Facebook Use and Mood

Julie K. Curtis and Maridee S. Carson

Eastern Oregon University

Abstract

The online social network Facebook has become a favorite pastime but the effects of its use are unknown. Our experiment investigated whether Facebook use results in decreased mood. We attempted to replicate the research by Sagioglou & Greitemeyer (2014) and also analyzed whether post-Facebook use had a significant difference between mood in males and females. We hypothesized that the use of Facebook would lead to a decrease in mood and that males would have a greater decrease in mood than females. We had 71 participants (58 females and 13 males) that were over the age of 18 and spoke English. Participants were divided into three groups. Two groups performed a 20 minute activity using either Facebook (Facebook Group) or browsing online but not on social network sites (Online Browsing Group), and then completed a Positive and Negative Affect Schedule (PANAS) to determine mood. The third group (Control Group) did not perform an online activity but completed the PANAS test which was used as a baseline for mood. The statistical results were not significant for group and there were no interactions between group and gender. Our results did not replicate the findings of Sagioglou & Greitemeyer.

Keywords: Facebook, social networking, social network site, PANAS, mood, depression, gender differences

Facebook Use and Mood

Facebook is the most popular social networking site in the world and currently has over 1.5 billion users per month (Statistica (n.d.)). Because Facebook is a relatively new communication tool, the effects of its use are just now beginning to be discovered. The effects of Facebook use are important to study because much of today's social interaction takes place online rather than person to person. Researchers are concerned that people who use the site may suffer from negative outcomes. Psychologists have documented lowered moods and depression as a result of Facebook use (Steers et al., 2014). Reports of addiction to the site are becoming more common as well (Hormes et al., 2014). Empirical research is necessary in order to understand the risks and to educate the public about a seemingly harmless pastime.

A study by Kross et al. (2013) investigated whether the use of Facebook could predict a decline in the Subjective Well-Being (SWB) of young adults. SWB includes how people feel from moment to moment as well as how satisfied they are with their lives. This correlational study involved three phases. In the first phase participants completed several questionnaires that included the Satisfaction With Life Scale, (SWLS), Beck Depression Inventory, Rosenberg Self-Esteem Scale, Social Provision Scale, as well as a survey about their motivations for Facebook use. During the second phase which lasted 14 days, subjects responded to text messages they received at random times 5 times each day. The text messages included a link to a survey that had five questions that subjects responded to with a slider scale. The questions asked subjects how they felt, if they were worried, if they were lonely, how much they had used Facebook since the last text message, and how much they had interacted with people directly. Phase 3 involved completion of another set of questionnaires which included the SWLS, the

Revised UCLA Loneliness Scale, and they reported the number of their Facebook friends. Not only did the analyses show that the use of Facebook resulted in a decline in how satisfied people were with their lives, but it also showed a decline in how they felt moment to moment. When researchers analyzed whether people had a tendency to use Facebook during the time period that separated two text messages, they found that the more people used Facebook, the worse they subsequently felt (Kross et al. 2013).

Other researchers have also investigated the effect of Facebook use on people's moods. Sagioglou and Greitemeyer (2014) performed a series of three studies to determine whether Facebook use affects the emotions of its users. The first study was a correlational design that examined the relationship between the length of Facebook activity and its users' emotional state immediately following active use of the social network. The subjects were recruited after having been online using Facebook. They answered a 20 question test called the Positive and Negative Affect Schedule (PANAS) to determine their mood. The participants then answered questions about their Facebook and Internet use which included a question about how many minutes they had actively used Facebook immediately prior to their participation in the study. Results showed that positive mood was negatively correlated with the user's active time on Facebook. In other words, the more time that users spent on Facebook, the lower their mood was immediately following that activity (Sagioglou & Greitemeyer, 2014).

The second study performed by Sagioglou and Greitemeyer (2014) compared the emotional effects of Facebook use with a control condition of regular internet browsing or a baseline control condition of no computer use. This study also examined the cause of the decreased mood of users immediately following the use of Facebook. Subjects opened a survey

link and were assigned to one of three groups. The first group spent 20 minutes actively using Facebook and then took the survey. The second group spent 20 minutes actively using the internet, (excluding social network groups) and then took the survey. The third group went directly to the survey in order to provide a baseline score of no computer use. All groups took the PANAS test to determine mood. The two control groups (internet browsing and no computer) did not differ regarding their mood or meaningfulness ratings but the Facebook group reported less positive mood and felt that the last 20 minutes had been less meaningful than the control groups. This study shows that Facebook use results in lower moods than regular or no internet use, and it suggests that the lower mood is a result of feeling like time on Facebook is wasted time.

