SOCIAL MEDIA ADDICTION AND FEAR OF MISSING OUT:  THE MODERATING

EFFECT OF SMARTPHONE EASE OF ACCESS

by

Angela DaVina Seabrooks

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

School of Behavioral Sciences

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Abstract

The development of social media addiction has become a phenomenon creating a potential public health crisis. While research has found correlations between the development of social media addiction and rising levels of fear of missing out, there is limited research surrounding the influence of smartphone ease of access. This study examined the moderating effects of smartphone ease of access to social media platforms and assessed appropriate treatment interventions. This study used an experimental within-subject design with 641 participants, ages 19-32 years. Part I of this study measured the participants' levels of smartphone addiction, fear of missing out, and social media addiction at the initiation of the study. In Part II, 189 participants were asked to deactivate social media applications on their smartphones for two weeks and limit desktop usage to two days per week, no more than one hour each day. Variables were measured again at the conclusion of the two weeks. The results reflected that the relationship between fear of missing out and social media addiction was significantly moderated by smartphone addiction and revealed a significant difference in the mean scores for both instruments measuring fear of missing out, FOMO, and social media addiction, BSMAS.  The results revealed a slight increase in the mean scores for FOMO and BSMAS, which may indicate the need for a longer period of abstinence for smartphone social media use to reduce the levels of FOMO and BSMAS.

*Keywords:* Social, media, addiction, fear of missing out, smartphone, usage.

**Table of Contents**

**List of Tables**

## List of Figures

**List of Abbreviations**

Bergen Social Media Addiction Scale (BSMAS)

Fear of Missing Out Scale (FOMO)

Smartphone Addiction Scale – Short Version (SAS-SV)

**Chapter One: Introduction**

**Overview**

The research presented in this Introduction will provide an overview of the emotional and psychological challenges that have emerged with social media addictions and fear of missing out. The first section will outline the background surrounding problematic social media use, which has produced a variety of mental health concerns, such as depression and anxiety. This section will also discuss the impact of fear of missing out and the influence of ease of access to social media for those who have developed social media addictions. The next three sections will focus on the areas that may not have been adequately addressed by previous research, particularly surrounding the ease of access with smartphone applications and notifications. The discussion in these sections will examine the areas that require further study. These areas will be outlined in the purpose of the study, its significance, and in the research questions to be analyzed. Definitions will also be provided for the reader for terms that are deemed pertinent to the study.

**Background**

The use of social media as a means of communication has become an increasing phenomenon in modern society (Kircaburun, Demetrovics, & Tosuntaş, 2018). However, with the development of multiple platforms and the ease of access, there has been a rise in the problematic use, particularly when it becomes uncontrolled and compulsive (Kircaburun et al., 2018). Research has shown that two thirds of internet users, as well as more than one third of individuals in the world, are active on a social media platform (Kircaburun et al., 2018).

With the increased number of social media users reaching more than 2 billion worldwide, the World Health Organization voiced public health concerns as correlations were drawn with addictive behaviors for a minority of users (Hussain & Griffiths, 2018). Research emerged, initially examining the potential psychological and emotional impact of problematic use,

particularly focusing on teenagers, since they were found to be online almost constantly (Hussain & Griffiths, 2018). These studies also focused on the presence of comorbid psychiatric symptoms for the users who presented with problematic use, as well as an addiction (Hussain & Griffiths, 2018).

**Early Research / Internet Gaming**

As Bernardi and Pallanti (2009) discussed, initial studies analyzed data surrounding gambling and internet gaming addictions, with comorbid disorders and behaviors, particularly since they were more widely researched (Pontes, 2017). Many of the individuals with problematic internet use were found to be struggling with fatigue and challenges with sleep disturbances (Bener et al., 2018). These individuals also experienced higher levels of depressive symptoms and anxiety (Bener et al., 2018; Kim, LaRose, & Peng, 2009).

Research conducted by Bisen and Desphande (2018) also examined the positive and negative impacts of the internet, noting that individuals addicted to the internet endured strained interpersonal relationships, as well as anxiety and depression. These individuals were often isolated, as they spent less time with their friends and family members (Bisen & Deshpande, 2018). These individuals also experienced higher levels of loneliness, lower levels of self-esteem, and a decreased satisfaction with life, which were all found to be predictors of potential internet addiction (Bozoglan, Demirer, & Sahin, 2013; Kim et al., 2009). While gender was not found to be a predictor of problematic internet use, excessive use was found to be a predictor of future cigarette use and alcohol consumption (Bisen & Desphande, 2018). The studies revealed that individuals with problematic internet use consumed more alcohol than individuals who did not engage in problematic internet use (Bisen & Desphande, 2018).

**The Rise of Social Media**

While problematic internet use continued to grow, additional challenges emerged with the development of social media platforms and its increased use as a larger form of social communication (Andreassen et al., 2016). Social media was found to be useful for older adults to aid in reducing their isolation and loneliness (Chopik, 2016). However, early studies, which focused largely on Facebook usage, found that adolescents were more prone to experience depression and anxiety, particularly as cyber bullying emerged on these platforms (Jelenchick, Eickhoff, & Moreno, 2013). As Ko et al. (2014) discussed, early studies examined the increasing levels of hostility adolescents experienced, which may have originated with their internet addiction and became exacerbated with their problematic social media use.

In conjunction with this initial research focused on adolescents, additional studies emerged surrounding the impact of problematic internet and social media use for college students (Kittinger, Correia, & Irons, 2012). The studies initially focused on the moderating effect of Facebook usage on internet addictions, which revealed a positive correlation with the severity of the symptoms experienced by those with an internet addiction (Kittinger et al., 2012). Research also revealed the negative impact that problematic social media use had on the students' school performance and psychological well-being (Lee-Won, Herzog, & Park, 2015). Students were focused on receiving social assurance from the peers as they engaged and interacted on the Facebook platform (Lee-Won et al., 2015). This concern for acceptance and assurance produced a level of social anxiety among individuals with problematic social media use, particularly when the individuals received negative feedback surrounding their communication (Lee-Won et al., 2015).

As the number of social media platforms began to increase, research shifted to focus on the co-morbidity concerns, particularly surrounding the variety of mental health challenges caused by problematic social media use (Toseeb & Inkster, 2015). Individuals with problematic use were found to not only have symptoms of anxiety and depression, but were also experiencing low self-esteem, as well as suicidal ideations (Toseeb & Inkster, 2015). These symptoms were highly prevalent for children and adolescents with problematic use, along with a report of decreased life satisfaction for older adolescents and college students (Toseeb & Inkster, 2015). Individuals with problematic social media use were also found to experience a variety of levels of sleep disturbances and sleep deprivation, with cognitive impairment during the day, which are often symptoms associated with a substance use disorder (Xanidis & Brignell, 2016).

**Understanding the Symptoms of Addiction**

With this correlation to a traditional substance use disorder, the focus turned to understanding the addictive symptoms associated with problematic social media use, and factors contribution to the compulsive behavior (Xanidis & Brignell, 2016). Studies reviewed the impact of envy experienced by social media users, particularly when the information posted by their peers depicted a more enjoyable lifestyle than the lifestyle they were experiencing (Tandoc, Ferrucci, & Duffy, 2015). This focus has since transitioned to examining the fear of missing out experienced by those with problematic social media use, which has been identified as a contributing factor in the development of a social media addiction (Alt, 2018). Sparse research has emerged examining the correlation between social media addictions, fear of missing out, as well as smartphone use (Hunt, Marx, Lipson & Young, 2018). These studies have advanced existing research with the hopes of developing more preventive strategies to counteract the growing phenomenon of the social media addiction (Hunt et al., 2018).

**Problem Statement**

With the expansion of internet capabilities and the ability to connect with peers on multiple social media platforms, a variety of research studies have emerged examining the negative impact of excessive internet use and social networking (Andrea, 2015). These studies have identified multiple mental health and physical challenges that have developed with excessive use and have focused on cognitive challenges for children and adolescents who engage in problematic use (Andrea, 2015; Bibbey, Phillips, Ginty, & Carroll, 2015).   There is also a breadth of research surrounding the continued impact of problematic social media use when these individuals enter college and struggle academically and socially (Andrea, 2015). These individuals report greater levels of dissatisfaction with life, and higher levels of loneliness and low self-esteem (Andrea, 2015). These symptoms have been attributed to the evolution of the fear of missing out and envy reported by those with social media addictions (Andrea, 2015).

While these studies have provided a detailed review of the consequences of social media addictions, and outlined predictive indicators for problematic use, there is spare research surrounding the addictive behavior and the triggers for the compulsive use, particularly focusing on ease of access (Hunt et al., 2018).  Studies have shown a positive correlation between envy and fear of missing out with excessive use (Hunt et al., 2018). However, there has been a limitation in the focus on the causality, as opposed to identifying the correlation (Hunt et al., 2018). Studies have required abstention from social media for one week to determine if the individual would experience an improvement in well-begin (Hunt et al., 2018; Tromholt, 2016). The problem is that this timeframe does not address sustainability, and the study only focused on Facebook (Hunt et al., 2018; Tromholt, 2016). These studies also do not address the moderating impact of ease of access with smartphone applications (Hunt et al., 2018; Tromholt, 2016).

**Purpose Statement**

The purpose of this study was to examine the moderating impact of removal of smartphone ease of access on social media addiction and fear of missing out (Greenfield, 2018; Wolniewicz, Tiamiyu, Weeks, & Elhai, 2018). This study required individuals, ages 19-32, to deactivate their social media applications on their smartphones and limit their access to social media on desktops or laptops to two days per week, with no more than one hour of use each day, which simulated the detoxification timeframe typically used for individuals with a substance use disorder (Greenfield, 2018).  Individuals maintained this limited use for a two-week period and were evaluated at its conclusion (Hunt et al., 2018). The data was analyzed for the social media addiction, which is the predictor variable, for fear of missing out, which is the outcome variable, and their moderation by the smartphone ease of access.

**Significance of the Study**

With the increased mental health and physical concerns developing as a result of social media addictions, the research conducted in this study will provide support, and advancement for the treatment methods currently utilized (Greenfield, 2018). Since a social media addiction is not listed in the 5th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5), treatment has largely focused on cognitive behavioral therapy (CBT) interventions developed for an internet gaming addiction and gambling (American Psychiatric Association, 2013; Wölfling, Beutel, Dreier, & Müller, 2014; Young, 2011).  As Young (2011, 2013) discussed, a specialized form of CBT was designed, CBT-IA, which focuses on behavior modification surrounding compulsive use, cognitive distortions, and co-morbid issues that may arise. While effective for internet addiction, this treatment method needs to be expanded to address the neurobiological conditioning found with smartphone applications and alerts (Greenfield, 2018).

**Research Questions**

This study was designed to explore the following research questions:

**RQ1:** What is the moderating effect of smartphone addiction on the relationship between fear of missing and social media addiction for individuals age 19-32?

**RQ2:** Will removing access to social media platforms from smartphones impact social media addiction and fear of missing out?

**Definitions**

Terms pertinent to the study are defined below:

1. *Social Media Addiction* – A social media addiction is defined as individual's heightened concern with social media and preoccupation with freeing time in order to return to social media platforms (Andreassen, 2015). This preoccupation and excessive use results in an impairment of employment, or school responsibilities, social activities, and interpersonal relationships (Andreassen, 2015; Andreassen, Pallesen, & Griffiths, 2017).

2. *Fear of Missing Out* – Fear of missing out (FOMO) is defined as the emotional and psychological state an individual experiences when they develop anxiety surrounding their peers' social activity, which may present as more desirable (Buglass, Binder, Betts, & Underwood, 2017; Przybylski, Murayama, DeHaan, & Gladwell, 2013).

3. *Smartphone Addiction* – A smartphone addiction is defined as the level of usage that interferes with an individual's work or school responsibilities, interpersonal relationships, impacts them social, impacts their driving, as well as sleep patterns (Kwon, Kim, Cho, & Yang, 2013; Wolniewicz et al., 2018).

## Summary

With the rise in the number of social media platforms, and the growing number of individuals developing social media addictions due to fear of missing out, it is important to understand the moderating impact of ease of access to these platforms through smartphone applications (Greenfield, 2018; Wolniewicz et al., 2018). Various studies have examined the mental health and physical challenges that have emerged as a result of problematic social media use and the development of social media addictions (Kircaburun et al., 2018). While initial studies examined the rising symptoms of anxiety and depression, additional research has focused on social isolation, loneliness, as well as suicidal ideations, particularly among adolescents and college students (Andrea, 2015; Bibbey et al., 2015).

Recent studies have begun to move beyond the focus of the correlations between fear of missing out and the development of social media addictions, to understanding the potential causation of this phenomenon (Hunt et al., 2018). Studies have delved more deeply into the potential impact of terminating social media use and the potential impact on the user's well-being (Hunt et al., 2018). However, additional research is needed surrounding the impact of the ease of access to social media platforms through smartphone applications and the neurobiological conditioning that is created with the notifications and alerts (Greenfield, 2018; Hunt et al., 2018). This study examined the moderating impact of this smartphone ease of access to social media platforms in order to further explore its influence, which may aid in the development of more effective interventions for treatment (Greenfield, 2018; Hunt et al., 2018).

