**Social, Emotional, and Neurological Effects of**
**Intermittent Detachment from Social Media Use**

Olivia Brown

Malone University; HON 496

April 27th, 2020

Adviser: Dr. Lauren Seifert, Ph.D

Submitted in Partial Fulfillment of the Requirements for Graduation

from the Malone University Honors Program

## Abstract

The continuous use of social media is a fluid topic of discussion forming from internet and gaming research, and interweaving between the disciplines of psychology, sociology, and communication. Society's increasing access to technology allows for constant connection and instant gratification, due to the often-immediate ability of virtual correspondence. In this thesis, I first address the brain functions interlocked with the seemingly growing need to access social media. A study was conducted with 30 participants who were asked to fill out a self identified survey of their attachment to social media. They were then asked to detach from five specific social media for varying amounts of time, keeping record each day of their schedule and emotions. From both qualitatively and quantitatively analyzing this data from participants, the benefits of intermittent separation from forms of social media are concluded, as several participants reported the value of their detachment period.

**Acknowledgements**

I would like to extend the warmest thank you to those who have supported me during this discovery process. I would like to particularly thank my "Core Four," my closest Honors friends who pushed me every step of the way, especially when I couldn't gather the motivation on my own. This process has shown me the true support system of encouragers in my life, and for this I am extremely grateful.

# Contents

**Introduction**

The ever changing and expanding industry of social technology impacts the entire world. Over 3.5 billion people own a smartphone with access to social media applications such as Twitter, Instagram, Snapchat, Facebook, and Tik Tok (Holst, 2019). From Pew Research et. al., as of 2019 in the United States, 96% of all adults have a mobile cell phone, and 81% are smartphone owners. All humans in connection with others and who actively participate in today's society can be affected by social media, particularly a younger cohort of current teenagers, having grown up so intertwined with cellular advancements.

Redirecting from the macro to the micro, exploring the reward processing systems within the midbrain may provide some clarity as to why the cellular age is so prominent in our culture now. Due to the vast amount of users, the susceptibility to habit-forming tendencies and addiction to social media is pressing. Of the seven main neurotransmitters prominent in the reward and compulsion cycle, dopamine is a strong candidate for the maintenance of addictive and habit-induced behaviors. It is an endogenous substance that affects every individual's perception of pleasure and motivation. Something as small as a notification on the home screen, a "like" on a post, or a positive comment on a photo can all contribute to the cycle that drives the motivation to check applications. Without always identifying or recognizing the urge to do so, the brain is wired to seek this short burst of pleasure obtained from minute interactions on our mobile devices. **This leads me to question, what are the social, emotional, and neurological effects of intermittent detachment from social media use?**

By looking to further understand the brain functioning that aids in the newly classified and disputed "addiction" to social media technology, more about our changing culture can then be understood. From the time that I, a 22 year old woman, was in middle school, there has been rapid growth to our world's usage of technology and social sharing sites. The popular application Snapchat was created when I was a freshman in high school, and was a very simple beta testing with the only function being to send a single picture to another person. I was introduced to social media early in my teen years, but it leads me to question about the cohort of 12-18 year olds, who have potentially grown up from close after birth knowing how to record and scroll on a device before they could read and distinguish the choices they are making.

There has been a significant amount of literature on brain mechanisms and neural processes related to gaming addiction, gambling, and internet use. With the changing field of technology, and the fact that social technology specifically has significantly changed even within the last eight years, providing new and updated research is a meaningful course of study.

Benefits to neurobiological research on this topic include a better understanding of the ways that technology, social media, and application advancements are affecting our bodies, and therefore affecting our emotional and behavioral habits and well-being. Modern society can learn to cultivate healthy habitual practices, for instance pursuing an intentional detachment from mobile devices for a designated amount of time.

## Review

Neural functions behind social media tendencies offer an abundance of research that supports cognitive social drive for participating online. Culturally, there are adaptive advantages for participating in the rise of social media use. "Managing one's reputation

within a group enhances survival rates by helping to sustain successful social connections," (Meshi, Tamir, Heekeren, 2015, p. 772) and parallels the fulfillment of social inclusion and survival of biological needs. Five key social media behaviors include: broadcasting, providing and receiving feedback, observation, and comparison (Baumeister & Leary, 1995). The neural systems that encourage social media use are classified by social cognition, self referential cognition, and social reward processing. The most meaningful to my research would be social reward processing, activating the ventromedial prefrontal cortex, ventral striatum, and ventral tegmental area (Fareri & Delgato, 2014). The networks created online parallel the offline relational aspect presented between real world networking, and provide researchers with methods of study beyond in-person communication.

A report within the same literature from Baumeister et al. (1995) included two studies showing a positive correlation between the size of the amygdala and social network size. They examined the grey matter density within participants as well as their online social presence and communication, and drew conclusions as to whether or not the two were related. Online social interaction plays a role in changing crucial brain mechanisms and their functioning over time, as the amygdala itself plays a key role in processing emotional responses.

The constructs of personality can also hold a significant role in the decision to engage online. The five factor model of personality includes openness to experience, extrovertedness, conscientiousness, agreeableness and neuroticism (Wilson, Fornasier, & White; 2010). Negative correlations were found between extrovertedness and agreeableness, indicating the potential of an introverted person who struggles to socially interact would be more inclined to participate frequently on the internet. In regards to

the addictive qualities produced by websites, Wilson et. al. (2010) indicated that internet addiction is classified by the scale of tolerance, salience, mood modification, relapse, conflict and withdrawal symptoms. This study was done in the light of social networking sites, referred to as SNSs, and indicates behavioral tendencies that predict addictive tendencies, such as extrovertedness or level of self esteem. Extroverts require a significant amount of stimulation and thus a larger social circle, presenting a hypothesis of why they may be more inclined and attracted to social networking sites. This would also be an interesting topic of discussion for further research, as personality types may drive different behavioral habits and inclinations.