One might wonder why people use Facebook if they feel that it is a waste of time. This question was addressed by the third study conducted by Sagioglou & Greitemeyer (2014). Subjects were paid a modest amount of money and rated on a scale of 1-10 how they expected to feel after being active on Facebook for about 20 minutes ("1" indicated worse than before and "10" indicated better than before). The results of a one-sample t-test using the sample mean of 6.10 helped researchers understand that the reason people use Facebook is because they make a forecasting error. People expect that the use of Facebook will improve their mood but in reality, based on results from the first two studies, it actually results in decreased mood (Sagioglou & Greitemeyer, 2014).

Similarly, a correlational study by Steers, Wickham and Acitelli (2014) examined the negative emotions experienced by Facebook users. They hypothesized that depressive symptoms that resulted from the use of Facebook were linked to social comparisons. Their first study

divided participants into active Facebook users, non-active Facebook users and non-Facebook users (the latter two groups were subsequently combined). Subjects took an online survey which included information regarding their Facebook use, demographic information, social comparison measures and depressive symptomatology measures. Results showed that the amount of time both males and females used Facebook was positively correlated to depressive symptoms. In addition, the more time that subjects spent using Facebook, the more likely they were to compare themselves to others socially. Results showed that for men but not women, the depressive symptoms from Facebook use was mediated by general social comparisons (Steers et al., 2014).

Steers et al. (2014) also examined whether the depressive symptoms from Facebook use were more specifically mediated by upward, nondirectional or downward Facebook comparisons. Subjects completed a questionnaire similar to the first study but they also made a daily report regarding their Facebook time and logins, completed a Likert scale regarding their Facebook social comparisons, and answered a subset of the Center for Epidemiological Studies Depression (CES-D) test. Results showed that for both men and women, depressive symptomatology as a result of Facebook use was mediated by social comparisons that included upward, nondirectional and downward comparisons. In other words, the depressive symptoms were a result from not only upward comparisons, but from all types of social comparisons. Merely being on Facebook and seeing status updates from friends results in depressive symptoms due to the constant social comparison that occurs in that environment (Steers et al., 2014).

Some Facebook users experienced depressive symptoms related to even more extreme reactions to the use of Facebook. For example, psychologists have seen more and more people

who are addicted to Facebook. Hormes et al. (2014) conducted a cross-sectional survey of whether the use of Facebook was an addiction for some people. The participants were college students that had Facebook accounts and regular internet access. Hormes et al. believed that Facebook use regulation systems, was a non-substance addiction, because it physiologically arouses and contributes to activation of appetitive pathways in response to the use of Facebook which mirrors what is observed in other types of behavioral addiction. Their goal was to assess disordered online social networking use by means of a modified *DSM-IV* diagnostic criteria for alcohol dependence. (The criteria were modeled from the addiction, tolerance and withdrawal effects of the *DSM-IV* and craving was added from the *DSM-5)*. Several other tests were incorporated in the survey to determine addictive traits such as the presence and intensity of cravings, the desire to cut down on Facebook use, thought suppression, and difficulties in emotion regulation. Of those surveyed, about 10% had a problem with Facebook addiction. Behavioral addiction to Facebook had a significant positive association with scores on the Young Internet Addiction Test, a significant association with difficulty regulating emotion, and a significant association with drinking problems (Hormes et al., 2014).

Another study that examined the extreme effects of depressed emotions as a result of Facebook addiction was performed by Blachnio and Przepiorka (2015). It was believed that certain types of people were prone to develop Facebook Intrusions (extensive engagement in Facebook or Facebook addiction). They looked at four different regulation systems and their association with Facebook addiction. First, self-control is associated with higher self-esteem, good interpersonal skills, and a happy and healthy life. Second, self-regulation systems are used to organize a person's thoughts, behaviors and emotions. Third, action orientation regulation