**Chapter Two: Literature Review**

**Overview**

The first section of this literature review will discuss the problematic internet use that has been documented for children and adolescents, as well as adults, which has transitioned to a social media addiction. Within this discussion, the review will examine the impact that problematic internet use, as well as problematic social media use, is having on individuals ages 19-32, who have the highest usage rate. The review will examine the challenges researchers have encountered with defining and identifying problematic social media use, which initially focused on a single social media platform. As multiple social media platforms emerged, screening tools have been modified to accommodate the growth. The review will also examine the impact of smartphone technology and the ability of social media users to have easy access to their platforms. With this ease of access, the final section of the review will also examine the increase in fear of missing out and will also discuss appropriate treatment interventions, which should focus on the characteristics of the addictive behavior often found with substance use disorders.

**Conceptual Framework**

The phenomenon of addictive social media use has sparked extensive research surrounding the social and interpersonal impact on families and relationships, as well as the psychological impact on the user's mental health (Jasso-Medrano & López-Rosales, 2018). This level of addictive use of social media has been viewed as a subtype of internet addiction (Jasso-Medrano & López-Rosales, 2018). However, as research has highlighted, there is an emergent focus on the predictive factors of social media addiction and the development of depression, anxiety, as well as suicidal ideations (Jasso-Medrano & López-Rosales, 2018). These may

include increased loneliness and isolation, as well as difficulty fulfilling work and school obligations (Jasso-Medrano & López-Rosales, 2018).

      **Biopsychosocial Model – Theoretical Framework**. With the increased mental health concerns, and debilitating impact that a social media addiction can have, the biopsychosocial model for behavioral addiction provides the framework for treatment for this growing challenge (Greenfield, 2018). The biopsychosocial model of illness was born out of George Engel's concern in 1977 that the biomedical model did not account for the social, psychological, as well as behavioral concerns that may contribute to illnesses (Wade & Halligan, 2017). The biopsychosocial model has been expanded and is widely used by professionals working with individuals with addictions, particularly since substance addictions are marked by neurological challenges (Clark & Goudriaan, 2018; Greenfield, 2018).

      The biopsychosocial model of addiction has provided guidance on more therapeutic interventions that may be needed for social media addictions that are closely correlated with a traditional substance used disorder (Greenfield, 2018). This study seeks to aid in understanding this correlation and the moderating impact of the ease of access through smartphone applications and the neurobiological conditioning it creates (Greenfield, 2018). This research may help develop more appropriate, and effective, treatment interventions (Greenfield, 2018).

<center>**Related Literature**</center>

      Research studies have focused heavily on this correlation between problematic internet use and the development of a social media addiction, particularly for individuals ages 19-32 who have the highest percentage of online activity (Odac & Kalkan, 2010). With the transition from high school to potential college enrollment, this is deemed a critical time for social and emotional development, as well as academic performance (Odac & Kalkan, 2010). As Odac and

Kalkan discussed (2010), these individuals who engage in problematic internet use often struggle with loneliness, self-esteem concerns and the need for approval and social acceptance from their peers.

Since studies have shown that internet use is highest among this age range, this group is deemed to be at risk for potential internet and social media addictions (Odac & Kalkan, 2010). While this demographic has the highest rate of usage, research conducted by Odac and Kalkan (2010) revealed that there are general differences among the genders for the purpose of usage. For example, females generally engage in internet activity to communicate with friends and family members within their interpersonal circle, as well as to meet new people (Odac & Kalkan, 2010). Whereas males generally use the internet for surfing or playing violent games (Odac & Kalkan, 2010).

With the rise in gaming activity, research surrounding problematic internet use studied correlations with excessive use and the compulsive behavior often found with an internet gaming disorder (Ryu et al., 2018; Tonioni et al., 2014). Since an internet addiction is not a disorder found within the 5th edition of the *Diagnostic Statistical Manual of Mental Disorders* (DSM-5), research has focused on the symptoms often associated with problematic internet use that mirror the addictive symptoms of a gaming disorder (Romano et al., 2017; Tang, Koh, & Gan, 2017). These include symptoms of impulsivity, particularly with the excessive hours spent using the internet (Tonioni et al., 2012; Tonioni et al., 2014).

Symptoms also involved the individual avoiding responsibilities as they carved out time to access the internet (Tonioni et al., 2012; Tonioni et al., 2014). These individuals with problematic internet use also experienced symptoms of socio-emotional impairment and the avoidance of interpersonal relationships, particularly as the excessive use increased (Tonioni, et

al., 2012). These individuals also experience the physical and psychological symptoms of withdrawal with the termination of an internet use session (Romano et al., 2017; Tang, Koh, & Gan, 2017).

**Examining Problematic Internet Use**

With this initial focus on problematic internet use, research also examined dysfunctional behaviors, as well as maladaptive thoughts and perspectives, to assess which personality traits may be predictive of problematic internet use (Durak & Senol-Durak, 2014). As Durkan and Senol-Durak (2014) discussed, studies revealed that abusive behaviors, narcissistic tendencies, and competitiveness were found to be moderators and mediators of problematic internet use. Studies also reflected that individuals with low self-esteem and low self-efficacy were also likely to engage in problematic internet use, as well as individuals who engaged in social isolation (Durak & Senol-Durak, 2014).

These individuals struggling with interpersonal relationships, low self-esteem, and difficulty with their social skills sought safety in communicating through the internet (Lee & Stapinski, 2012). With their research study, Lee, and Stapinski (2012) discovered that, for these individuals struggling with their social skills, online communication provided less of an opportunity for a potentially negative evaluation or possible rejection by their peers. Online communication also provided these individuals with more control over their personal presentation (Lee & Stapinski, 2012).

Research studies reflected that many individuals who developed problematic internet use, often began accessing the internet at approximately age 9 (Li, O'Brien, Snyder & Howard, 2015). These studies reflected that the overuse and misuse of the internet often developed around age 16 (Li et al., 2015). While boredom was commonly reported as a trigger for increased

internet use and access, the pervasiveness of the internet in various areas of life and the need to be connected increased the potential for problematic use and potential internet addiction (Li et al., 2015).

**Predictive Behaviors of Problematic Internet Use**

With a shift towards identifying common traits and characteristics, research was also conducted surrounding the potential disorders that may be predictive of problematic internet use (Evren, Evren, Dalbudak, Topcu, & Kutlu, 2018; Ho et al., 2014). Studies examined symptoms and features for those such as individuals diagnosed with attention deficit hyperactivity disorder (ADHD), as well as those who may struggle with their emotion regulation (Evren et al., 2018; Ho et al., 2014). As Evren et al. (2018) discovered, with the wealth of information to be accessed through the internet, their research revealed a positive correlation between individuals with an internet addiction, who were also diagnosed with ADHD and spent an excessive number of hours online.  Studies also reflected a positive correlation between those who struggled with emotion regulation and increased levels of problematic internet use, particularly when they engaged in social isolation (Evren et al., 2018).

With the rise in the rate of internet use, research has continued to focus on potential co-morbid disorders, which have revealed increasing levels of depression among individuals with problematic internet use as well as problematic social media use (Dieris-Hirche et al., 2017). However, studies continue to assess whether problematic internet use and depression are independent comorbidities or if problematic internet use is predictive of depression (Dieris-Hirche et al., 2017). This correlation formed the basis for much of the research that followed surrounding problematic social media use (Bányai et al., 2017).

**Defining Problematic Social Media Use**

One primary challenge with studying social media addiction is the lack of consensus surrounding the definition of problematic social media use (Bányai et al., 2017). In assessing potential symptoms for a definition, research studies have focused on the negative impact triggered by excessive use and its detrimental effects and impact on quality of life (Bányai et al., 2017; Longstreet & Brooks, 2017). For example, early studies focused on the correlation between loneliness and isolation and problematic social media use (Longstreet & Brooks, 2017; Reissmann, Hauser, Stollberg, Kaunzinger, & Lange, 2018). Loneliness was found to have both a moderating and moderating impact on social media use, and those with problematic social media use reported diminished enjoyment in their quality of life (Longstreet & Brooks, 2017; Reissmann et al., 2018).

Research reflected that humans possess an innate urge to engage in social connections, which is designed to meet both social and emotional needs (Reissmann et al., 2018; Turel & Serenko, 2012). These needs were traditionally fulfilled by physical social interactions that occurred within multiple domains such as the home, school, and community settings (Reissmann et al., 2018; Turel & Serenko, 2012). However, with the increase in social media use as a primary means of communication, this interaction is increasingly lacking, and enhancing the prevalence of loneliness and isolation (Reissmann et al., 2018; Turel & Serenko, 2012). As Reissmann et al. (2018) discussed, these individuals struggle with their interpersonal relationships and consistent social support systems  While social media has been helpful in aiding some individuals in reducing their social isolation, the excessive use, and substitution for offline connections and social interaction have proven detrimental (Reissmann et al., 2018; Turel & Serenko, 2012).

In determining a definition, studies have also focused on the lack of optimism often prevalent with individuals found to have a social networking addiction (Yu, Wu, & Pesigan, 2016). As Yu et al. (2016) discovered, individuals with an addiction to social networking often experience poor sleep performance, fatigue, as well as difficulties in their interpersonal relationships. When studying adolescents and college students, research reflected that these individuals also experienced academic challenges (Yu et al., 2016). The cumulative impact of these negative effects produced loneliness as well as a lack of optimism, which became predictive symptoms of problematic social media use and a potential social networking addiction (Yu et al., 2016).

**Impact on Adolescents**

When examining problematic social media use, many of the research studies centered largely around the prevalence of adolescent problematic use, particularly focusing on the impact on academic performance and the struggles adolescents face with developing their social skills (Bányai et al., 2017). As Bányai et al. (2017) discovered in their research, this population was a logical selection for early research since approximately 71% of teenagers have more than one social media account and approximately 24% of adolescents are constantly online. With the adolescent population, the focus was on possibly incorporating intervention programs within the school system for students who were identified as having a social media addiction (Bányai et al., 2017).

These students often experienced poor emotional and psychological functioning, as well as cognitive challenges due to their social media addictions (Bányai et al., 2017; Sampasa-Kanyinga, & Lewis, 2015). Research reflected that they struggled to fulfill their educational obligations as their preoccupation with accessing social media sites increased (Bányai et al.,

2017; Sampasa-Kanyinga, & Lewis, 2015). As these students struggled with poor academic

performance, developing prevention and intervention programs within the school presented as a

logical solution and a logical collaborative partner in developing effective treatment

interventions (Bányai et al., 2017; Sampasa-Kanyinga, & Lewis, 2015). The school was also

useful in creating intervention programs to counteract the concerns these students faced from

negative online peer interaction, which transitioned to cyberbullying (Bányai et al., 2017;

Sampasa-Kanyinga, & Lewis, 2015).

**Impact of Childhood Maltreatment**

Studies also examined the correlation between childhood maltreatment and the

development of problematic social media use (Worsley, McIntyre, Bentall, & Corcoran, 2018).

As Worsley et al. (2018) discovered, there is a moderating relationship between childhood

maltreatment and a social media addiction (Seung-Min, Park, Jung-Eun, Kim, & Nam-Shim,

2018). This is due in part to the presence of an avoidant attachment with the primary caregiver,

as well as the presence of symptoms of depression (Blackwell, Leaman, Tramposch, Osborne, &

Liss, 2017; Worsley et al., 2018).

As research has reflected, an avoidant attachment, which is considered an insecure

attachment style, typically results in the primary caregiver being emotionally unavailable for

their child (Blackwell et al., 2017; Worsley et al., 2018). Oftentimes the child's needs are

disregarded or ignored completely, which may result in the child caring for their own needs and

engaging in more isolating behavior for the child (Blackwell et al., 2017; Worsley et al., 2018).

These negative effects create a cognitive-affect vulnerability, which also makes the child or

adolescent highly prone and susceptible to problematic social media use (McCrae, Gettings, &

Purssell, 2017; Worsley et al., 2018).

As Demircioğlu, and Göncü Köse (2018) discussed, other insecure attachment styles, which may include the caregiver being ambivalent or disorganized, in correlation with narcissistic personalities and psychopathy, were also strong predictors of a social media addiction. These individuals are likely to struggle with the development of social skills and offline social engagement (Demircioğlu, & Göncü Köse, 2018). As research has shown, these traits were also predictors of relationship dissatisfaction, and the likelihood that the individual will seek social interaction online, as opposed to in person interaction (Demircioğlu, & Göncü Köse, 2018). All of which are also negatively associated with the development of a social media addiction (Demircioğlu, & Göncü Köse, 2018).

Research also focused on the correlation between adolescents who engaged in problematic social media use and links to peer aggression and peer victimization (Martínez-Ferrer, Moreno, & Musitu, 2018). Studies reflected a positive correlation established between problematic social media use and maladjustment behaviors as well as overt aggressive behaviors for both males and females (Martinez-Ferrer et al., 2018). As such, prevention programs began to focus on the evolution of these challenges with aggression, particularly with the increase in the occurrences of online bullying (Martinez-Ferrer et al., 2018).

**Impact on Adults**

As research revealed a stronger correlation between problematic social media use and symptoms of depression, studies also emerged which focused on the impact of problematic social media use on adults (Shensa, Sidani, Dew, Escobar-Viera, & Primack, 2018). Studies that focused on older adults reflected more positive effects and experiences with social media use, particularly for those who were challenged with limited social support systems (Nef, Ganea, Müri, & Mosimann, 2013). The use of social media provided more opportunities for these

individuals to engage within their communities (Nef et al., 2013; Oh, Ozkaya, & Larose, 2014). Social media was also helpful for older adults who may have struggled with mobility limitations (Nef et al., 2013; Oh et al., 2014).