Researchers Eijnden et. al. developed a "social media disorder scale," (SMD), within an article identifying the lack of a diagnostic approach to an overarching internet addiction, meanwhile drawing parallels to a commonly researched Internet Gaming Disorder (IGD). Using a similar measurement tool as what was created to identify IGD, an assessment was created to determine whether or not adolescents were simply high functioning social media users, compared to disordered social media users (Eijnden, Lemmens, Valkenburg; 2016). A short 9 item scale was used, as well as a longer 27 item scale with three questions from each category. Relevant categories to my research include tolerance, persistence, and escape. Particularly, tolerance seems interesting because it relates to the change over time of social media usage, and begs the question of why people are becoming less attentive, or spending more and more time online. The gap in the literature on social media was lessened by this acute measurement tool provided by this research, and can be helpful in identifying questions that would be meaningful to my further research.

Similar to the SMD scale, problematic internet use (PIU) is a researched topic of literature within the field. The literature, as of 2013, is fairly thin and often proves comorbidity with other diseases or disorders, making PIU a difficult diagnosis due to so many relational factors (Spada, 2014). Problematic internet use is closely related to impulse control disorders, as well as compulsive addictive use of substances, gambling, etc. Researchers Bernardi and Pallanti (2009) found that adolescents who binge drink have a higher risk of developing or struggling with PIU, and there are strong links to a comorbid mild depression, known as dysthymia. Other factors such as social anxiety, gambling impulses, and depressive symptoms are all present in relationship to these. PIU "anomalies" in serotonin transporter genes were shown to emit higher levels of depression. Due to the nature of psychiatric disorders, treatment for PIU has been evasive to nail down, though Spada (2014) concludes from case studies that including medicine such as Naltrexone and Quetiapine have proven to be effective in curbing the compulsion. The development link between serotonin or dopaminergic transporter genes and the presence of internet disorders is a topic for further research.

The reinforcement of behavior that users obtain from the habitual use of cellular devices and social media mimics the reward processing of an addictive substance. The same dopaminergic pathways are activated from a simple reward such as a positive notification or feedback from a photo (Saal & Malenka, 2005). Social networking has also adapted in terms of the surplus of notifications sent in order to draw in the user. By increasing notifications, content is directed strongly at phone "pickups," and whatever would result in reopening the application or site. Reward prediction error coding strategically keeps the brain engaged in the activity with a mixture of positive and negative outcomes from the action of opening a notification. These actions project on our

brain functioning and parallel the behaviors of a true substance addiction. Malenka et. al. (2001) reiterates that the neural substrates that compel compulsion and addictive tendencies stem from the dopaminergic system in the VTA. The "reward circuit" associated with pleasure seeking gives an understanding of substance addictiveness, and is linked to the compulsive need to find that pleasure again.

A fundamental concern linked to electronic devices and cell phone use is humans' exposure to electromagnetic radiation (EMR) (National Radiologic Protection Board, as cited by Aboul Ezz, Khadawry, Ahned, Radwan, & El Bakry, 2013). One way to better understand the effects on humans is to use an animal model, such as Rattus norvegicus. Aboul Ezz et al. (2013) studied exposure to EMR in rats in order to evaluate the effects of daily pulsed radiation on hypothalamus, hippocampus, midbrain, and medulla. They used high-performance liquid chromatography (HPLC) and fluorescence imaging. Effects on dopamine (DA), norepinephrine (NE), and serotonin (5-HT) were observed, including declines in hippocampal DA, with increases in NE and 5-HT at varied exposure intervals and after ceasing daily EMR exposures. Similar changes were observed for hypothalamic DA, NE, and 5-HT, but like DA, NE appeared to decrease in the midbrain, while 5-HT increased. On the contrary to the above mentioned findings, medullary DA increased as did NE and 5-HT, although at different lengths of exposure. Overall, consistent with other research, this study by Aboul Ezz et al. may raise concerns about whether EMR exposure can inhibit learning and memory functions by increasing 5-HT and decreasing DA in the hippocampus. This is certainly a concern for humans, should it be the case that EMR affects human monomamines similarly.

Habitual action, though a less severe predecessor to addictive behavior, automates much of our daily lives that do not require an excess of thought, like brushing

your teeth or backing out of the driveway (Duhigg, 2012). These activities can form a "habit loop," which requires a trigger stimulus to activate the behavior, and then a reward which in turn promotes the behavior and automates the process. Duhigg et. al. expands on the neurological functions at play in decision making, which would include the prefrontal cortex. Yet, our habit continuation occurs in the basal ganglia, which affects development of emotions as well as pattern recognition. In turn, as soon as an action becomes automated, it requires much less thought and maintenance, which supports the "loop".

Habitual action is a primary thought of present day social media use, and that humans are prompted by an automated process that forms into a habit from constant access to our cell phone and online engagement. The purpose of this study is to explore further and identify whether or not this habitual behavior is identified and supported in a real world and modern scenario.

