Park, S., 2012; Shakya & Christakis, 2017; Shensa, Sidani, Lin, Bowman, & Primack, 2015; Tazghini & Siedlecki, 2013); and 2) using retrospective reports of online interactions as opposed to ecological momentary assessment methods (Ellison, Steinfield, & Lampe, 2007; Escobar et al., 2018; Shensa, Sidani, Lin, Bowman, & Primack, 2015; Tazghini & Siedlecki, 2013).

The current set of analyses necessitated treating self-esteem and social support as stable, categorical variables, and were unable to consider missing data points. In consultation with a biostatistician, future analyses will examine how variability in self-esteem and social support during the entire assessment period predict variability in social media usage behaviors using mixed modeling. A number of other study limitations are important to consider. First, using the app WeFeel provided an outlet for participants to easily access surveys and answer questions remotely on their mobile devices. However, the app had some notification issues for a few participants, due to the app being fairly new and participants using a variety of mobile devices. Many of these problems were sorted out quickly and participants were able to resume the study, but other participants continued to have problems with not receiving any notifications. This led to either data that was not randomized because participants would fill out the survey based on their own time preference (since the notifications were not working normally) or missing data points. A few participants did not complete the required amount of surveys or dropped out in the middle of the week.

Second, participants were using the app WeFeel for the first time and may not have been sure of how to fill out the survey accurately. On the WeFeel survey, participants rated other items besides self-esteem and social support, which may be used in future analyses. Participants were asked to rate emotions such as anger, sadness, and disgust, but it was explained to them by the PI that if they had not experienced a particular emotion during that time period, they could either indicate this by putting the scale all the way to the left side or they could not open the scale at all. These scales may not have been clearly distinguished from scales of self-esteem and social support, which needed to be rated from low to high. This became problematic during the study because there was a discrepancy between whether participants had low levels of self-esteem and social support or if they just failed to open those measures. In hindsight, this measurement would need to be more clearly defined in order to receive more accurate results.

Third, participants were mostly college students and although people ages 18-30 are often students, this is not always true. The sample may not have been representative of that population of people. Also, because participants were primarily Caucasian in this study, results may not generalize to individuals from other racial backgrounds.

Fourth, the process of monitoring social media use and levels of mental well-being may have had an impact on reported data over the course of the week. For example, in response to the debriefing questions asked at completion of the study, one participant noted that they tried to restrain themselves from getting angry at work because they would feel embarrassed about reporting it. Several participants noted that doing this study made them more conscious of their time on social media and how it might have been associated with their mood levels. One participant noted that more time on social media tended to make them feel worse about themselves, while another person said that the more they were off social media the happier and more joyful they felt. Other participants noticed that their outlook and mood seemed better with

less social media and the little things they saw on Facebook ate at their confidence. If they reported having a negative reaction to more time on social media, they tended to withdraw and spend less time on social media. Others said that although they cultivated a new awareness of their behavior, they felt like it did not change throughout the week. Some participants said that they tried to use social media more so that they would have more to report on.

Fifth, participant ratings of time spent on social media and offline are subject to estimation biases. Finally, there are likely other psychosocial variables that were not considered that may impact outcome variables. For example, one participant noted that they wished the study had taken into consideration the other factors in their lives, such as stress in relationships, overall health status, sleep quality, etc.

In conclusion, self-esteem and perceived social support levels measured at baseline were not significantly associated with time on Facebook, time on other social media, active versus passive time on Facebook, nor with time spent in offline social interactions. The limitations stated above may aid in designing similar studies in the future that take these points into account. Future analyses will examine how the variability in self-esteem and social support during the entire assessment period predict variability in social media usage behaviors using mixed modeling.

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