**Younger and Middle-Aged Adults.** When viewing the impact of social media use on younger and middle-aged adults, studies reflected more mental health challenges with social media use, particularly surrounding symptoms of depression as well as anxiety (Nef et al., 2013; Shensa et al., 2018). In the research conducted by Shensa et al. (2018), the studies reflected that approximately 7% of the adult population is impacted by depression annually, and 18% of the population is affected by anxiety. When examining the correlation between these mental health disorders and problematic social media use, Shensa et al. (2018) discovered that, due to the multifaceted causes for depressions, the patterns of problematic use with adults needed to focus on patterns of use as opposed to the quantity of time used. As Shensa et al. (2018) discussed, the pattern of use is more likely to reveal indicators and predictors of excessive use, which may result in addictive behavior.

## Impact of Social Isolation

When viewing pattern of use and its correlation with depression, studies revealed that adults with problematic social media use were more withdrawn and used social media to counteract loneliness and feelings of low self-esteem (Wilson, Fornasier, & White, 2010). This focus on depression, which initially centered around internet addiction, also found that adults with problematic social media use experienced poor sleep patterns with their heightened symptoms of depression (Kim et al., 2017). These individuals were often more likely to be at risk for developing suicidal ideations and more likely to engage in suicidal behavior (Kim et al., 2017).

While the 5<sup>th</sup> edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-5) does not directly address social media addiction, studies have begun to focus on the individual symptoms presented within the depression and anxiety (Shensa et al., 2017). With adults, symptoms of depression often peak in adulthood, where individuals are likely to experience more difficulties with interpersonal relationships, thus creating the susceptibility to problematic social media use (Shensa et al., 2017). While the DSM-5 provides treatment guidelines for depression and anxiety, interventions for problematic social media use will have to address the symptoms of addiction found in the behavior since the DSM-5 does not address a social media addiction (Shensa et al., 2017).

## Measuring Social Media Addiction

With the development of instruments to measure social media addiction, the behavior had to be defined in order to be measured (Andreassen, 2015). The consistent components of the definitions for social media addictions focused on the individual's heightened concern with social media and being driven by a strong motivation to log on to, or use, social media (Andreassen, 2015). This drive and extensive use of social media resulted in the impairment of other social activities, employment, or school responsibilities, as well as interpersonal relationships (Andreassen, 2015).

As Andreassen (2015) discussed, individuals with a social media addiction are often preoccupied with ways in which they can free up time in order to return to social networking sites. They often prefer to use social media sites as their primary means of connecting socially (Andreassen, 2015). The early screening tools focused on the rise in the use of social media on platforms through means such as laptops and smartphones, and also focused on factors that

included neurobiological dispositional factors, sociocultural factors, as well as behavioral

reinforcement (Andreassen, 2015).

**Single Social Media Platform**

A variety of the initial research and measurement instruments, such as the Facebook

Dependence Questionnaire (FDQ) and the Bergen Facebook Addiction Scale (BFAS), focused

narrowly on Facebook addiction only, largely due to its popularity (Andreassen, 2015). Research

conducted by Fox and Moreland (2015) sought to examine the dark side of Facebook as its use

continued to expand. While there are multiple benefits of the platform, the dark side revealed

that Facebook users also experienced psychological stressors and social pressure with managing

the content, feeling tethered to the site, as well as various challenges faced with social

comparisons and jealousy (Fox & Moreland, 2015).

**Facebook Fatigue.** When examining the dark side of Facebook, studies have also

revealed that some users experience social media fatigue when they are bombarded by excessive

Facebook content (Bright, Kleiser, & Grau, 2015). The platform has continued to evolve over the

years as it tracks user activity and implements a variety of ways in which to keep the users

engaged (Bright et al., 2015). However, research reflected users developing a sense of feeling

overwhelmed by the increasing content and advertisements, as well as their need to monitor their

peers' posts and comments as soon as they receive alerts and notifications that new information

has been added (Bright et al., 2015).

With the development of this sense of social media fatigue, some users have felt the need

to temporarily disconnect from the platform (Bright et al., 2015). However, those with a social

media addiction are often compelled to remain connected to Facebook, particularly when they

experience increased concern and a heightened level of anxiety surrounding the potential activity

they may miss if they do not log on to the site (Błachnio & Przepiórka, 2018; Bright et al., 2015). This increased anxiety surrounding peer activity was the development of the struggle with envy of the perceived lifestyle of others and the fear of missing out, particularly when the lifestyles appeared more enjoyable than the user's lifestyle (Błachnio & Przepiórka, 2018; Bright et al., 2015).

**Impact of Facebook Use on College Students**

Additional studies that examined social media addiction surrounding Facebook found that the majority of the users were college students (Koc & Gulyagci, 2013). This population was the initial target for Facebook's development (Koc & Gulyagci, 2013). When studying the social media use of these students, as Koc and Gulyagci (2013) discovered, research also supported the definition and measurement of predictors of Facebook addiction, which centered around feeling compelled to set aside consistent time weekly to log on, social motivation, as well as symptoms of depression, anxiety, as well as insomnia.

With the research conducted, the Facebook addiction scores of these students were found to be positively correlated to more extroverted personalities and neuroticism, as well as disturbances in sleep and awake patterns (Koc & Gulyagci, 2013). Their scores were negatively correlated to conscientiousness, which is consistent with their inability to fulfill, or maintain, their academic or work performance, as well as family obligations (Koc & Gulyagci, 2013). While there were gender differences in the use of Facebook, the study found that neither gender, nor demographics, were found to be predictive factors of a potential Facebook addiction (Koc & Gulyagci, 2013).

With the increased popularity of Facebook, and the development of addictions to its platform, research continued to focus on the emotional and psychological challenges that were

emerging (Clayton, Osborne, Miller, & Oberle, 2013; Marino, Gini, Vieno, & Spada, 2018).

Students with Facebook addictions were struggling with poor academic performance,

particularly as they sought to remain connected on the platform throughout the day (Clayton et

al., 2013; Marino et al., 2018). While previous studies identified loneliness, as well as anxiety as

potential predictors of problematic Facebook use, research also focused on substance use as a

predictor of a potential Facebook Addiction (Clayton et al., 2013; Marino et al., 2018). Research

identified alcohol, as well as marijuana use as potential predictors of an emotional attachment to

Facebook (Clayton et al., 2013).

**Multiple Social Media Platforms**

With the emergence of multiple social media platforms, research began to focus on the

potential public health challenges that were evolving with problematic social media use,

particularly surrounding the impairment it created with individuals being able to fulfill work,

school, and family responsibilities (Griffiths, 2013).  As with Facebook, these emerging

platforms were, and continue to be, used predominantly for social connections with individuals

who hold similar interests and typically have previously established offline relationships

(Griffiths, 2013). For example, Instagram is another popular platform, and has proven to be one

of the fastest growing social media sites (Sheldon & Bryant, 2016). Instagram was initially

started as a mobile-only site and could only be accessed through a smartphone application

(Sheldon & Bryant, 2016). As Sheldon and Bryant (2016) discussed, the growth of this platform

gained popularity, and may have contributed to, the excessive smartphone usage and the

potential development of smartphone addictions.

**The Growth of Instagram**. The focus of Instagram is on sharing photographs and live-

streaming videos, which can be accessed and viewed by any individuals with an Instagram

account (Sheldon & Bryant, 2016). As Sheldon and Bryant (2016) discussed, Instagram is more predominantly used by females than males. When assessing personality traits of Instagram users, their research found traits of narcissism among many of its users (Sheldon & Bryant, 2016). Research has also found higher levels of envy and depression for individuals who engage in social comparisons of the photos and videos of strangers, particularly those of which they perceive to have a better life (de Vries, Möller, Wieringa, Eigenraam, & Hamelink, 2018; Sheldon & Bryant, 2016).

**The Rise of the Twitter Platform.** Twitter is another popular social media platform that has gain increasing visibility over the years (David et al., 2018). Unlike Instagram, which is driven by photographs and videos, Twitter is designed to be a text-based platform where individuals exchange information through text-based messages, initially limited to 140 characters, called tweets (David et al., 2018). Individuals with Twitter accounts have the ability to communicate directly with friends and family members, as well as celebrities and athletes, and any other organizations or individuals they may track (David et al., 2018). Twitter is also used by a variety of organizations to disseminate news and is heavily utilized in the sports arena (David et al., 2018).

**Impact of Negative Tweets**. With the growth and popularity of Twitter, studies emerged that examined the visceral nature of some of the exchanges, particularly when individuals were being critical of a sporting event (David et al., 2018). In examining the negative information disseminated, research focused on the motivation behind the communication and examined the mindset of the users, particularly surrounding their views on their quality of life (David et al., 2018; Yang & Srinivasan, 2016). Studies reflected that individuals with symptoms of depression,

as well as a negative view of their quality of life, often disseminated tweets that expressed more anger and aggression, as well as dissatisfaction (David et al., 2018; Yang & Srinivasan, 2016).

These individuals often do not contemplate the impact of their negative communication, which may result in increased symptoms of depression and anxiety for the recipient of the negative communication (David et al., 2018; Yang & Srinivasan, 2016). For example, when David et al. (2018) examined college athletes and their social media engagement, their research found that approximately 84% of student athletes, who are typically between the ages of 18-22, have Twitter accounts. While approximately 90% of these athletes reported tweeting daily, research reflected that approximately 17% reported receiving hateful, negative tweets from their fans, which resulted in increased symptoms of depression and anxiety surrounding their performance (David et al., 2018). As David et al. (2018) discussed, these athletes often lack the maturity level to emotional navigate these negative, and often personal, attacks and may develop additional emotional and psychological challenges as a result.

Research also reflected that individuals who have a negative view of their quality of life also post tweets that reflect more tones of depression and sadness (David et al., 2018; Yang & Srinivasan, 2016). These individuals may exhibit more symptoms of depression and anxiety and struggle with their self-esteem, which is manifested in their willingness to engage in personal attacks on others based on their feeling of anonymity (David et al., 2018). These individuals also post more tweets that reflect more thoughts of death (David et al., 2018; Yang & Srinivasan, 2016).

**Increased Options and Uncontrollable Use**

With multiple methods to connect with peers, studies reflected that individuals with problematic social media use developed an uncontrollable need to log on to at least one of their

social media platform throughout the day (Griffiths, 2013; Wegmann, Oberst, Stodt, & Brand, 2017).  Their use became excessive as individuals felt compelled to maintain a social media presence with daily posts and comments, and possibly compete with the posts of their peers (Griffiths, 2013; Wegmann et al., 2017). This was particularly important when they were envious of the lifestyles viewed or were seeking approval for their own material (Griffiths, 2013; Wegmann et al., 2017). This may have been exacerbated by the increased anxiety surrounding the feeling that they may have been missing out on information when they were not logged on to a platform (Griffiths, 2013; Wegmann et al., 2017).

**Diminished Social Skills**.

Studies have shown that individuals who engage in multiple social media platforms often rely heavily on technology for their social engagement and their peer interaction (Kuss & Griffiths, 2017). This may result in the limited development of their social skills, with the inability to engage in meaningful conversations (Kuss & Griffiths, 2017). These individuals may lack the socio-emotional skills needed to assess their communication and the potential impact it may have, particularly when engaging in critical, or negative conversations that may prove emotionally damaging (Kuss & Griffiths, 2017).

These limitations in social skills have been found to be contributing factors to the increased loneliness and depression previously studied (Kuss & Griffiths, 2017). These limitations are also additional factors that contribute to the decreased attention span that may be present for those who engage in excessive use (Kuss & Griffiths, 2017). These individuals may constantly transition between platforms, for multiple hours throughout the day, as they seek updates from their peers and reactions to their posts (Kuss & Griffiths, 2017).

**Modification of Instruments**

With the development of multiple social media platforms, instruments were modified to measure and address the growing demand for various forms of social media, and their potential for problematic, and addictive use (Andreassen, Pallesen, & Griffiths, 2017). For example, the Bergen Social Media Addiction Scale (BSMAS) was adapted from the Bergen Facebook Addiction Scale (BFAS), which was expanded to accommodate the additional social media formats (Andreassen et al., 2017). The instrument removed the term Facebook, which was replaced with social media, and added a definition that advised the participant that this included Facebook, Instagram, Twitter, and the like (Andreassen et al., 2017). The instrument uses a 5-point Likert scale for the questions and measures behavior that has occurred over the past year (Andreassen et al., 2017).

The BSMAS has its foundation in traditional addiction theory (Andreassen et al., 2017). Its measurements focus on the six basic addiction symptoms, which include salience, conflict, mood modification, withdrawal, tolerance, as well as relapse (Andreassen et al., 2017). These are all symptoms which correspond with the diagnostic criteria for addictions (Andreassen et al., 2017).

Salience is found in the individual's preoccupation with social media, with conflict occurring as the individual chooses to sacrifice other obligations for the sake of accessing social media, or cause harm in other areas of their life as a result of social media (Andreassen et al., 2017). Mood modification is observed as the individual uses social media to reduce negative feelings (Andreassen et al., 2017). This results in the experience of cravings and the need to increase the tolerance of social media use to achieve the same pleasure (Andreassen et al., 2017).