**Method**

**Participants**

I conducted a study of students at Malone University focusing on the effects of social media disconnection over the course of a week. This took place from Monday, February 24th to Sunday, March 1st of 2020. It is to be noted that this study was proceeded prior to the nation-wide Stay at Home orders of 2020. There were thirty students who participated and were compensated for their involvement (27 female and 3 male). They were selected on a voluntary basis, after the student body received an informational email regarding the study, and chosen by the chronological order of their pledged willingness. They were then assigned at random to one of two conditions.

**Materials and Procedures**

There were two groups in this study and fifteen participants in each group, in order to compare the difference between disconnecting completely from social media for one week, versus a designated time of one hour without social media from each day. Participants in the first group (labeled Group #1) were asked to turn their social media applications off, or delete the physical applications from their phone, for an hour a day during what would typically be their recreational time for that day. They were able to choose this time, and it could be different each day depending on scheduling and commitments. Social media applications included the primary five, as defined from a survey done by Malone University's residence life office, of Tik Tok, Snapchat, Instagram, Twitter, and Facebook. Participants in the second group (labeled Group #2) were asked to have deleted these applications for the entirety of the weeklong study.

Because of the need for a randomized assignment of subjects in the study, two informational meetings were held in order to give the willing participants their information and explain the process of the upcoming week. Participants were assigned to groups at random, instructions were verbally explained to them, and their consent forms were signed during these meetings.

Participants were asked to complete the 27 item Social Media Disorder Scale (Eijnden, Lemmens, Valkenburg; 2016). This was anonymously completed during the informational meetings as well, and collected with consent forms to be analyzed after the conclusion of the study. The title of the scale was omitted, as well as the titles of the subscales for classification of response, so that the participants were unaware of grouped themes (See Appendix C).

A screenshot of the participants' weekly average "screen time" was also requested, to later measure any potential change in the average of the week following. Participants were asked to keep a daily log or journal of the emotions they experienced on each day, but also as the course of the week progressed, reflecting on any change of perspective, levels of anxiety, or other emotions they experienced. The journal questions are included in Appendix A. After the study had been concluded, another screenshot was to be requested, to determine if the students filled their detachment time with other distractions (games, photos, etc.) on their cellular device, or by choosing other activities which would decrease this average. In addition, two weeks following the study, a third screenshot was to be requested, to evaluate the consistency of change in time on social media and with a screen present in general. As an incentive for students to participate, the first 30 students who showed willingness and fully completed the study were awarded a $10 gift card if they were placed in Group #1, or a $35 gift card if they were a part of Group #2.

<div align="center">**Results**</div>

**Screen Time Reports**

While in theory, the original screen time report would have been a useful measure of data in comparing a change over time as a result of the study, the data results were unreliable. Some participants did not have their screen time turned on within their device, and for others, it was only tracking partial days throughout the week. The screen time report post-study would need to be compared to the report of the same participant for accurate data, and having only some participants able to provide this information was not feasible. This data was discarded as it was deemed inconclusive, because it was not

an accurate measurement or representation of the participant's usual time spent on their social media.

**Data from the Social Media Disorder Scale**

All thirty participants of the study anonymously completed the Social Media Disorder scale (Eijnden, Lemmens, Valkenburg, 2016) and their responses were compiled to form averages from the original study's subscales. The nine subscales, namely the organizational themes of the questions and criterion for diagnosis of SMD, are preoccupation, tolerance, withdrawal, persistence, displacement, problems, deception, escape, and conflict.

The results as broken down by each subscale criterion ranged from 8.9% to 74.4% of those answering "yes." All item descriptions are found in Appendix C. The results were also taken into consideration by each subject, with a range of 1 to 17 questions that were answered "yes" per participant. By the intensive purposes of the original study, those answering yes to many questions are more likely to identify as having a social media disorder. The highest response rate was for the Displacement subscale, with an average of 74% of "yes" responses, with a 95% confidence interval from 64% to 82%. This was closely followed by Persistence (61%) and Preoccupation (51%). The three items from the Displacement subscale included the questions of if, during the past year, the participant has:
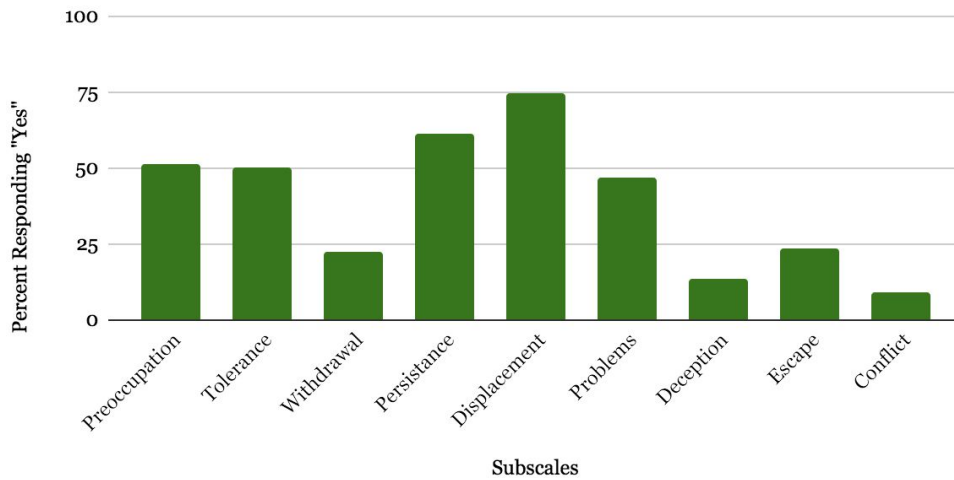
"... regularly used social media to take your mind off your problems?"

"... often used social media to escape from negative feelings?"