systems are used to regulate behavior, thoughts and emotions in accordance with a person's intentions. Fourth, multitasking regulation systems are used to switch between different tasks or to effectively work on multiple tasks simultaneously. Blachnio and Przepiorka (2015) hypothesized that both self-control and self-regulation would be negatively correlated with Facebook use and that action orientation and multitasking ability would be positively related to Facebook use. Blachnio and Przepiorka (2015) utilized an ad hoc sampling procedure by sending Facebook users a link to online questionnaires which incorporated various tests that measured the use of Facebook, online use without social media and a control group. They assessed the different regulation systems using the following tests: The Facebook Intrusion Questionnaire, the Brief Self-Control Scale, the Self-Regulation Scale, the Action Control Scale, and the Multitasking Scale. The Facebook Intrusion Questionnaire compared the behavioral addiction properties of Facebook by measuring responses to a series of questions (e.g. I have been unable to reduce my Facebook use). The results did not find any association between Facebook intrusion and the constructs of self-regulation or multitasking. However, as hypothesized, participants' Facebook intrusion was related to low self-control and poor action orientation. People with low self-control find it difficult to resist tempting impulses and may spend an exorbitant amount of time on Facebook. People with poor action orientation may use Facebook as an escape from problems to attempt to improve mood. These results confirm that low self-control and low state orientation are predictors of dysfunctional use of Facebook and people who display these constructs are at risk of becoming addicted to Facebook (Blachnio & Przepiorka, 2015).

The above studies demonstrate that time spent on Facebook is negatively associated with mood. Facebook use results in a negative shift in how people feel on a moment-to-moment basis as well as how satisfied they are with their lives (Kross, et al., 2015). People tend to log in to improve their mood but instead they feel worse due to the feeling of wasted time (Sagioglou and Greitemeyer, 2014). Other studies confirm that decreased mood and depression are a result of Facebook use and they attribute those feelings to social comparisons (Steers et al., 2014). Namely, men have negative associations due to social comparisons based predominantly on social status or other hierarchies of importance such as employment status. More extreme examples of decreased mood are seen in cases of Facebook addiction, which have steadily increased over the last few years (Blachnio & Przepiorka, 2015; Hormes et al., 2014). Facebook addiction is a vicious cycle that begins with accessing the site to improve mood but instead this activity is paired with feelings of regret and anxiety. The increased time on Facebook causes depression and yet the user seeks to solve this by additional time spent on the site. The effects of Facebook use are an important area to explore because this is a new method of popular communication, which lacks face to face information, such as body language and tone of voice.

A review of research literature related to the use of Facebook reveals a gap, in that there was a difference in the way men and women socially compare with use of social online networks such as Facebook. Most of the experimental studies that have examined post-Facebook mood have not considered the difference that gender may play in the outcome. As previously discussed, the research by Steers, et al. (2014) found that Facebook use resulted in depressed mood for both male and females. It has been brought to light, however, that when these researchers investigated a correlation between amount of time spent on Facebook and the

depressive symptoms post-use, they found that for men, and not women, it was mediated by social comparisons. This finding suggests that there could be differences in the way that the amount of time spent on Facebook affects different genders. Since this was only a correlational study, an experimental study that investigates gender and the effects of Facebook use on mood would be beneficial to help researchers understand whether a difference exists.

Social comparison is only one possible mechanism that may play a role in negative mood from post-Facebook use. There are numerous other mechanisms that researchers have suggested might mediate the negative mood from post-Facebook use, and gender differences may play a role. For example, researchers have investigated the effects of envy on social network users' subjective well-being (Krasnova, Widjaja, Buxmann, Wenninger & Benbasat, 2015). Although gender differences were not examined, it is very conceivable that envy is processed differently by gender. Men have a tendency to become envious of other men's hierarchy of social status, where women tend to become jealous of another woman's good looks or physical beauty. Another theory proposed in a recent article is that evolutionary psychology is the basis for Facebook depression (Blease, 2015). Gender differences in evolution theory are widely apparent. Other studies have investigated whether post-Facebook mood may be associated with the underlying motivations for the use of Facebook (Rae & Lonborg, 2015). It makes sense that men and women could have very different motivations for why they use Facebook. These differences could certainly impact how Facebook use affects the different genders. For example, men might be more likely to use it for enhancing social contacts to get to know more people, or for use as a network for job connections. Women, on the other hand may be more likely to use it to strengthen social ties with existing family or friends (Serani 2012). If different motivations,

related to gender, mediate the outcomes of the post-Facebook use, then it is imperative to investigate the effects of Facebook use by gender.