Relapse is found when the individual attempts, unsuccessfully, to control their amount of social media use (Andreassen et al., 2017).

## The Impact of Smartphone Technology

As studies continue to examine social media addiction and potential moderating factors, additional research has focused on the increase in smartphone usage and the potential correlation excessive use may have with the development of a social media addiction (Wolniewicz et al., 2018). Studies have found that individuals that engage in excessive smartphone use often experience higher levels of stress than those with minimal to moderate usage (Cho, Kim, & Park, 2017). With a rise in their stress levels, individuals often experience diminished self-control, which has been a moderating factor in their ability to control their smartphone usage (Cho et al., 2017).

These individuals may have limited natural support systems and may engage in cyberloafing through their smartphones as a coping mechanism for their stress (Cho et al., 2017; Gökçearslan, Uluyol, & Şahin, 2018). This occurs when individuals are compelled to access the internet through their smartphone instead of engaging in legitimate work or completing other responsibilities (Gökçearslan et al., 2018). Studies have shown that individuals that spend more time using their smartphones to access the internet, social networking sites, as well as games and entertainment were more likely to engage in excessive use and possibly develop a smartphone addiction (Jeong, Kim, Yum, & Hwang, 2016).

**Increase in Smartphone Ownership**.

When examining smartphone usage, studies have shown that there is an average of 43% of smartphone ownership worldwide, with approximately 72% of the ownership held in the United States (Wolniewicz et al., 2018). As Wolniewicsz et al. (2018) discussed, the rise in

ownership is due largely in part to the variety of activities that may be conducted with a smartphone, particularly with the creation of smartphone applications that allows a user to access information and accounts that previously required the use of a desktop or laptop. For example, smartphones may now be used not only for traditional telephone communication, but may also be used for social interaction, researching information, as well as relaxation and entertainment (Wolniewicsz et al., 2018). With this increase in smartphone technology and capabilities, a correlation has developed between problematic smartphone use and social media addiction (Wolniewicz et al., 2018).

**Defining Problematic Smartphone Usage**

Problematic smartphone usage has been defined as the level of usage that interferes with an individual's ability to maintain, or complete, work, school, or family responsibilities (Wolniewicz et al., 2018). It may also be a level of usage that interferes with interpersonal relationships or impacts them socially (Wolniewicz et al., 2018). Problematic smartphone usage has also been associated with physical health issues such as physical fatigue and inability to concentrate, as well as mental health concerns, such as depression and anxiety (Matar Boumosleh, & Jaalouk, 2017; Wolniewicz et al., 2018).

While the physical and mental health issues are prevalent, the increased use of smartphones is associated with the advantages of being able to use the technology for multiple purposes such as tracking information, social networking, as well as accessing online games and television shows (Wolniewicz et al., 2018). This has become increasing challenging with the development of online video streaming services (Hasan, Jha, & Liu, 2018). These streaming service providers have developed applications and recommender services to ensure ease of

access to their shows and a continuous flow of information regarding potential entertainment available that fits the user's profile (Hasan et al., 2018).

Studies have shown that problematic smartphone usage interferes with social interactions and is often disruptive for social gatherings (Alhassan et al., 2018). Problematic smartphone usage may also impact an individual's driving, and may also interfere with their sleep patterns, which is what leads to the fatigue experienced (Alhassan et al., 2018). As problematic smartphone usage transitions to addictive usage, research has also found a direct correlation between this level of addiction and increased symptoms of depression (Alhassan et al., 2018). With the increased usage of smartphones for entertainment, research began to focus on the correlation with social media addiction, particularly with the ease of access to social media platforms on the smartphone (Wolniewicz et al., 2018).

Addictive smartphone usage has also been correlated with compulsive behaviors as well as functional impairment (Boumosleh & Jaalouk, 2017). With these compulsive behaviors, similar to a substance use disorder, research has reflected the development of a tolerance level as use is increased, as well as withdrawal symptoms for users when access to the smartphone was limited (Boumosleh & Jaalouk, 2017). This compulsive behavior is primarily aligned with the use of the smartphones for entertainment as opposed to its intended use of making a phone call (Boumosleh & Jaalouk, 2017).

**Fear of Missing Out**

When assessing additional factors that may contribute to social media addiction, studies have not only examined the correlation with problematic smartphone usage but have also studied the impact of negative emotions and cognitions, such as increasing levels of fear of missing out (Buglass et al., 2017; Casale, Rugai, & Fioravanti, 2018). Fear of missing out has been defined

as the psychological state where an individual may become anxious when evaluating their peers'

social media activity, particularly if their lives are perceived to be more desirable (Buglass et al.

2017; Przybylski et al., 2013). This level of anxiety creates a desire to stay continuously

connected to what others are doing (Przybylski et al., 2013).

As an emerging phenomenon, research studies examining fear of missing out initially

focused on the impact on college students, particularly surrounding their excessive social media

use and poor academic performance (Alt, 2015; Przybylski et al., 2013). When researching the

college students referred to as millennials, with excessive social media use, they were found to

have difficulty with establishing offline interpersonal connections with their peers (Alt, 2015;

Przybylski et al., 2013). Research revealed a moderating relationship between their fear of

missing out and their use of social media to fill their emotional and psychological deficits (Alt,

2015; Przybylski et al., 2013). This increased fear of missing out resulted in their preoccupation

with their social media activity and the resulting deficiency in their attention to their academic

performance (Alt, 2015; Przybylski et al., 2013).

**Impact of Alerts and Notifications**

With this prevalence of fear of missing out, research studies shifted their focus to the

variety of platforms and their increasing use being accessed through smartphones (Przybylski et

al., 2013). Most social media platforms provide continuous notifications and alerts throughout

the day of new content posted, as well as daily deals and advertisements (Przybylski et al., 2013).

These platforms create access to real-time information, which may exacerbate the growing

challenges with excessive smartphone usage, particularly since these notifications are primarily

distributed through smartphones (Przybylski et al., 2013). For individuals seeking social

connectivity, they may be vulnerable to these types of platforms (Buglass et al., 2017; Przybylski et al., 2013).

This type of online vulnerability is found with this increase in access to social media, not only with the influx of notifications on the social media applications, digital devices such as smartphones, but also with mass emails that are generated throughout the day (Buglass et al., 2017; Przybylski et al., 2013). While online vulnerability does not automatically equate to psychological vulnerability, studies have shown that there is a significant correlation between online vulnerability and a user's psychological wellbeing (Buglass et al., 2017). This vulnerability may make the user susceptible to fear of missing out and fear of social ostracism if they are not actively engaged with their peers' social posts, or if they are not posting their own content (Buglass et al., 2017; Przybylski et al., 2013).

These increased levels of fear of missing out are often associated with decreased levels of life satisfaction and a generally negative mood (Buglass et al., 2017; Przybylski et al., 2013). Individuals that are tethered to social media platforms because of their fear of missing out may also remain connected to distract themselves from offline challenges and responsibilities as well as negative life experiences (Buglass et al., 2017; Przybylski et al., 2013). They may be seeking an outlet for their negative mindset and negative mood and engage in excessive social media use with their expectations of receiving online satisfactions (Buglass et al., 2017; Przybylski et al., 2013).

**Limited Social Support System**

As Liu and Ma (2018) discussed, fear of missing out may be prevalent when there is a lack of an offline social support system, which drives someone to seek online social engagement. The individuals may present the perception of a natural support system and strong interpersonal

relationships (Liu & Ma, 2018; McDougall et al., 2016). However, the reality of the lack of connections may result in increased levels of depression and isolation as these individuals seek to fill the void (Liu & Ma, 2018; McDougall et al., 2016).

If social media becomes the primary medium of support, individuals may engage in addictive social media usage while awaiting comments and feedback from posts they submit, which provides a source of validations (Liu & Ma, 2018; Przybylski et al., 2013). Thus, these individuals may develop fear of missing out as a result of this dependency (Liu & Ma, 2018). When seeking this validation, research has shown a strong correlation between fear of missing out and the need for social inclusion or concern for exclusion (Lai, Altavilla, Ronconi, & Aceto, 2016). This correlation is indicative of the individual's fundamental desire to belong and the desire to avoid the negative emotional impact of loneliness (Lai et al., 2016).

### The Correlation with a Substance Addiction

Since the DSM-5 does not specifically address social media addiction, research studies have correlated the addictive behavior found with problematic social media use with symptoms associated with internet and video game addiction, as well as substance use disorders (Greenfield, 2018; Turel, Brevers, & Bechara, 2018).  Research studies conducted by Greenfield (2018) on internet addiction, referred to as the digital drug, and online gaming evaluated the impact of the ease of access found with smartphone and tablet usage (Turel et al., 2018). Studies revealed that this ease of access creates a threshold reduction, which significantly impacts its addictiveness (Greenfield, 2018).

As Greenfield (2018) discussed, with the shortening of the time frame between an individual's internet, or social media usage, the more addictive the process will be for them. This is particularly prevalent as their tolerance levels increase and they experience shorter timeframes

between their substance ingestion, which is accessing a social media platform, and the reinforcement they receive, which is the satisfaction in reviewing their peers' posts or receiving comments on their own posts (Turel et al., 2018). These individuals may also experience time distortions as their use becomes excessive and they seek to carve out time to return to one of their platforms (Greenfield, 2018; Turel et al., 2018). As Greenfield (2018) notes, this is most likely due to the classical process of operant and conditioning found within the tolerance and extinction resistant traits of substance use addictions, as well as internet related addictions (Turel et al., 2018).

**Correlation of Addictive Behaviors**

With his research, Greenfield (2018) also examined the unusual overlap among internet addiction, substance addiction, as well as online gambling in order to understand common factors that may be contributing to the addictive behavior present with each. The correlations that were found suggested that there is a common neurobiological connection, which may involve an impairment in the reward system often found with these disorders (Greenfield, 2018; Jovic & Dindic, 2011). An additional neurological connection is found with the dopamine reinforcement and gratification seen with these disorders after the introduction of physiologic stimuli or the use of psychotropic drugs (Greenfield, 2018; Jovic & Dindic, 2011).

**Factors That Contribute to Compulsive Use**

When assessing the key factors that contribute to the compulsive use that creates an internet addiction, as well as a potential social media addiction, Greenfield (2018) identified six primary factors to be reviewed. These included disinhibition, ease of access, content stimulation, dissociation, the neurobiological activation of the rewards pathway, and the perception of anonymity (Greenfield, 2018). With disinhibition, Greenfield (2018) argued that the user is less

constrained, taking on an alter ego or persona. Greenfield (2018) argued that, because there is

less executive functioning in the orbitofrontal area of the brain, it appears that the inhibitory

capacity of the brain can be hijacked during online activity.

**Examining Ease of Access**. With the second factor, ease of access, research has shown

that this is a common factor found among all forms of addictions (Greenfield, 2018). With the

continuous enhancements in smartphone and laptop technology, individuals can have internet

access, as well as social media access, on a constant basis (Greenfield, 2018). Once the internet

is accessed, Greenfield (2018) argues that it creates a neurobiological trigger, activating the

mesolimbic brain pathways. Once activated, the stimulation of the neuropathways and behavior

pathways create a sensation of being on automatic pilot (Greenfield, 2018).

**Content Stimulation**. This sensation of being on automatic pilot is impacted by the third

factor which is content stimulation, and the internet's unique ability to deliver powerful,

stimulating content almost instantaneously (Greenfield, 2018). As Greenfield (2018) argues,

content accessed such as video games, pornography, shopping, gambling, as well as social

media, each have their own unique reinforcing properties. With this reinforcement and

stimulation, individuals may experience the fourth factor, which is dissociation, or time

distortion (Greenfield, 2018).

**Time Distortion and Neurobiological Activation**. As Greenfield (2018) argues, the

internet and the content consumed can alter the perception of time and can alter mood as well as

consciousness. This time distortion is often highlighted, and measured within instruments

assessing the presence of addictions, as individuals struggle with the negative impact of

problematic internet and social media use where they are unable to fulfill work and school

obligations (Brand, Young, & Laier, 2014; Greenfield, 2018). Within this consumption of

content, individuals experience the fifth factor of the neurobiological activation of the rewards system, which mirrors the mesolimbic reward system activated after consumption of psychoactive substances, or during the engagement of other active behaviors (Brand et al., 2014; Greenfield, 2018).

   **Perceived Anonymity**. Within these factors that contribute to compulsive use is also the sixth factor of perceived anonymity (Greenfield, 2018). Users often engage in activities such as texting, instant messaging, shopping, gambling, pornography use, as well as social media as if they are alone, or engaging in private communication (Greenfield, 2018). However, as Greenfield (2018) notes, the internet is most likely the least anonymous communication medium.

**Impact of Smartphone Notifications**

   An additional factor to consider when evaluating the development of compulsive use is the contribution made by the smartphone, and the introduction of the notification features on applications installed (Brand, Young, Laier, Wölfling, & Potenza, 2016; Greenfield, 2018). Individuals may constantly receive alerts, such as beeps or buzzing sounds, that indicate that information is waiting to be accessed (Brand et al., 2016; Greenfield, 2018). As Greenfield (2018) discussed, this creates a sense of anticipation for new information and an increase in dopamine, which Greenfield argues is analogous to someone pushing the handle on a slot machine.