"... often used social media so you didn't have to think about unpleasant things?"
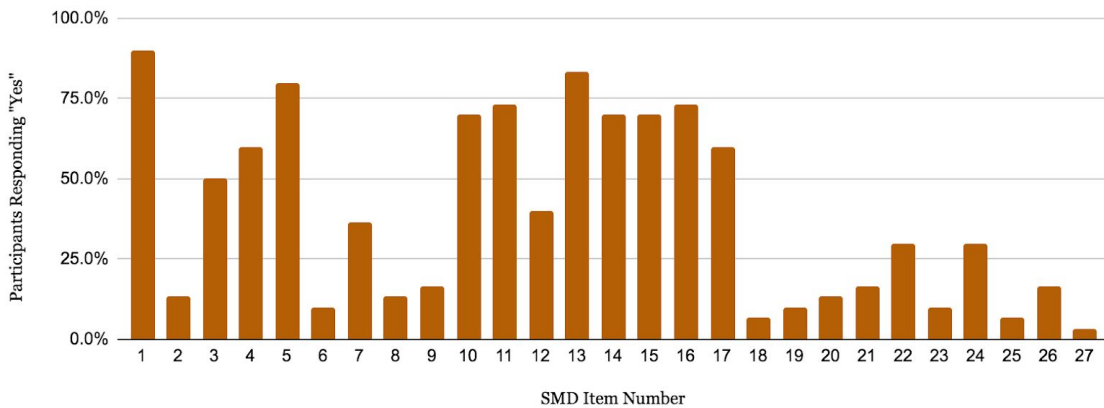
## Social Media Disorder Subscale Responses

Average Percent of "Yes" Responses to Items in a Given Subscale



## Social Media Disorder Item Responses

Participant Responses



It is interesting to note that in the original sample population from Eijnden et. al., specifically for the Displacement criterion, there was only an average of 20% of yes responses from the three questions. Their reported highest criterion score was Preoccupation, followed by Tolerance and then Escape. In the present study, a question falling under the Preoccupation subscale that reads, "During the past year, have you often found it difficult not to look at messages on social media when you were doing

something else (e.g. school work)?" had a total of 90% of participants that answered yes. This would be an area for further research and discussion, and given that our tests were conducted anonymously, this was not able to be interpreted further. The responses have also been included in the graph below per item number (see Appendix C).

**Inductive Thematic Analysis**

After reviewing the data and journal reports from participants, the thematic analysis from the information revealed similar themes in the conclusions and thoughts the participants had. (Hatch, 2002) It is to be noted that Dr. Lauren Seifert and I reviewed the documents separately, without discussion, to begin the process. We then came together on several occasions to discuss the findings, and reached consensus on the thematic analyses presented here. This instilled our thematic analysis with rigor (Hatch, 2002). In addition, data were quantitized to provide cross-checking for the qualitative analysis. The collective themes were organized as follows:

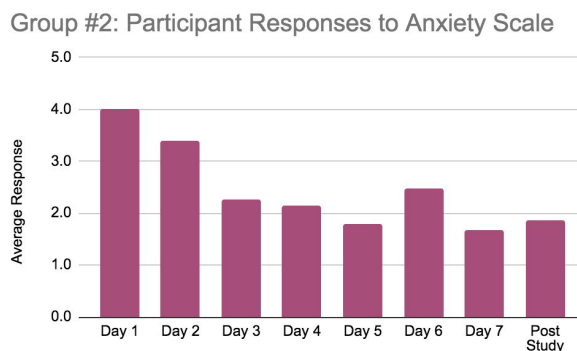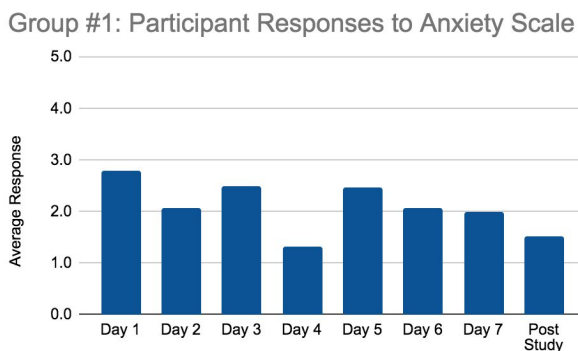| *Inductive Thematic Analysis* |
|---|
| Decrease of Anxiety |
| Distraction |
| Habit and Productivity |
| Connection vs. Separation |
| Willingness of Future Detachment |

*Decrease of Anxiety*

A recognized pattern shown from quantizing the participant's reports was how their levels of anxiety fluctuated throughout the week. Each of the seven days required the participants to report, on a scale from zero to ten, how anxious they felt about their

"decrease of social media" for that day. The average response, by group and by day, are listed below.

| Average Responses to Scale by Day | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 | Day 6 | Day 7 | Post Study |
|---|---|---|---|---|---|---|---|---|
| Group #1: 1 hour per day | 2.8 | 2.1 | 2.5 | 1.3 | 2.5 | 2.1 | 2.0 | 1.5 |
| Group #2: Weeklong | 4.0 | 3.4 | 2.3 | 2.1 | 1.8 | 2.5 | 1.7 | 1.9 |