Facebook is a relatively new platform and the effects of its use are still under investigation. The amount of research that has been performed on Facebook use and its effects on mood is very limited and many of the studies are correlational in nature. Because of this, experimental research regarding gender and the effects of Facebook use is necessary. In addition, much of the research that has been performed has not included analysis of the effects by gender. The effects of post-Facebook use on mood, as well as its mechanisms, may be different between genders. One way to close this gap in literature would be to specifically implement an array of tests for participants to assess mood after Facebook use while comparing the effects for the different sexes. The research would compare Facebook use to an online browsing session without use of social media sites and a control group in which no computer was used. In order to better understand the emotional effects post-Facebook use, including gender groups, as an independent variable is imperative.

Method

Participants

The participants were recruited through postings on the authors' Facebook pages as well as through undergraduate psychology classes at Eastern Oregon University. Some of the undergraduate students were compensated with extra credit in their classes. Participants who were not students were not compensated. We had 127 people respond to our survey, but 56 of those people were disqualified. The main reason for disqualification was that they had not stayed offline for three hours prior which resulted in discontinuation of the experiment. We were left

with 71 participants (58 females and 13 males) who completed the survey. All participants were over the age of 18 and spoke English. Participants were required to have a Facebook account. Exclusion criteria for this study was for any participants who did not have a Facebook account or who had been online during the three hours prior to the experiment.

Materials and Procedure

Participants accessed a survey link that was hosted by SurveyGizmo. The link was provided through a Facebook post or through an undergraduate psychology class. The participants were divided by birth month into three groups which included a Facebook activity group, an Online browsing group (avoiding social media sites), and a Control group (no computer use). The Facebook condition group was instructed to spend 20 minutes of active time (i.e. posting, looking at pictures or videos, chatting) on Facebook and immediately return to complete the survey. The Facebook participants were also asked if they felt that their time spent on Facebook was meaningful or wasted time. The Online browsing group was instructed to spend 20 minutes actively using the internet but without accessing any social network sites and then to return to the survey. Participants of both these groups were informed that approval of their participation was dependent on them following the instructions and that a time stamp on the survey page would be used to verify the actual time they returned to the survey after completing their activity. The Control group went directly to the survey and did not perform an online activity. The first item in the survey included a 20 Item PANAS test (Appendix 1) to determine the participants' mood. The survey also included questions regarding general Facebook use.

Design

This was a between-subjects experiment that examined the participants' mood either post-Facebook use, online computer use, (without social media sites), or the control group, which went straight to the questionnaire. Prior to participation subjects were informed that they should abstain from online computer use for three hours prior to the experiment. Participants completed an informed consent approved by Eastern Oregon University's Institutional Review Board (IRB) and answered demographic questions. Participants were assigned to one of three groups based on their birth month: 1) Facebook activity group, 2) an Online browsing group, or 3) a no-activity Control group. The Online browsing group served as a control to make sure that the Facebook group results were specific to the use of Facebook and not simply results for using the internet in general. The no-activity Control group served as a baseline measure for mood. After participation in one of the three groups, the participants answered some follow-up questions specific to Facebook use, such as how much time they generally spent on Facebook and for what purpose. Debriefing information about the experiment was provided at the conclusion of the experiment.

Results

Our hypothesis was that Facebook use would result in lower moods and that males would have more diminished moods than females. We first investigated whether there was a significant difference between the PANAS test scores of the different groups. A one way between subjects ANOVA showed no effect for group $F(2,68) = 0.9$, $P = 0.42$. In other words, participants in the Facebook group performed no differently than those in the Online or Control groups, as illustrated in Figure B1. Even though the results were nonsignificant for mood between the groups, we wanted to investigate whether there were absolute differences between males and

females as well as the three groups. A between subjects two-way ANOVA test revealed that there was a nonsignificant effect of Group, $F(2,65) = 0.9$, $p = 0.43$. Results showed no effect of Gender, $F(1,65) = 0.3$, $p = 0.57$. Finally, there was no interaction between Group and Gender, $F(2,65) = 1.0$, $p = 0.39$. *Figure B2* shows the effects of and interactions between Group and Gender. From the output of our analysis, we can see that there were no significant effects or interactions in this experiment; therefore, Sagioglou and Greitemeyer (2014) could not be replicated.