   Greenfield also argues that the notifications and the ringing of the smartphone results in the release of cortisol, which he argues triggers a self-medicating need to interact with the phone (2018). If the information received is positive, or deemed to be pleasurable, this triggers a dopamine surge, which reinforces the behavior (Brand et al., 2016; Greenfield, 2018). This receipt of constant information may also contribute to the automatic pilot experience, where the

user is unconsciously awaiting the receipt of new information (Brand et al., 2016; Greenfield, 2018).

This may also contribute to the development of fear of missing out, and the health problems that may also be associated with excessive internet and smartphone use (Greenfield, 2018). Individuals may become more sedentary as they engage in more online activity and may also develop a lower attention span (Greenfield, 2018). Individuals may also develop stress from maintain a state of vigilance as they await the receipt of new information (Greenfield, 2018).

**Spiritual Impact**

With these potential mental and physical health challenges resulting from compulsive online use, and smartphone access, research has also examined the correlation between an individual's spiritual well-being and compulsive online use or social media addiction (Miller, Mundey, & Hill, 2013; Wood, Center, & Parenteau, 2016).  This correlation has been an increasing interest in research studies, particularly since one of the largest populations affected by social media addiction, which is the millennial generation, is consistently identifying as less religious (Miller et al., 2013; Wood et al., 2016). These individuals have identified as less religious for both overt religious activities as well as their private religious perspectives (Miller et al., 2013; Wood et al., 2016).

Studies have examined whether an individual's spiritual beliefs may serve as a moderating impact on compulsive online or social media use or may be used as an effective intervention for those suffering with addictive behaviors (Miller et al., 2013; Wood et al., 2016). Previous studies have found that individuals who frequently read the Bible are less likely to be engaged on social media platforms (Miller et al., 2013; Wood et al., 2016). Research also found that individuals with a strong sense of self-efficacy are also less likely to develop a social media

addiction, or to engage in compulsive online use (Miller et al., 2013; Wood et al., 2016). Wood et al. (2016) argued that individuals who heavily utilized social media and allowed it to shape their perspectives may experience a diluted sense of self-efficacy and be vulnerable to the development of a social media addiction. For those who have developed a social media addiction, studies have shown that their spirituality may aid in the reduction of their symptoms of depression and anxiety, which are often present with a social media addiction (Miller et al., 2013; Wood et al., 2016).

## Potential Treatment Interventions

For individuals who have developed a social media addiction, as with an internet addiction, there is a lack of consistency in the recommended treatment interventions to be used (Greenfield, 2018). This is largely due to the inconsistencies in defining a social media addiction, as well as the lack of inclusion in the DSM-5 (Greenfield, 2018). Treatment methods have modeled those often used for internet and video game addictions, as well as traditional substance addictions (Graham, 2014; Greenfield, 2018).

### Behavioral Modification

As with a traditional substance use disorder, it will be important for a therapist to ascertain the client's level of motivation for change (Greenfield, 2018). This will aid in determining the interventions to be utilized, particularly since clients will present at varying stages (Greenfield, 2018). For those seeking assistance, some studies have found success using Cognitive Behavioral Therapy (CBT) to aid the client in identifying their triggers for their compulsive behaviors (Greenfield, 2018). Research has also shown that narrative therapy has proven effective in helping individuals with addictions, such as a video game addiction,

transition their online skills and communication to offline social engagement (Graham, 2014; Greenfield, 2018).

**Trigger Identification**. With the identification of the triggers, the client can learn how to alter their negative thoughts and reinforcements, with the goal of achieving abstinence, or at least a significant reduction in their social media use (Deters & Mehl, 2013; Greenfield, 2018). Motivational interviewing has proven to be a successful tool in helping clients increase their desire for this level of reduction in their social media use (Greenfield, 2018). Research has also shown some success with pharmacotherapy in conjunction with psychotherapy (Greenfield, 2018).

**Abstaining from Social Media**

More recent studies have examined the potential impact of requiring individuals to fully abstain from social media use as a treatment method for their addiction (Deters & Mehl, 2013; Tromholt, 2016). Research has found a decrease in the levels of loneliness and depression as individuals limit their social media posts (Deters & Mehl, 2013). However, studies that have required individuals to completely abstain from all social media platforms have produced limited success, particularly since the expectation of an individual completely abstaining from social media is not sustainable (Tromholt, 2016). This study will focus on the additional research needed surrounding the limitation of access to social media through smartphone application deactivation and desktop access limitation to determine its effectiveness in moderating smartphone addiction (Hunt et al., 2018; Tromholt, 2016).

<div align="center">Summary</div>

As the number of social media platforms has increased, a variety of research studies have emerged to assess the growing phenomenon of a social media addiction (Jasso-Medrano &

López-Rosales, 2018). While there continues to be a lack of consensus in defining a social media addiction, there has been progress in the development of instruments, such as the BSMAS, to include multiple platforms and assess the increased levels of depression and anxiety often found with this level of problematic social media use (Bányai et al, 2107). These symptoms are often exacerbated by the ease of access found with the enhancements of laptop and smartphone technology (Greenfield, 2018). With this enhanced technology, considered a digital drug, and constant access to information through applications, individuals have developed an increase in problematic smartphone usage and a heightened state of arousal as they await the arrival of new data (Greenfield, 2018).

Studies have focused on the neurobiological effect created by this level of constant connectivity and its correlations to a substance use disorder (Greenfield, 2018). This level of vigilance has also created a fear of missing out, which occurs when individuals become anxious about social media activity for their friends as well as their personal posts (Buglass et al., 2017). When evaluating effective treatment methods for this social media addiction, there is a lack of consensus in the most effective methods (Greenfield, 2018). Studies have shown that treatment methods modeled after those used for a traditional substance use disorder, as well as an internet and video game addiction are most effective, which may include the use of CBT as well as narrative therapy (Greenfield, 2018). However, additional research is needed surrounding the moderating impact of the ease of access through smartphone applications and desktop limitations (Hunt et al., 2018; Tromholt, 2016).

## Research Questions

In evaluating the phenomenon of a social media addiction and fear of missing out, the research study conducted was designed to evaluate the following questions:

**RQ1:** What is the moderating effect of smartphone addiction on the relationship between fear of missing and social media addiction for individuals age 19-32?

**RQ2:** Will removing access to social media platforms from smartphones impact social media addiction and fear of missing out?

**Chapter Three: Methods**

**Overview**

This section details the methodology that was utilized to study the relationship between social media addiction and fear of missing out when ease of access to platforms found on smartphones is removed. This chapter will outline the research design, the research questions that were studied, as well as the recruitment of participants. This chapter will also provide an overview of the instruments that were used and the manner of dissemination within the procedure. The final section of this chapter will discuss the statistical methods that were used to analyze the data collected.

**Design**

Upon obtaining approval from the Institutional Review Board (IRB), an experimental within-subject, or repeated measures, design was used for this study. This was the most appropriate design, since each of the participants were evaluated on two separate occasions (Warner, 2012). The first evaluation occurred at the beginning of the study, before participants are asked to deactivate access to social media platforms on their smartphones, and limit desktop social media access to two days per week, no more than one hour each day, for two weeks. The second evaluation occurred at the conclusion of the two-week period.

**Research Questions**

With the increase in the number of individuals developing a social media addiction, studies have examined contributing factors such as the presence of fear of missing out (Greenfield, 2018). However, additional research is needed surrounding the impact of the ease of access found with problematic smartphones use (Greenfield, 2018). This study examined the moderating impact of smartphone ease of access on fear of missing out and social media addiction. This study explored the relationship between fear of missing out, social media

addiction, and smartphone addiction, and examined the impact when smartphone ease of access was removed. Research questions included:

**RQ1:** What is the moderating effect of smartphone addiction on the relationship between fear of missing and social media addiction for individuals age 19-32?

**RQ2:** Will removing access to social media platforms from smartphones impact social media addiction and fear of missing out?

## Hypotheses

The following are alternate hypotheses for this study:

$H_a1$: The relationship between social media addiction and fear of missing out will be moderated by smartphone addiction.

$H_a2$: Removing smartphone access to social media platforms will impact social media addiction scores.

$H_a3$: Removing smartphone access to social media platforms will impact fear of missing out scores.

## Participants and Setting

The participants for this study were drawn from a convenience sample of college undergraduate and graduate students recruited from a local university during the spring semester of the 2019 – 2020 school year, and an online crowdsourcing service, Amazon's Mechanical Turk (MTurk) (Peer, Vosgerau, & Acquisti, 2014).  The study was conducted in two parts. The study included 641 participants in Part I and 189 participants in Part II (Warner, 2012).

**Inclusion and Exclusion Criteria**. An initial assessment was provided for the potential participants to determine their eligibility and willingness to participate in the experiment. To be included in Part I, the participant had to be between the ages of 19-32 years old and had to be

active on at least one social media platform. The participant were also required to utilize a smartphone, with an active application for their social media platform. To be included in Part II, the participants had to complete Part I and be willing to adhere to the terms outlined in the procedures for Part II. Upon providing consent, the participants were advised that they may terminate participation at any time. The initial assessment contained demographic information, which required the self-reporting of the participant's age. Participants were advised of the time frame for the study, which included two consecutive weeks.

Participants were excluded from the study if they did not have a social media platform and did not utilize a smartphone. Participants were also excluded if they were unable to participate in the two consecutive weeks required for the study. Participants were also excluded from Part II if they elected not to continue.

**Sample Size**. The final number of participants recruited for Part I of this study was 641 individuals. A moderated multiple regression was used to analyze the data collected (Warner, 2012). For Part II of the study, 189 participants were recruited. A paired, or correlated, samples *t* test was used to analyze the data for Part II (Warner, 2012). According to Warner (2012), using eta squared ($\eta2$) a sample size of 34 participants is the required number for a medium effect size with statistical power of .80 at the .05 alpha level. Since the sample size was comprised of a convenience sample of college students, who may be undergraduate or graduate, it was likely comprised of a cross-section of the population between the ages 19-32 years (Warner, 2012). The initial assessment included questions to ascertain the participant's gender, educational level, as well as their range of household income. Each participant was subjected to the intervention. Thus, no group separation was required.

**Instrumentation**

**Bergen Social Media Addiction Scale (BSMAS) (Andreassen et al., 2017).** The

BSMAS is a modified version of the Bergen Facebook Addiction Scale (BFAS), which replaced

the word 'Facebook' with social media (Andreassen et al., 2017). The modification also defined

social media as 'Facebook, Instagram, Twitter, and the like' (Andreassen et al., 2017).

Permission will be obtained to use the BSMAS. The BSMAS is a self-administered questionnaire

used to measure the six core features of addiction, which include salience, mood, modification,

tolerance, withdrawal, conflict, and relapse (Andreassen et al., 2017). The BSMAS has been

cited by multiple studies since its modification (e.g. Bányai et al., 2017). The BSMAS consists of

six items that are rated on a 5-point Likert scale, which include: 1 = Very rarely, 2 = Rarely, 3 =

Sometimes, 4 = Often, and 5 = Very often (Andreassen et al., 2017). The possible combined

scores for the BSMAS may range from 6 – 30, with 6 representing no social media addiction and

a score of 30 representing greater social media addiction (Andreassen et al., 2017). The BSMAS

has shown high internal consistency with Cronbach's alpha = 0.88 (Andreassen et al., 2017;

Bányai et al., 2017 ).

**Fear of Missing Out Scale (FOMO) (Przybylski et al., 2013)**. The FOMO is a self-

administered questionnaire used to measure the fear and anxieties individuals may have

regarding being excluded from, or out of touch with, the events and conversations occurring

within their social environment (Przybylski et al., 2013). The FOMO has been cited by multiple

studies since its creation by Przybylski et al. (2013) (e.g. Alt, 2015; Lai, et al., 2016). Permission

will be obtained to use the FOMO. The FOMO consists of 10 items that are rated on a 5-point

Likert scale, which include: 1 = Not at all true of me, 2 = Slightly true of me, 3 = Moderately

true of me, 4 = Very true of me, and 5 = Extremely true of me (Przybylski et al., 2013). The

combined possible scores for the FOMO may range from 10 – 50, with 10 representing no fear of

missing out and a score of 50 representing a high presence of fear of missing out (Przybylski et

al., 2013). The FOMO has shown reliable internal consistency with Cronbach's alpha = 0.87

(Przybylski et al., 2013).

**Smartphone Addiction Scale Short Version (SAS-SV)**. **(Kwon et al., 2013).** The SAS-

SV is a self-administered questionnaire used to measure symptoms of addiction from smartphone

usage that includes craving, withdrawal, tolerance, daily-life disturbance, and preference of

cyberspace-oriented relationship (Kwon et al., 2013). The SAS-SV is modified from the

Smartphone Addiction Scale and has been cited by multiple studies since its development (Kwon

et al., 2013) (e.g. Wolniewicz et al., 2018). Permission will be obtained to use the SAS-SV. The

SAS-SV consists of 10 items that are rated on a 6-point Likert scale, which ranges from: 1 =

Strongly disagree, to 6 = Strongly agree (Kwon et al., 2013). The combined possible scores for

the SAS-SV may range from 10 – 60, with 10 representing no presence of a smartphone

addiction and a score of 60 representing a high presence of a smartphone addiction (Kwon et al.,

2013). The SAS-SV has shown reliable internal consistency with Cronbach's alpha = 0.91

(Kwon et al., 2013).