Group #1: Participant Responses to Anxiety Scale



Group #2: Participant Responses to Anxiety Scale



Participant Responses to Anxiety Scale
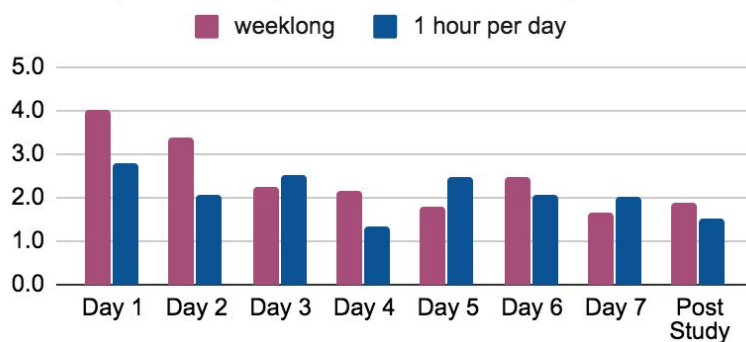
Average Responses to Scale by Day

From this, the general decrease of response value by day can be seen. The trend follows in both graphs, as laid out side by side for a closer comparison between the two. Group #2, the participants who detached from social media for the entirety of the week, reported it causing them more anxiety overall, as almost all the scale responses are

higher. There is also a larger range, 2.3, in responses for the weeklong group as compared to the one hour group, which had a range of 1.5 difference overall.

Also a notable trend in the data is the overall common jump in scale response around days five and six. This is seen in both groups, regardless of the one hour or week-long commitment. Some participants noted this, that it was around the fifth day in the study that it was obvious to them the difference between those around them who were constantly on social media, or again felt the need to engage online crop up. Participant #6, from Group #1, jumped from a self rated score of 3 on the fourth day to a 6 on the fifth day. This person indicated that "I can normally go a couple hours reading without wanting to get on my phone, but I think knowing that I couldn't get on it made me think about it and want to get on it." Participant #1, reporting a 1 on day five but wrote a 6 on the sixth day, said that the hour off social media caused them to be "highly irritated" and "drained," and when after the hour was over for day six, they were "happy to have an outlet."

### *Distraction*

Many participants described using their electronic devices to fill time when they were bored, or as a form of distraction from something else. It was also clear from the data that those with busier schedules found it easier to detach from their social media, as many stated this. The present study, from the lack of use of social media, prompted many to find other sources of distraction instead, as a way to fill that time or space that would normally be spent online.

One participant in particular, #23, indicated that they felt annoyance at the inability to engage with their social media. They opted to take a nap or watch Netflix for the hour each day instead, while another participant chose the creative app Pinterest to

fill that time as well. Three participants stated that they scrolled through Venmo in place of social media, which is a money transfer application that allows you to see what your circle of acquaintances have been sending or receiving money for. This is an interesting action to note, because Venmo reads similarly to social media, and would in this case act like a replacement application from their original Instagram or Twitter feed, for example.

Social media can be used as a means of distraction during in-person social interactions as well. Participant #10 stated that they "would normally be on my phone to avoid the awkwardness" of being in a shared public space with another person, yet were unable because of the study. On the other hand, participant #24 made the claim that "when I spent time with friends [during the study], I actually felt closer to them because I wasn't distracted." Participant #7 voiced that they rely on social media to "cheer [them] up," which can be interpreted as used as a distraction method from the things that are causing grief or stress in daily life. Instead of social media, they looked up animal images on the internet for a sense of joy, and played online games to fill the designated time as well.

### *Habit and Productivity*

There was a notable link between the participant's level of productivity and the impact of the lack of social media on daily routine. Participants #18 and #29 both expressed that the more downtime they had on any given day, the more difficult it was to refrain from using their cell phone. Similarly, there was a change throughout the week of people reporting that they felt more productive and engaged as the week went on and the separation from their social media solidified into a new routine or schedule without it.

A notable amount of people also communicated how near the beginning of the study, they found themselves opening their phone with no apparent reason other than

habit. Participant #12 claimed on days one and two, they were constantly looking on the home screen of their cell phone, where the social media applications were before they were deleted from the device for the study. Participant #16 stated that on the second day of the study, they didn't understand why they were still picking up their phone without a reason, nor any notifications prompted them to pick it up. Participant #15 reported similarly, feeling very disconnected and picking up their phone constantly, yet by days three and four they were picking up their phone significantly less. They both included the word "habit" to describe what they were experiencing by this, and both of them used the word "constantly" to explain their need to check for updates in the beginning days of the study. Something to note is that the included quotes above all are of participants that were a part of the second group, and spent the entire week without social media. They were much more descriptive about the impact over such a longer amount of time than Group #1, whose length of detachment was much less.

As participants began to break that habit, as mentioned by many the changes that occurred between days one and four, they self reported feeling more productive and "on task" by the end of the study (#29). A person from the one hour group, #19, claimed that the hour "wasn't a significant amount of time" each day, yet it forced them to be productive and accomplish an assignment or task. Participant #12 included in the post study that they had "broken the habit" of checking their social media constantly, "trending from thinking about it often to not at all by the end of the week." The decrease of the habit of using social media led to the increase of productivity and ability to focus on a specific action, whether that be socializing as mentioned in previous subheading, or a productive task such as school or work.

### *Connection vs. Separation*

An interesting thing to point out is the difference between the use of the terms "connected" and "disconnected" in reference to the ways in which this study affected the participants' social activities. This relates to the theme of anxiety as previously mentioned, in the ways that participants wrote about fears of being disconnected from the online world towards the beginning of the week.

As an example, participant #22 claimed on day two to be worried about feeling disconnected from their friends, since they wouldn't be seeing others' posts on social media and might miss something that a friend would post. This person also had a family member keep their "streaks" for them, a feature within Snapchat that keeps track of each day in a row that you send a photo or video to another person, so that they would not lose this connection. Later in the week, #22 noted that they felt extremely connected with family on the fifth day because of not having a reason to be on their phone during their time together. This contrasts the prior concern of the same participant, having been worried about disconnection from the lack of social media.