Discussion

The purpose of our experiment was twofold. First, we wanted to replicate the experiment performed by Sagioglou & Greitemeyer (2014), wherein they determined that Facebook use resulted in decreased mood. Therefore, we hypothesized that the use of Facebook would result in decreased mood. Based on a factorial analysis, our experiment failed to replicate the findings of Sagioglou & Greitemeyer (2014). Second, we wanted to expand upon Sagioglou & Greitemeyer by examining whether decreased mood as a result of Facebook use was significantly different between genders. Based on research about Facebook and social comparison that was performed by Steers, Wickham and Acitelli (2014), we hypothesized that men would have more decreased mood than females. Factorial analysis of the genders and groups did not show significant differences of mood.

Our failure to replicate the Sagioglou & Greitemeyer experiment was unexpected because our experimental methods closely followed theirs. As in the Sagioglou & Greitemeyer (2014) study, our participants were assigned to one of three groups: Facebook, Online or a Control (no computer) and the online activities lasted 20 minutes. In both studies the participants were

recruited online and the subjects participated from their own location at a time that was convenient for them. Both studies informed participants that there was a time stamp on the page and approval of their participation depended on having spent the appropriate amount of time on the activity. To encourage compliance, our experiment also provided a visible timer and the survey could not be accessed until twenty minutes had expired. To determine mood, both experiments had the participants take a PANAS test. The PANAS items that assessed negative affect (n=10) were reverse-scored and combined with the positive affect items so that there was a single score that indicated more positive moods for higher values. Both experiments used the PANAS test scores of the no computer group as the control for analysis.

One possible explanation for our inability to replicate the experiment by Sagioglou & Greitemeyer (2014) might be due to lack of control over participants and the inability to insure their compliance with the research requirements. As stated, both experiments were conducted online and were dependent on the participants following the instructions. Even with use of a time stamp to encourage compliance, there was no way to know whether or not people were actively doing their assigned activity. For example, one of the researchers in this experiment received a Facebook comment from one of the participants that they felt the experiment could not provide accurate results because it did not compare how active a person was on FB for the required 20 minutes before they answered the questions. The participant then described how they "scrolled [Facebook] for about five minutes, didn't see anything interesting and spent the rest of the time emailing a few friends." There is no way to know whether this was an isolated case or whether such behavior was common. Unless the research is performed in a lab, there is no way to determine how many of the participants followed the instructions.

This experiment had a few differences from the Sagioglou and Greitemeyer (2014) experiment and those differences may explain our failure to replicate their findings. To insure that all participants had the same amount of online activity time, this experiment required that subjects were completely offline for three hours prior to their participation. Given that participants were recruited online, it was extremely likely that many of them had already been online or on social networks for long periods of time prior to their recruitment. Sagioglou and Greitemeyer (2014) did not take prior online activity into account. We believed that requiring participants to be offline for a period of time before the experiment would allow us to better assess the effects of Facebook use; however, we still expected that we would obtain results similar to Sagioglou and Greitemeyer. In light of our failure to replicate their findings, this calls into question whether participants' online activity preceding their experiment could have unknowingly altered their results. Given that Sagioglou and Greitemeyer found a significant effect for decreased mood but did not know how long their participants had truly been online, it is possible that their results may have been inaccurate and that might be why we could not replicate it.

Our requirement that participants remain offline prior to the experiment could also have introduced a potential bias. For example, participants may have been more likely to participate during certain times of day such as first thing in the morning or immediately following work in order to mitigate the inconvenience of being offline. Participation at certain times of day could have positively impacted their moods and impacted our results, which could also explain our inability to replicate the experiment by Sagioglou and Greitemeyer (2014).

Another difference between the two experiments was the information given to the participants about the topic of the research. Sagioglou and Greitemeyer (2014) told their participants that the experiment was about "the relation of Internet use and emotions" (p. 360), although they did not tell them it was specifically about Facebook. We were very careful not to disclose that the experiment was about emotions and only referred to it as an experiment with regard to online social networks and online browsing. This was to insure that the participants were not consciously thinking about their emotions until the online activity was complete and they were asked to complete the PANAS test. This was a significant difference between the two experiments and knowledge of the research topic in the Sagioglou and Greitemeyer experiment could certainly bias the participants and account for their finding of decreased mood with the use of Facebook whereas not knowing about the subject matter, as in our experiment, could explain the result in a very different finding.