## Procedures

Upon obtaining approval from the Institutional Review Board (IRB), Protocol #

4063.012220 (See Appendix E), participants were drawn from a convenience sample of college

undergraduates and graduate students recruited from a local university, and MTurk, during the

spring semester of the 2019 – 2020.  Participants were advised of the inclusion requirements and

the time frame through the emailed recruitment advertisement. Participants were required to be

within the ages of 19-32 years old, have a minimum of one social media platform, and must

utilize a smartphone. Consent to participate in the study was obtained at the point in which the participant completed the initial electronic demographic survey.

The consent form was the initial document provided to the participant, which provided background information on the study and outlined the procedures, which were all be completed online (See Appendix E). The consent form also outlined any potential risks involved in the study, as well as benefits the participants received. The consent form outlined compensation, provided in the form of a raffle, that was provided at the conclusion of the study. Participants were also informed that their information shall be kept confidential and maintained on a secured computer. They were advised that the researcher and faculty Chair shall be the only individuals that will have access to the information, which shall be destroyed after the three-year record retention requirement. The consent forms also provided contact information for the researcher and discussed the voluntary nature of the study and how participants may terminate their participation at any time.

**Initial Assessment**.

After electronically submitting the consent form, participants were asked to complete an initial survey, which included demographic questions regarding their age, gender, educational level, as well as income level. The initial assessment also determined whether the primary method in which the participants access social media is through their smartphone or using a computer. The initial assessment informed the participants that, they may terminate participation at any point within the study.

**Part I - Establishing a Baseline**. Upon selection of the participants, and completion of the initial assessment, the participants were asked to complete the BSMAS, FOMO, and the SAS-SV. This provided a baseline score for each participant. Participants were not provided

compensation for Part I of the study. However, they were advised of the potential compensation for Part II.

**Part II – Intervention**. At the conclusion of the survey for Part I, participants were then invited to participate in Part II of the study, which required the electronic submission of a second consent form, containing the same data outlined above. Participants were asked to take a screenshot of their smartphone battery usage, which displayed the percentage of time used for their social media applications. The participants were advised of the timeframe for Part II, which required two consecutive weeks. Participants were also advised that, upon completion of the study, they would be entered in a raffle, where they would have the opportunity to win one of three prizes, of $100.00, $150.00, or $250.00.

For participants who elected to continue, they were asked to deactivate the social media applications on their smartphones and were asked to limit their social media use on other devices, such as laptops and desktops, to two days per week, and no more than one hour of use during both days.  The time frame for the removal of the digital stimuli was selected based upon the correlation with a substance use disorder and the process of detoxification (Greenfield, 2018). The participants were asked to provide a screenshot of their battery usage on their smartphone which was to be taken each week, which would identify the applications they were currently using, and would provide verification that they were complying with the study protocol.  At the conclusion of the two-week interval, the participants received a survey, which re-administered the BSMAS, FOMO, and SAS-SV.

## Data Analysis

**Identifying the Variables**. For this study, three variables were explored to determine their correlations and moderating relationships. For Part I of the study, fear of missing out,

scored with the FOMO was the predictor variable, with the prevalence of a social media addiction, scored with the BSMAS, serving as the outcome variable. The relationship with social media addiction and fear of missing out was moderated by the third variable, which is the ease of access to social media platforms associated with problematic smartphone use, scored with the SAS-SV. For Part II of the study, SAS-SV was the independent variable, with FOMO and BSMAS serving as dependent variables.

**Statistical Analysis**. The SPSS 24 for Windows was used for all statistical analysis of the data collected (Warner, 2012). Data screening was conducted to determine the normality in the distribution using histograms, and boxplots were used to ascertain any outliers (Warner, 2012). When exploring the relationships between variables, the introduction of a moderating variable can change the understanding of the nature and strength of the relationship in various ways (Warner, 2012). A preliminary exploratory analysis was used to aid in statistically controlling for the moderating variable (Warner, 2012). For the data collected in Part I of the study, a moderated multiple regression was conducted (Warner, 2012).

**Internal and External Validity**. As a predictive analysis, the moderated multiple regression is designed to model the relationship between the predictor variable and the outcome variable, moderated by a third variable (Warner, 2012). The moderated multiple regression allows a researcher to fit a single line through a scatter plot, which are multi-dimensional data points (Warner, 2012). With the analysis of the correlations and directionality of the data, after fitting the line, the model may be used to identify the strength of the moderating variable on the predictor and outcome variables, as well as forecast change and predict future trends (Warner, 2012).  A hierarchical moderated multiple regression can also be used, where the predictors are entered sequentially to test the interactions between variables (Warner, 2012). In this study, the

moderated multiple regression was used to determine if the removal of the smartphone ease of access to social media would decrease social media addictions for those with fear of missing out.

A paired, or correlated, samples *t* test was also conducted to assess whether there was a statistical significance in the correlation of the group means for fear of missing out, and a social media addiction, when ease of access through smartphone usage was removed.  The strength of the correlations was assessed using eta squared ($\eta$2), medium effect size with statistical power of .80, ($\alpha$ = .05) (Warren, 2012). This provided greater internal validity and aided in preventing a potential Type II error, where a researcher may fail to reject a null hypothesis when the null hypothesis is actually false (Warren, 2012). External validity was also provided with the use of the sample of college students, both undergraduate and graduate, of all ages, and sexes, with no prior history or relationship with the researcher.

**Assumptions.** For the regression analysis conducted, the assumptions for a moderated multiple linear regression included a linear relationship, as well as multivariate normal distribution for the entire set of variables (Warner, 2012). The assumptions also included linear relations between scores on Y and scores on each X variable, as well as between each pair of X predictor variables, which should reflect no multicollinearity (Warner, 2012). The assumptions also included homoscedasticity (Warner, 2012).

For the paired samples *t* test, the assumptions included quantitative and approximately normally distributed scores on the outcome variable (Warner, 2012). Scores on the repeated measures variable should have had a multivariate normal distribution (Warner, 2012). The observations should be independent of one another, with no outliers on the dependent variable (Warner, 2012). There was an assumption of homogeneity of the variances and an assumption of equality for covariances (Warner, 2012).

**Chapter Four: Findings**

**Overview**

This section details the results of the study conducted evaluating the relationship between social media addiction and fear of missing out when smartphone ease of access to platforms is removed. The study was designed to test the following hypotheses:

**H$_a$1:** The relationship between social media addiction and fear of missing out will be moderated by smartphone addiction.

**H$_a$2:** Removing smartphone access to social media platforms will impact social media addiction scores.

**H$_a$3:** Removing smartphone access to social media platforms will impact fear of missing out scores.

This chapter will outline the descriptive statistics for 641 participants who completed Part I, and 189 participants who completed Part II of the study. The results will include data screening, with histograms and boxplots, to determine the normality in the distribution. This chapter will also outline the results of the moderated multiple linear regression conducted for 641 participants who completed the survey for Part I, and will also outline the results of a paired, or correlated, samples *t* test conducted for 189 participants who completed the survey for Part II (Warner, 2012).

**Descriptive Statistics**

**Part I – Demographics and Distributions**

For Part I of the study, a convenience sample consisting of 641 participants was recruited from a pool of undergraduate and graduate students and an online crowdsourcing service, Amazon's Mechanical Turk (MTurk). The participants were comprised of 274 females and 367

males, with a median age range between 25-32 years of age. When determining the primary

method for accessing social media, 79% of the participants utilized their smartphones to access

their social media platforms. Additional demographic information is provided in Table 1. With

preliminary data screening, histograms indicated that the scores for the participants' responses

were approximately normally distributed within each group. See Figure 1 – Figure 3.

**Table 1**

*Part I - Descriptive Statistics.*

| Current College Enrollment Status | | | | |
|---|---|---|---|---|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid Freshman | 26 | 4.1 | 4.1 | 4.1 |
| Sophomore | 57 | 8.9 | 8.9 | 12.9 |
| Junior | 56 | 8.7 | 8.7 | 21.7 |
| Senior | 100 | 15.6 | 15.6 | 37.3 |
| Graduate | 402 | 62.7 | 62.7 | 100.0 |
| Total | 641 | 100.0 | 100.0 | |

| Status as a Student | | | | |
|---|---|---|---|---|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid Residential Student | 395 | 61.6 | 61.6 | 61.6 |
| Online Student | 246 | 38.4 | 38.4 | 100.0 |
| Total | 641 | 100.0 | 100.0 | |

| Household Income | | | | |
|---|---|---|---|---|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid $0 - $25,999.99 | 178 | 27.8 | 27.8 | 27.8 |
| $26,000.00 - $49,999.99 | 223 | 34.8 | 34.8 | 62.6 |
| $50,000.00 - $74,999.99 | 146 | 22.8 | 22.8 | 85.3 |
| $75,000.00 or more | 94 | 14.7 | 14.7 | 100.0 |
| Total | 641 | 100.0 | 100.0 | |

| Ethnic Origin | | | | |
|---|---|---|---|---|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid Black / African American | 40 | 6.2 | 6.2 | 6.2 |
| Asian | 235 | 36.7 | 36.7 | 42.9 |
| Caucasian | 267 | 41.7 | 41.7 | 84.6 |
| Hawaiian / Pacific Islander | 3 | .5 | .5 | 85.0 |
| Hispanic / Latino | 38 | 5.9 | 5.9 | 91.0 |
| Indian / Alaskan | 39 | 6.1 | 6.1 | 97.0 |
| Other | 19 | 3.0 | 3.0 | 100.0 |
| Total | 641 | 100.0 | 100.0 | |

**Figure 1**

*Part I - Histogram of FOMO*
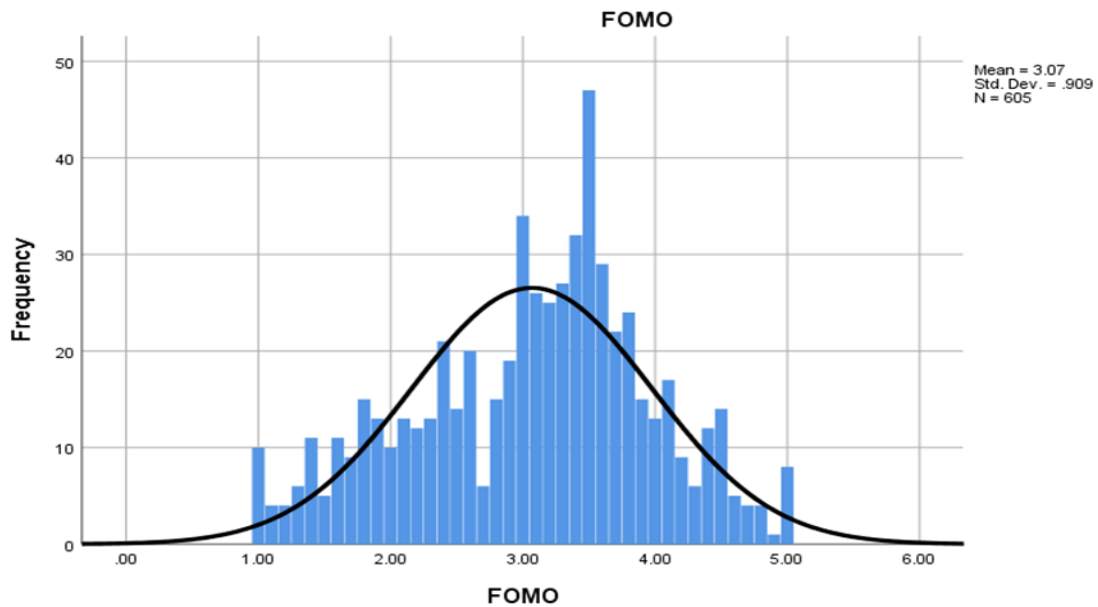
**Figure 2**