Participant #4 explained in the post study completed after the seven days that "disconnection is rejuvenating." When analyzing the language purposefully used, the word disconnection is often meant to imply a negative connotation, yet rejuvenating is a word along with others used by other participants like "refreshing," "relaxing," and "comforting," that imply positive emotions and sentiments that emerged during the detachment period. This contrasts with those who at the beginning of the week feared the forced disconnection that this study would cause them, yet uses the same wording.

Another example of these positive connotations is seen with participant #20 claiming that partaking in the present study felt like "not carrying a burden [of social

media] anymore, and participant 11 in explaining that "the authentic social connection and support I felt today [from peers] is better than anything I can get from Instagram."

### *Willingness of Future Detachment*

At the conclusion of the seven days of the study, included at the end of the journal packet was a "post study," for both groups (Appendix A and Appendix B.) A particular question was in regards to whether or not the participant would be willing to participate in a future detachment from social media, even if it was not as a part of a compensated study trial. Twenty-nine of the thirty participants (97%) indicated that they would willingly participate again in the removal of these social media applications, on their own accord. Many also expressed the benefits that were reaped from the weeklong trial, and gave information supporting why the detachment was important and why they would detach again at a later date.

Participant #20 continued the study by giving up their social media for the duration of the observance of Lent, while #17 also continued their detachment from social media longer than the structured length of the study. A participant who claimed that they would not willingly participate again indicated this was because of the fact that social media was a structured part of their daily routine, and did not see a reason to change it.

**Discussion**

**Differences Between Weeklong and One Hour Groups**

There are notable differences between the results of those who were asked to detach from their social media for an entire week, or those who were able to choose one hour each day to refrain from access. These differences are seen both in the quantification of their self recorded anxiety scale by day, but also in the qualitative responses.

Many of those in the week-long group expanded on the difficulty at the beginning of the week, in reference to how often they checked for notifications for no apparent reason. Many negative connotations were seen through their qualitative language, which then drastically contrasted towards the end of the week where participants felt overall more productive, focused, relaxed, and socially connected. Although this was also seen in the one-hour per day group, there was more variance in participants' responses, mainly focusing on how they chose to be productive during that specific hour. It was less of a lifestyle change, and more of an intentional time to accomplish a task or assignment, with less social implications attached. The one hour per day group also reported lower scores on average on the anxiety scale six out of the eight prompted times, so the correlation was stronger for the weeklong detachment of change over time. This trend falls in line with the breaking of any habit or addiction, supporting that completely detaching from the action may cause more stress but causes a more drastic change.

**Habit Forming Tendencies**

Many responses showed a change in need for social media throughout the week. Many participants explained that their need for using social media was great during the beginning of the week to pick up their phone for no reason, except to check for

notifications that they knew would not likely be present. When realizing they would have minimal notifications due to the lack of social media applications, this desire to check grew less and less as the study continued. This slowing rate of change in their desire demonstrates the solidified decision making capabilities that allow for the break from social media to occur.

The decrease of anxiety throughout the week illustrates the changes happening within habit creating behaviors. The "habit loop" (Duhigg, 2012) of social media use which pertains to the three part process of a trigger, an action, and a reward, had been altered from the study and detachment from it. Thus, there was no action to follow the trigger of simply having the cellular device present, because the social media was deleted from the device. That in turn was breaking this habit of engaging online, because no reward could come from a non-action to reinforce picking it up again. This loop gradually decreased throughout the week, as participants felt less and less of a need to check their phone for no reason. This played a role in the emotional state of many responders; several reported positive connotations by the end of the week regarding their experience.

**Recommendations**

The implications of significant social media use are unknown due to the recency of technology advancements in this regard. What is known is that, like any habit that inhibits productivity or is used as a distraction, it is important to break those automated tendencies at varying intervals so that it does not interfere with daily life, or things deemed as more of a priority. It would be wise to participate in self guided detachment periods from social media, in order to allow this habit loop of seeking a reward from online interactions and notifications to fade.

A simple yet practical way to break automated habits is to intentionally set aside a designated length of time away from social media, whether it be one hour before sleeping, one whole day per week, or one whole week every few months, as this study has shown. The intentionality of even one week with limited to no social media had effects on several participants, and aided in their productivity and overall contentment as a part of their takeaway. Many people within the cohort of 18-22 years old have three or more hours per day logged as their "screen time" on average. Over the next fifty years, if that duration is maintained, it totals over six years of looking directly at a cell phone. A break in this habit to reduce or minimize the time spent on social media could have beneficial effects that our modern society is unaware of yet.

Specifically the students at Malone University can benefit from decreased social media time by participating in an intentional spiritual practice. As being a student at Malone requires the attendance to a number of spiritual formation opportunities, a suggestion to the spiritual leaders would be to create an intentional practice of limiting cell phone or social media use, similar to honoring the Sabbath by refraining from work. Any group of students willing to partake and commit could be asked to choose a day of the week, perhaps Sunday, to withhold from all social media or online connections. This would take place in order to grow in an understanding of creation and engaging the world around them, encouraging mentally and physically healthy activities. Students could then come together once a week for a reflection and devotion time, to support one another in being present in the moment and active in the surrounding world.