Summary

The results of our experiment did not replicate the findings of the research by Sagioglou & Greitemeyer (2014). We did not find that the use of Facebook resulted in decreased mood. In addition, we did not find that males had more diminished mood as a result of Facebook use than females did. We believe that our inability to replicate the Sagioglou & Greitemeyer experiment could be due to lack of compliance of research subjects due to the experiment being performed outside of a controlled environment. We also believe that this could be due to Sagioglou and Greitemeyer not taking into account previous time spent online. Finally, it could also be due to participants in the Sagioglou and Greitemeyer experiment having knowledge that the experiment was focused on emotions. We encourage further exploration of the topic by having better control

over participants. This would include performing the experiment in a controlled environment, limiting knowledge of the subject matter, and limiting online computer use during the time immediately prior to the experiment.

References

Blachnio, A., & Przepiorka, A. (2015). Dysfunction of self-regulation and self-control in facebook addiction. *Psychiatric Quarterly.* doi:10.1007/s11126-015-9403-1

Blease, C.R. (2015). Too many 'friends', too few 'likes'? Evolutionary psychology and 'Facebook depression.' *Review of General Psychology 19*, 1-13. doi:10.1037;gpr0000030

Hormes, J. M., Kearns, B. & Timko, C. A. (2014), Craving Facebook? Behavioral addiction to online social networking and its association with emotion regulation deficits. Addiction, 109, 2079–2088. doi: 10.1111/add.12713

Krasnova, H., Widjaja, T., Buxmann, P., Wenninger, H., & Benbasat, I. (2015). Why following friends can hurt you: An Exploratory investigation of the effects of envy on social networking sites among college-age users. *Information Systems Research 26*, 585-605.

Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D., Lin, N., . . . Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PlosOne 8*. doi:10.1371/journal.pone.0069841

Rae, J.R., & Lonborg, S.D. (2015). Do motivations for using Facebook moderate the association between Facebook use and psychological well-being? *Frontiers in Psychology, 6,*771. Doi:10.3389fpsyg.2015.00771

Sagioglou, C., & Greitemeyer, T. (2014). Facebook's emotional consequences: Why Facebook causes a decrease in mood and why people still use it. *Computers in Human Behavior 35*, 359-363. http://dx.doi.org/10.1016/j.chb.2014.03.003

Serani, D. (2012), Facebook and Depression: whether bonding or bridging, it's all about your

user pattern. Psychology Today Retrieved from https://www.psychologytoday.com/blog/two-takes-depression/201206/facebook-and-depression

Statistica, Number of monthly active Facebook users worldwide as of 3rd quarter 2015. (n.d.) Retrieved from http://www.statista.com/statistics/264810/number-of-monthly-active-facebook-users-worldwide/

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 & Clinical Psychology, 33*, 701-731.

Watson, D., Clark., L. A. & Telligan, A. (1988) Development and Validation of brief measures of positive and negative affect: the PANAS scales Journal of Personality and Social Psychology, 54 (6), 1063-1070.

Appendix A

Worksheet 3.1 The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988)

PANAS Questionnaire

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is at this present moment OR indicate to the extent you have felt this way during the past week (circle the instructions you followed when taking this measure).

	(1 pt) Very Slightly or Not at All	(2 pts) A Little	(3 pts) Moderately	(4 pts) Quite a Bit	(5 pts) Extremely
1. Interested	○	○	○	○	○
2. Distressed	○	○	○	○	○
3. Excited	○	○	○	○	○
4. Upset	○	○	○	○	○
5. Strong	○	○	○	○	○
6. Guilty	○	○	○	○	○
7. Scared	○	○	○	○	○
8. Hostile	○	○	○	○	○
9. Enthusiastic	○	○	○	○	○
10. Proud	○	○	○	○	○
11. Irritable	○	○	○	○	○
12. Alert	○	○	○	○	○
13. Ashamed	○	○	○	○	○
14. Inspired	○	○	○	○	○
15. Nervous	○	○	○	○	○
16. Determined	○	○	○	○	○
17. Attentive	○	○	○	○	○
18. Jittery	○	○	○	○	○
19. Active	○	○	○	○	○
20. Afraid	○	○	○	○	○