*Part I - Histogram of BSMAS*
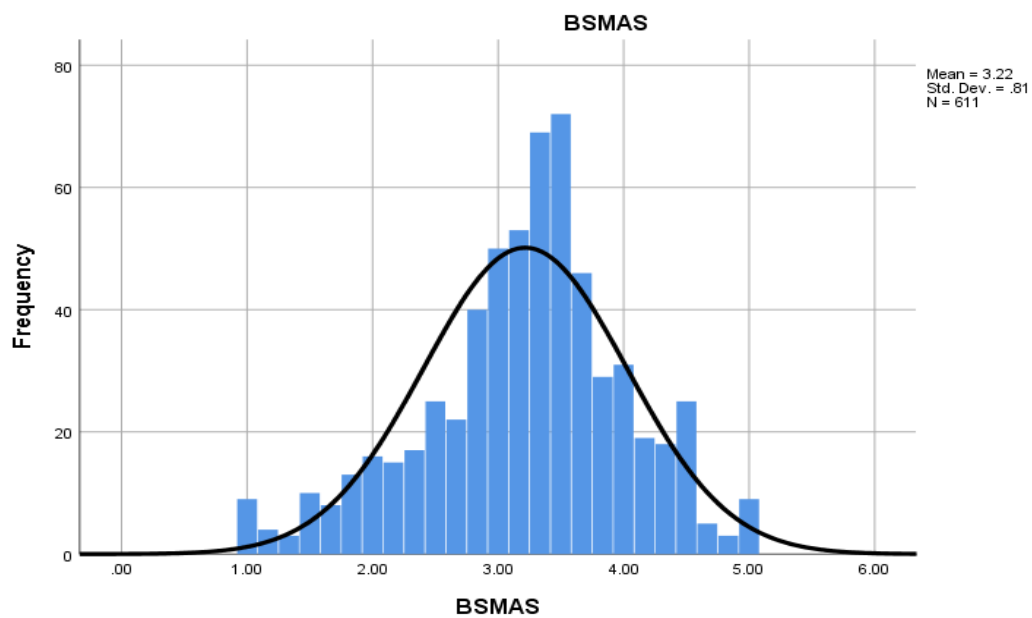


**Figure 3**

*Part I - Histogram of SAS-SV*
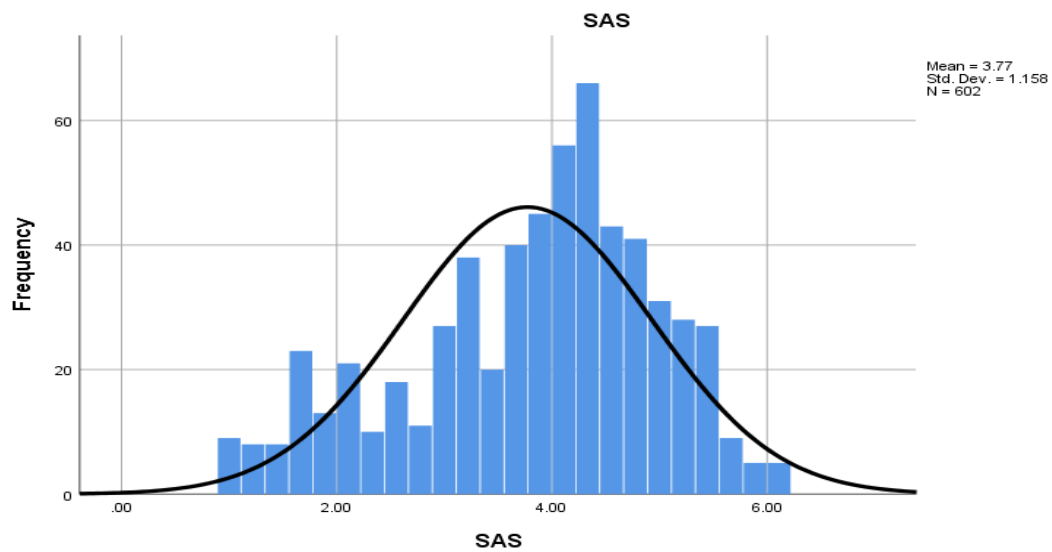
**Part II – Demographics and Distributions**

For Part II of the study the sample consisted of 189 participants who were recruited from the convenience sample of undergraduate and graduate students, as well as MTurk. The participants were comprised of 67 females and 122 males, with a median age range between 25-32 years of age. When assessing the primary method of accessing social media platforms, 59% of the participants for Part II utilized their smartphones to access their social media platforms. Additional demographic data for Part II is provided in Table 2. With preliminary data screening, histograms indicated that the scores for the participants' responses were approximately normally distributed within each group. See Figure 4 – Figure 6.

**Table 2**

*Part II - Descriptive Statistics.*

| Current College Enrollment Status | | | | |
|---|---|---|---|---|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid Freshman | 19 | 10.1 | 10.1 | 10.1 |
| Sophomore | 21 | 11.1 | 11.1 | 21.2 |
| Junior | 21 | 11.1 | 11.1 | 32.3 |
| Senior | 36 | 19.0 | 19.0 | 51.3 |
| Graduate | 92 | 48.7 | 48.7 | 100.0 |
| Total | 189 | 100.0 | 100.0 | |

| Status as a Student | | | | |
|---|---|---|---|---|
| | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid Residential Student | 132 | 69.8 | 69.8 | 69.8 |
| Online Student | 57 | 30.2 | 30.2 | 100.0 |
| Total | 189 | 100.0 | 100.0 | |

| Household Income | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | $0 - $25,999.99 | 50 | 26.5 | 26.5 | 26.5 |
| | $26,000.00 - $49,999.99 | 81 | 42.9 | 42.9 | 69.3 |
| | $50,000.00 - $74,999.99 | 50 | 26.5 | 26.5 | 95.8 |
| | $75,000.00 or more | 8 | 4.2 | 4.2 | 100.0 |
| | Total | 189 | 100.0 | 100.0 | |

| Ethnic Origin | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Black / African American | 9 | 4.8 | 4.8 | 4.8 |
| | Asian | 122 | 64.6 | 64.6 | 69.3 |
| | Caucasian | 42 | 22.2 | 22.2 | 91.5 |
| | Hawaiian / Pacific Islander | 1 | .5 | .5 | 92.1 |
| | Hispanic / Latino | 8 | 4.2 | 4.2 | 96.3 |
| | Indian / Alaskan | 7 | 3.7 | 3.7 | 100.0 |
| | Total | 189 | 100.0 | 100.0 | |

**Figure 4**

*Part II – Histogram of FOMO*



Mean = 3.77
Std. Dev. = .79
N = 184
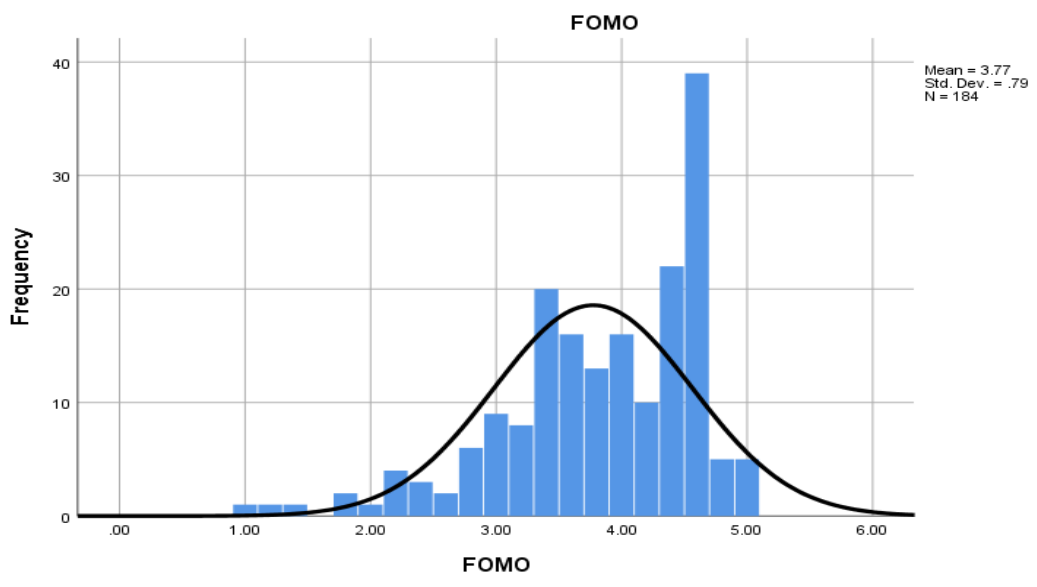
**Figure 5**

*Part II – Histogram of BSMAS*
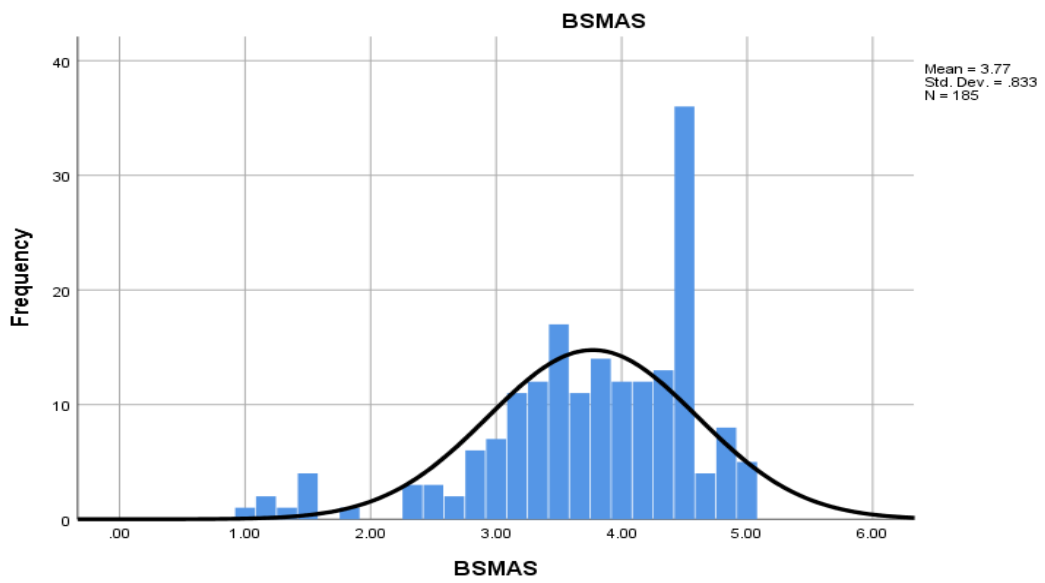


**Figure 6**

*Part II – Histogram of SAS*

**Comparison of Sub-Group Means**

**Part I – Gender**

In assessing the difference in the mean scores of males and females for the BSMAS, FOMO, AND SAS-SV, an independent samples $t$ test was conducted for Part I and Part II. For Part I, the assumption of homogeneity of variance was assessed by the Levene's test, $F = .174$, $p = .677$ (BSMAS); $F = .005$, $p = .945$ (FOMO); and $F = .006$, $p = .938$ (SAS-SV). This indicated no significant violation of the equal variance assumption (Warner, 2012). Thus, the equal variance $t$ test was used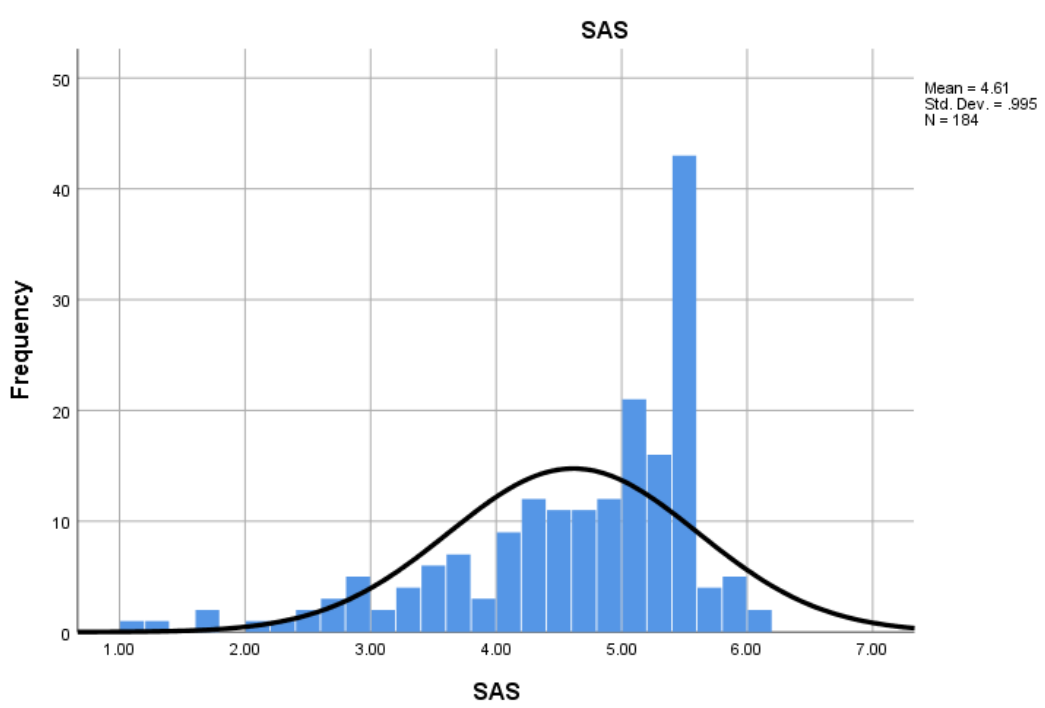 and was statistically significant for BSMAS, $t(600) = -2.440$, $p = .015$, two-tailed (Warner, 2012). However, the equal variance $t$ test was not statistically significant for FOMO, $t(600) = .296$, $p = .767$, two-tailed, and SAS-SV, $t(600) = -.473$, $p = .637$. The effect size, calculated using Cohen's $d$, was .202 for BSMAS, thus while the difference was significant, the effect size was small.