**Future Research**

Suggestions for future research would include a similar study as the one presented here, with either a larger amount of participants for a variety of data

responses, or a study for an extended length of time. Per the previous suggestions on the maintenance of habit-reducing behaviors like one day detachment each week, one weekend each season, etc. it would be interesting to identify the effects of behavioral changes. An extended study that would follow participants through social media detachment periods over the course of six months to a year would shed light on complex patterns in emotional and behavioral responses. Taking the research in a different direction, it would be interesting to understand the personality components that affect a participants willingness to engage online, similar to the correlation between introversion, extroversion,  and social media presence (Wilson, Fornasier, & White; 2010).

Further discussion is to be had on the neurological and long term effects of social media in our modern American culture, and I am confident that more will come with time and experience in our quickly advancing world. Humans in modern culture are wirelessly held together, connected now more technologically than geographically. While social media and smartphone use is very newly charted territory, it opens up a vast amount of opportunity for understanding and research.

**References**

Aboul Ezz, H.S., Khadrawy, Y.A., Ahmed, N.A., Radwan, N.M., & El Bakry, M.M. (2013). The effect of pulsed electromagnetic radiation from mobile phone on the levels of monoamine neurotransmitters in four different areas of rat brain. *European Review for Medical and Pharmacological Sciences, 17* (13), 1782-8.

Adolphs, R. (2003). Cognitive neuroscience of human social behaviour. *Nature Reviews Neuroscience 4*, 165–178. https://www.nature.com/articles/nrn1056#citeas

Baumeister, R.F. and Leary, M.R. (1995) The need to belong: desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117* (3), 497-529.

Bernardi, S. and Pallanti, S. (2009) Internet addiction: A descriptive clinical study focusing on comorbidities and dissociative symptoms. *Comprehensive Psychiatry, 50* (6) 510-516.

Saal, D., Malenka, R.C. (2005). The role of synaptic plasticity in addiction. *Clinical Neuroscience Research*. 5 (2–4) 141-146. https://www.sciencedirect.com/science/article/pii/S1566277205000599 .

Meshi, D., Tamir, D., Heekeren, H.R. (2015). The emerging neuroscience of social media. *Trends in Cognitive Sciences, 19*(12), 771-782. https://www.sciencedirect.com/science/article/pii/S1364661315002284

Duhigg, C. NPR (2012, March 5). *Habits: how they form and how to break them.* National Public Radio. URL https://www.npr.org/2012/03/05/147192599/habits-how-they-form-and-how-to-break-them

Eijnden, R., Lemmens, J., Valkenburg, P. (2016). The social media disorder scale. *Computers in Human Behavior*, *61*, 478-487. www.sciencedirect.com/science/article/pii/S0747563216302059

Fareri, D.S and Delgato, M.R. (2014) Social rewards and social networks in the human brain, *Neuroscientist 20* (4), 387-402.

Hatch, J. A. (2002) Inductive analysis, *Doing Qualitative Research in Education Settings* (4), 150-179.

Hartley, S., & Haynes, T. (2018, May 1). Dopamine, smartphones & you: a battle for your time. *Science in the News*, Harvard University. http://sitn.hms.harvard.edu/flash/2018/dopamine-smartphones-battle-time/

Holst, A. (2019, Nov 11). Number of smartphone users worldwide 2014-2020. *Statista.* https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/ .

Hyman, S., Malenka, R. (2001). Addiction and the brain: The neurobiology of compulsion and its persistence. *Nature Reviews Neuroscience, 2*(10), 695–703.

Marcantonio M. Spada. (2014). An overview of problematic internet use. *Addictive Behaviors*, 39(1) 3-6.

"Mobile Phone Ownership..". (2019, Jun 12). Demographics of mobile device ownership and adoption in the United States. *Pew Research*. https://www.pewresearch.org/internet/fact-sheet/mobile/ .

Wilson, K., Fornasier, S., & White, K. M. (2010). Psychological predictors of young adults' use of social networking sites. *Cyberpsychology, Behavior, and Social Networking. 13*(2) 173-177. https://www.liebertpub.com/doi/abs/10.1089/cyber.2009.0094

## Appendix A

Social Media Study Instructions

**<u>Group #1:</u>**

Over the course of the next week, you will be asked to detach from your social media accounts, specifically Instagram, Facebook, Twitter, Tik Tok and Snapchat, for one hour of each day. This hour is of your choosing, yet it should not be during a time that you are otherwise occupied, i.e. during a class time, a work shift, etc. This should be your recreational time, where you choose to engage in some type of activity other than these four Social Media applications. Please note that you are still able to use any other cell phone functioning of your choice, we just ask that you refrain from these specific Social Media applications.

We ask that you be truthful in regards to your responses to this time, **even if you do choose to engage in social media during the specified hour**. The more honest your responses, the better data that can be gathered from this study.

Please, follow the attached journal and complete questions every day. You may print or type your responses.

**<u>Screentime Report:</u>**

Along with participating in this weeklong study, I am asking for a report of your average weekly "screen time", a relatively new feature presented within smartphones. Prior to beginning the study, please follow the instructions below and send via text or email.

The same will be asked of you two weeks following the conclusion of the study.

iPhone:

Please open your Settings application. Open the Screen Time tab, and then click "See All Activity". You will see a bar graph depiction of this week's collective activity. Scroll so you are seeing the **last full week of activity**. Then below the bar graph, select "show categories", choose social networking, and take a screenshot of your screen. Please email this to [oabrown1@malone.edu](mailto:oabrown1@malone.edu), or text to (330)-949-6382 with your name attached.

Android:

Please download the "Screen Time" application, and work through the required steps for the app to track your breakdown of phone usage.