Scoring instructions:

Positive Affect Score: Add the scores on items 1, 3, 5, 9, 10, 12, 14, 16, 17 and 19. Scores can range from 10-50 with higher scores representing higher levels of positive affect. Mean Scores: Momentary = 29.7, (*S.D.* = 7.9); Weekly = 33.3 (*S.D.* = 7.2)

Negative Affect Score: 2, 4, 6, 7, 8, 11, 13, 15, 18 and 20. Scores can range from 10-50 with lower scores representing lower levels of negative affect. Mean score: Momentary 14.8, (*S.D.* = 5.4); Weekly = 17.4 (*S.D.* = 6.2)

PANAS Test. From Watson, D., Clark, L.A., & Tellegan, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. Journal of Personality and Social Psychology, 54(6), 1063-1070.

Appendix B

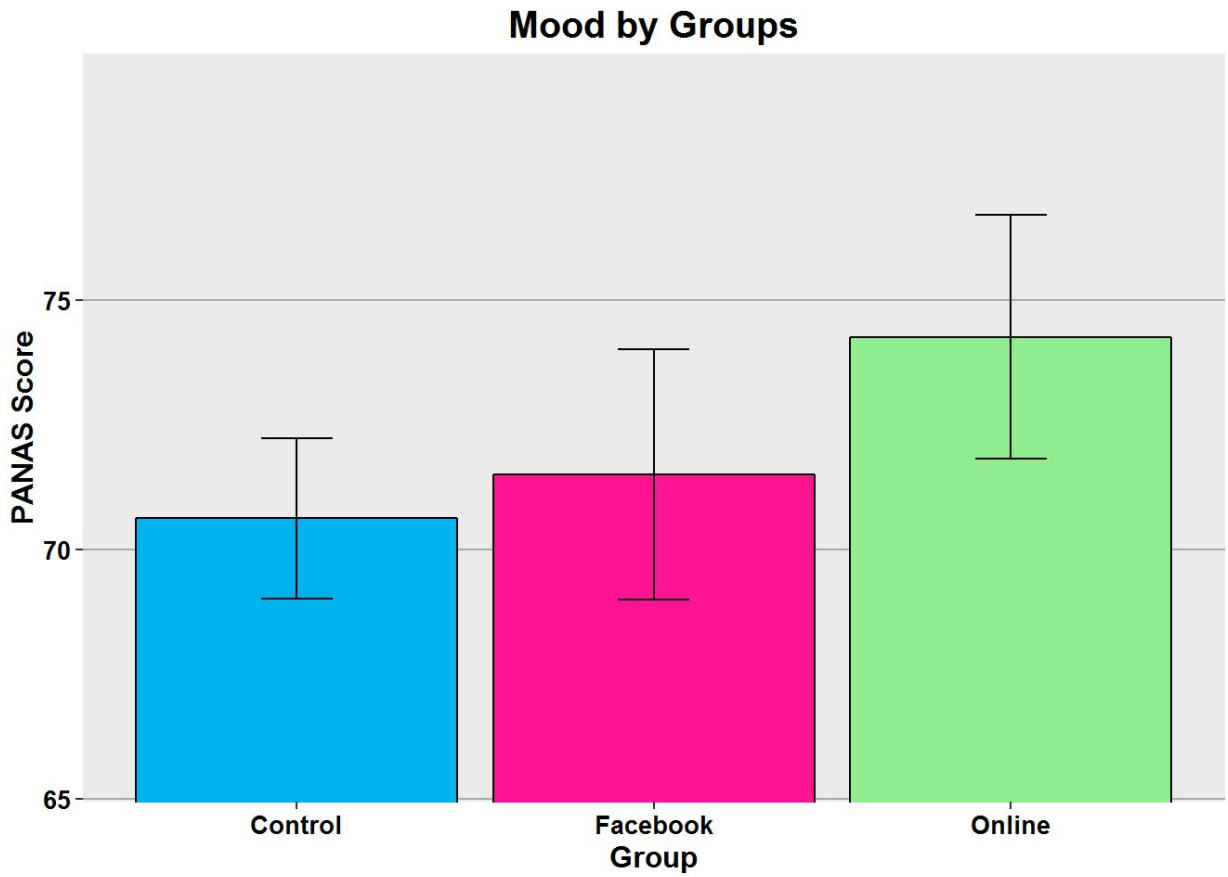

Figure 1. Mean PANAS test scores by group. Higher PANAS scores indicate greater positive affect. Standard errors are represented in the figure by the error bars attached to each column.

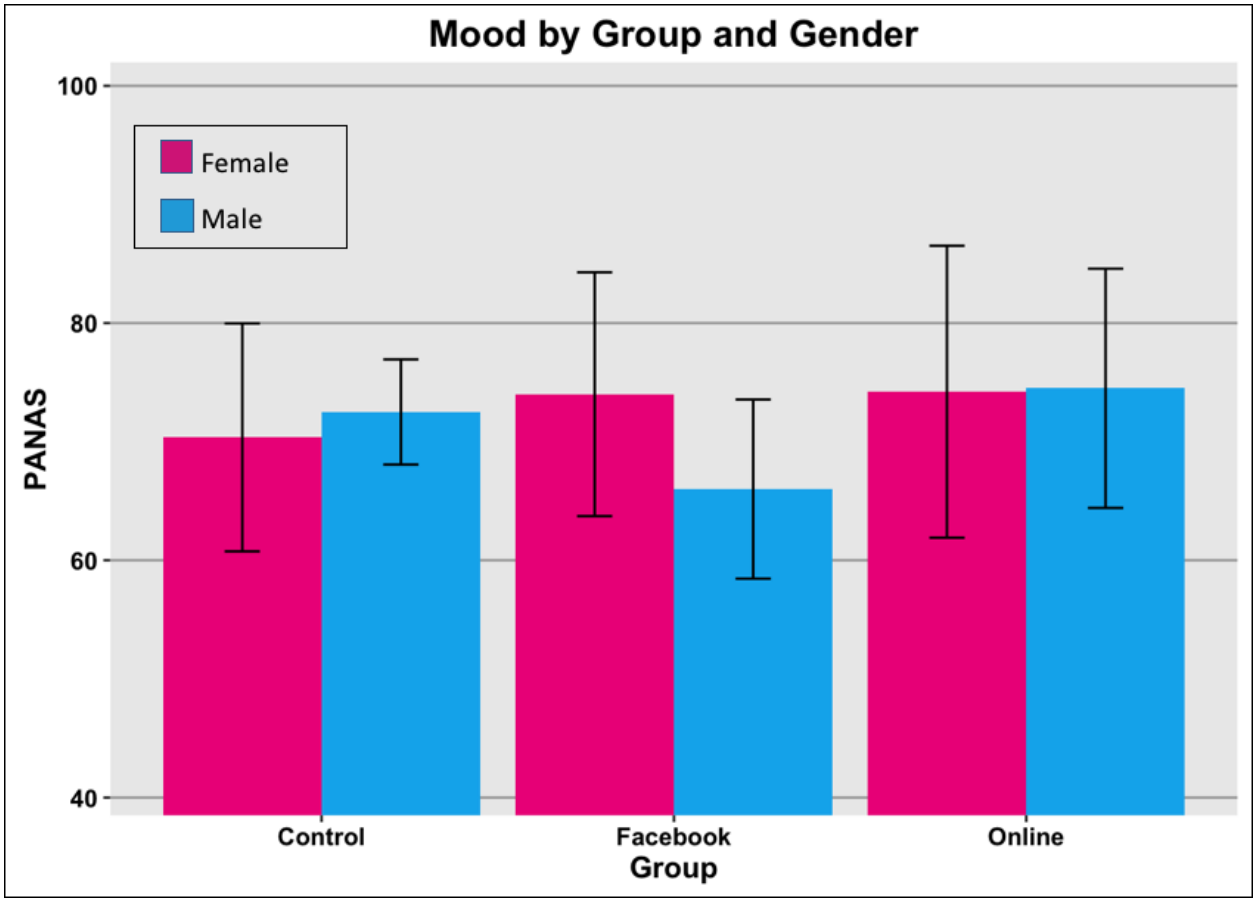

Figure 2. Mean PANAS test scores by group and gender. No significant differences were found between groups or genders. Higher PANAS scores indicate greater positive affect. Pink bars indicate female test scores and blue bars indicate male test scores. Standard errors are represented in the figure by the error bars attached to each column.