Daily Journal Prompts: Group #1

Name:  _____        Date: _____

DAY ONE

- ❖ What time of day today did you separate from your social media? (e.g., 1-2 pm)

  Please record your response below.

- ❖ What did you do during this time instead of participating in these five social

  media? Please record your response below.

- ❖ If you decided to use your mobile device, which applications did you use during

  this time?

- ❖ On a scale of 0-10, 0 being not anxious at all and 10 being extremely anxious, how

  do you feel about the decrease of social media today?

  0        1        2        3        4        5        6        7        8        9        10

- ❖ Record the emotions you felt before, during, and after this scheduled time.

- ❖ Record any other thoughts or reflections

POST-STUDY

Please complete the following questions after you have completed the journals. Then you

may return your whole journal packet to Olivia as soon as possible.

a.  What did you notice about your time away from your social media?


b.  On a scale of 0-10, 0 being completely relaxed and 10 being completely anxious,

how do you feel about the decrease of social media at the conclusion of the week?


0      1      2      3      4      5      6      7      8      9      10


c.  Would you willingly participate in a similar break from your social media in the

future, even if it wasn't part of a study? Why?

**Appendix B**

Social Media Study Instructions

**Group #2:**

Over the course of the next week, you will be asked to detach from your social media accounts, specifically Instagram, Facebook, Twitter, Tik Tok and Snapchat, for the entirety of the week. Please note that you are still able to use any other cell phone functioning of your choice, we just ask that you refrain from these specific Social Media applications.

We ask that you be truthful in regards to your responses to this time, **even if you do choose to engage in social media during the week**. The more honest your responses, the better data that can be gathered from this study.

Please, follow the attached journal and complete questions every day. You may print or type your responses.

**Screentime Report:**

Along with participating in this weeklong study, I am asking for a report of your average weekly "screen time", a relatively new feature presented within smartphones. Prior to beginning the study, please follow the instructions below and send via text or email. The same will be asked of you two weeks following the conclusion of the study.

iPhone:

Please open your Settings application. Open the Screen Time tab, and then click "See All Activity". You will see a bar graph depiction of this week's collective activity. Scroll so you are seeing the **last full week of activity**. Then below the bar graph, select "show categories", choose social networking, and take a screenshot of your screen. Please email this to oabrown1@malone.edu, or text to (330)-949-6382 with your name attached.

Android:

Please download the "Screen Time" application, and work through the required steps for the app to track your breakdown of phone usage.

Daily Journal Prompts: Group #2

Name: _____     Date: _____

DAY ONE

- ❖ What did you do during the times you would usually be online, instead of participating in these five social media? Please record your response below.

- ❖ If you decided to use your mobile device, which applications did you use during this time?

- ❖ On a scale of 0-10, 0 being not anxious at all and 10 being extremely anxious, how do you feel about the decrease of social media today?

  0     1     2     3     4     5     6     7     8     9     10

- ❖ Record the emotions you felt before, during, and after this scheduled time.

- ❖ Record any other thoughts or reflections.

POST-STUDY

Please complete the following questions after you have completed the journals. Then you

may return your whole journal packet to Olivia as soon as possible.

    d.   What did you notice about your time away from your social media?

    e.   On a scale of 0-10, 0 being completely relaxed and 10 being completely anxious,

        how do you feel about the decrease of social media at the conclusion of the week?

        0     1     2     3     4     5     6     7     8     9     10

    f.   Would you willingly participate in a similar break from your social media in the

        future, even if it wasn't part of a study? Why?

**Appendix C**

<u>Social Media Study Survey</u> (*February, 2020*)

Please circle your response to the following questions:

**During the past year, have you...**

... often found it difficult not to look at messages on social media when you were doing something else (e.g. school work)?   Yes / No

... regularly found that you can't think of anything else but the moment that you will be able to use social media again?   Yes / No

... often sat waiting until something happens on social media again?   Yes / No

... felt the need to use social media more and more often?   Yes / No

... felt the need to check messages on social media more and more often?   Yes / No

... regularly felt dissatisfied because you wanted to spend more time on social media?
Yes / No

... often felt tense or restless if you weren't able to look at your messages on social media?
Yes / No

... regularly felt angry or frustrated if you weren't able to use social media?   Yes / No

... often felt bad when you could not use social media?   Yes / No

... tried to reduce your use of social media, but failed?   Yes / No

... tried to spend less time on social media, but failed?   Yes / No

... been unable to stop using social media, even though others told you that you really should?
  Yes / No

... regularly used social media to take your mind off your problems?   Yes / No

... often used social media to escape from negative feelings?   Yes / No

... often used social media so you didn't have to think about unpleasant things?   Yes / No

... often not paid attention at school, while doing homework or at work because you were using social media?   Yes / No

... regularly not had enough sleep because you were using social media too late at night? Yes / No

... regularly had arguments with others because of your social media use?   Yes / No

... regularly lied to your parents or friends about the amount of time you spend on social media?   Yes / No

... regularly hidden your social media use from others?   Yes / No

... often used social media secretly?   Yes / No

... regularly devoted no attention to people around you (e.g. family or friends) because you were using social media?   Yes / No

 ... regularly had no interest in hobbies or other activities because you would rather use social media?   Yes / No

 ... regularly neglected other activities (e.g. hobbies, sport) because you wanted to use social media? Yes / No

... had serious problems at school or at work because you were spending too much time on social media?   Yes / No

... had serious conflict with your parent(s) and sibling(s) because of your social media use? Yes / No

... jeopardised or lost an important friendship or relationship because you were spending too much time on social media?   Yes / No