**Table 3**

*Part I - Independent Samples t Test – Mean Differences for Gender*

**Group Statistics**

| | Please indicate your gender. | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| BSMAS | Male | 349 | 3.1485 | .81864 | .04382 |
| | Female | 253 | 3.3103 | .78062 | .04908 |
| FOMO | Male | 349 | 3.0771 | .90063 | .04821 |
| | Female | 253 | 3.0549 | .91375 | .05745 |
| SAS | Male | 349 | 3.7470 | 1.17809 | .06306 |
| | Female | 253 | 3.7925 | 1.14770 | .07216 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| BSMAS | Equal variances assumed | .174 | .677 | -2.440 | 600 | .015 | -.16176 | .06629 | -.29196 | -.03156 |
| | Equal variances not assumed | | | -2.459 | 557.425 | .014 | -.16176 | .06579 | -.29099 | -.03252 |
| FOMO | Equal variances assumed | .005 | .945 | .296 | 600 | .767 | .02214 | .07482 | -.12481 | .16908 |
| | Equal variances not assumed | | | .295 | 538.520 | .768 | .02214 | .07500 | -.12518 | .16946 |
| SAS | Equal variances assumed | .006 | .938 | -.473 | 600 | .637 | -.04550 | .09623 | -.23449 | .14349 |
| | Equal variances not assumed | | | -.475 | 551.145 | .635 | -.04550 | .09583 | -.23373 | .14274 |

**Part II - Gender**

For Part II, the assumption of homogeneity of variance was assessed by the Levene's test, $F =$ 1.206, $p = .274$ (BSMAS); $F = 1.427$, $p = ..234$ (FOMO); and $F = 2.208$, $p = .139$ (SAS-SV). This indicated no significant violation of the equal variance assumption (Warner, 2012). Thus the equal variance $t$ test was used and was not statistically significant for BSMAS, $t(182) =$ 1.797, $p = .074$, two-tailed, FOMO, $t(182) = 1.393$, $p = .165$, two-tailed, or SAS-SV, $t(182) =$ 1.030, $p = .304$.

**Table 4**

*Part II - Independent Samples t Test – Mean Differences for Gender*

## Group Statistics

| | Please indicate your gender. | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| BSMAS2 | Male | 118 | 3.8531 | .78179 | .07197 |
| | Female | 66 | 3.6237 | .91114 | .11215 |
| FOMO2 | Male | 118 | 3.8339 | .75075 | .06911 |
| | Female | 66 | 3.6652 | .85187 | .10486 |
| SAS2 | Male | 118 | 4.6712 | .93481 | .08606 |
| | Female | 66 | 4.5136 | 1.09445 | .13472 |

### Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| BSMAS2 | Equal variances assumed | 1.206 | .274 | 1.797 | 182 | .074 | .22937 | .12762 | -.02244 | .48118 |
| | Equal variances not assumed | | | 1.721 | 118.400 | .088 | .22937 | .13326 | -.03451 | .49325 |
| FOMO2 | Equal variances assumed | 1.427 | .234 | 1.393 | 182 | .165 | .16875 | .12118 | -.07034 | .40784 |
| | Equal variances not assumed | | | 1.344 | 121.049 | .182 | .16875 | .12559 | -.07988 | .41738 |
| SAS2 | Equal variances assumed | 2.208 | .139 | 1.030 | 182 | .304 | .15755 | .15290 | -.14414 | .45924 |
| | Equal variances not assumed | | | .986 | 117.958 | .326 | .15755 | .15986 | -.15901 | .47411 |

**Part I – Undergraduate / Graduate**

In assessing the difference in the mean scores of undergraduate and graduate students for the BSMAS, FOMO, AND SAS-SV, an independent samples *t* test was conducted for Part I and Part II. A cut point was utilized to group undergraduate students, values 1-4 represented 1 = freshman, 2 = sophomore, 3 = junior, 4 = senior, and 5 = graduate students. The assumption of homogeneity of variance was assessed by the Levene's test, $F = .403$, $p = .526$ (BSMAS); $F = 1.932$, $p = .165$ (FOMO); and $F = 2.041$, $p = .154$ (SAS-SV). This indicated no significant violation of the equal variance assumption (Warner, 2012). Thus, the equal variance *t* test was used and was not statistically significant for BSMAS, $t(600) = -1.127$, $p = .260$, two-tailed. for FOMO, $t(600) = -.530$, $p = .596$, two-tailed, and SAS-SV, $t(600) = .604$, $p = .546$.

**Table 5**

*Part I - Independent Samples t Test – Undergraduate vs. Graduate*

**Group Statistics**

| | Please indicate your current college enrollment status. | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| BSMAS | >= 4.00 | 474 | 3.1973 | .81387 | .03738 |
| | < 4.00 | 128 | 3.2878 | .77604 | .06859 |
| FOMO | >= 4.00 | 474 | 3.0576 | .88480 | .04064 |
| | < 4.00 | 128 | 3.1055 | .98103 | .08671 |
| SAS | >= 4.00 | 474 | 3.7810 | 1.14054 | .05239 |
| | < 4.00 | 128 | 3.7109 | 1.25317 | .11077 |

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| BSMAS | Equal variances assumed | .403 | .526 | -1.127 | 600 | .260 | -.09050 | .08029 | -.24818 | .06717 |
| | Equal variances not assumed | | | -1.159 | 208.701 | .248 | -.09050 | .07812 | -.24450 | .06350 |
| FOMO | Equal variances assumed | 1.932 | .165 | -.530 | 600 | .596 | -.04787 | .09025 | -.22512 | .12937 |
| | Equal variances not assumed | | | -.500 | 186.507 | .618 | -.04787 | .09576 | -.23679 | .14104 |
| SAS | Equal variances assumed | 2.041 | .154 | .604 | 600 | .546 | .07008 | .11607 | -.15789 | .29804 |
| | Equal variances not assumed | | | .572 | 187.649 | .568 | .07008 | .12253 | -.17164 | .31179 |

**Part II – Undergraduate / Graduate**

For Part II, the assumption of homogeneity of variance was assessed by the Levene's test, $F =$ 2.170, $p = .142$ (BSMAS); $F = 1.773$, $p = .185$ (FOMO); and $F = .029$, $p = .865$ (SAS-SV). This indicated no significant violation of the equal variance assumption (Warner, 2012). Thus, the equal variance $t$ test was used and was not statistically significant for BSMAS, $t(182) = .316$, $p = .753$, two-tailed, and SAS-SV, $t(182) = -1.151$, $p = .251$. However, the equal variance t test was statistically significant for FOMO, $t(182) = -2.207$, $p = .029$, two-tailed. The effect size, calculated using Cohen's $d$, was .354 for FOMO.

**Table 6**

*Part II - Independent Samples t Test – Undergraduate vs. Graduate*

### Group Statistics

| | Please indicate your current college enrollment status. | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| BSMAS2 | >= 4.00 | 123 | 3.7846 | .75589 | .06816 |
| | < 4.00 | 61 | 3.7432 | .98252 | .12580 |
| FOMO2 | >= 4.00 | 123 | 3.6837 | .81687 | .07365 |
| | < 4.00 | 61 | 3.9541 | .70630 | .09043 |
| SAS2 | >= 4.00 | 123 | 4.5553 | .97797 | .08818 |
| | < 4.00 | 61 | 4.7344 | 1.02598 | .13136 |

### Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| BSMAS2 | Equal variances assumed | 2.170 | .142 | .316 | 182 | .753 | .04138 | .13114 | -.21736 | .30013 |
| | Equal variances not assumed | | | .289 | 96.313 | .773 | .04138 | .14308 | -.24261 | .32537 |
| FOMO2 | Equal variances assumed | 1.773 | .185 | -2.207 | 182 | .029 | -.27036 | .12248 | -.51203 | -.02869 |
| | Equal variances not assumed | | | -2.318 | 136.472 | .022 | -.27036 | .11663 | -.50100 | -.03972 |
| SAS2 | Equal variances assumed | .029 | .865 | -1.151 | 182 | .251 | -.17914 | .15567 | -.48629 | .12801 |
| | Equal variances not assumed | | | -1.132 | 114.793 | .260 | -.17914 | .15822 | -.49254 | .13426 |

**Results**

**Hypotheses**

**Part I:  H$_a$1 / Assumption Tests**

To test the first hypothesis, a moderated multiple linear regression (Warner, 2012) was

conducted to assess whether the relationship between social media addiction and fear of missing

out would be moderated by smartphone addiction. Preliminary data screening was conducted for

the responses from the predictor variable, FOMO, the outcome variable, BSMAS, which were

moderated by SAS-SV. Histograms indicated that the scores were approximately normally

distributed within each group. See Figure 1 – Figure 3.

The assumption of homogeneity of variance for each variable was assessed using the

Levene's test, $F = .660$,  $p = .417$ (BSMAS); $F = .016$, $p = .901$ (FOMO); and $F = 2.616$, $p =$

.106 (SAS-SV). This indicated no significant violation of the equal variance assumption

(Warner, 2012). Approximately 6.1 % (N=39) of the respondents had incomplete data. However,

the remaining sample size of  602 was sufficient to proceed. Thus, listwise deletion was utilized

for the incomplete responses (Warner, 2012). Internal consistency was high for all variables,

reflecting Cronbach's α = .92 for FOMO, Cronbach's α = .82 for BSMAS, and Cronbach's α = .92

for SAS-SV.

**Moderated Multiple Linear Regression.** The overall regression was statistically

significant, $R = .756$, $R^2 = .572$, adjusted $R^2 = .570$, $F(2, 599) = 399,993$, $p <.001$. There were

also significant effects for SAS-SV, $b = .294$, $t(599) = 10.518$, $p < .001$, and for FOMO, $b =$

.341, $t(599) = 9,469$, p $< .001$. See Table 3. The effect size, calculated using Cohen's $d$,  was

.572, and the 95% CI for the difference between sample means ranged from .239 to .349 for

SAS-SV, and .270 to .412 for FOMO. Since the interaction with the dependent variable,

BSMAS, was found to be statistically significant, the interaction was retained in the model and the null hypothesis was rejected. The results reflected that the relationship between social media addiction and fear of missing out is moderated by smartphone addiction. See Figure 7.

**Table 7**

*Part I – Levene's Test for Equality of Variances*

### Independent Samples Test

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | 95% Confidence Interval of the Difference | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | Lower | Upper |
| BSMAS | Equal variances assumed | .660 | .417 | -1.692 | 600 | .091 | -.13898 | .08212 | -.30026 | .02230 |
| | Equal variances not assumed | | | -1.588 | 170.094 | .114 | -.13898 | .08750 | -.31171 | .03375 |
| FOMO | Equal variances assumed | .016 | .901 | -2.486 | 600 | .013 | -.22863 | .09198 | -.40928 | -.04799 |
| | Equal variances not assumed | | | -2.406 | 175.943 | .017 | -.22863 | .09503 | -.41617 | -.04110 |
| SAS | Equal variances assumed | 2.616 | .106 | -1.277 | 600 | .202 | -.15161 | .11876 | -.38484 | .08162 |
| | Equal variances not assumed | | | -1.180 | 167.425 | .240 | -.15161 | .12849 | -.40527 | .10205 |

**Table 8**

*Moderated Multiple Linear Regression -Model Summary*

### Model Summary [b]

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|---|---|---|---|---|
| 1 | .756[a] | .572 | .570 | .52841 |

a Predictors: (Constant), FOMO, SAS

b Dependent Variable: BSMAS

**Table 9**

*Moderated Multiple Linear Regression -ANOVA*

ANOVA [a]

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 223.367 | 2 | 111.684 | 399.993 | .000 [b] |
| | Residual | 167.249 | 599 | .279 | | |
| | Total | 390.616 | 601 | | | |

a. Dependent Variable: BSMAS

b. Predictors: (Constant), SAS, FOMO

**Table 10**

*Moderated Multiple Linear Regression - Coefficients*

Coefficients [a]

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | | 95.0% Confidence Interval for B | |
|---|---|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. | Lower Bound | Upper Bound |
| 1 | (Constant) | 1.062 | .079 | | 13.373 | .000 | .906 | 1.218 |
| | FOMO | .341 | .036 | .383 | 9.469 | .000 | .270 | .412 |
| | SAS | .294 | .028 | .425 | 10.518 | .000 | .239 | .349 |

a Dependent Variable: BSMAS

**Figure 7**

*Normal P-P Plot of Moderated Multiple Linear Regression*



Normal P-P Plot of Regression Standardized Residual
Dependent Variable: BSMAS
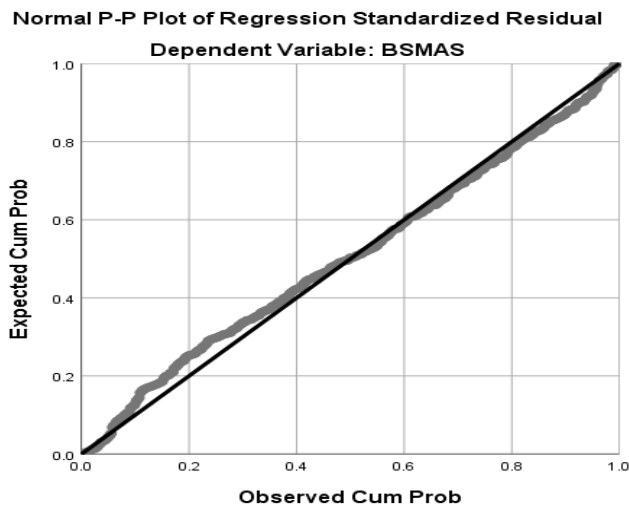
**Part II: H$_a$2 and H$_a$3 / Assumption Tests**

To test the second and third hypotheses, a paired samples *t* test was conducted to assess whether removing smartphone access to social media platforms would impact social media addiction scores, and whether removing smartphone access to social media platforms would impact fear of missing out scores (Warner, 2012). Preliminary data screening was conducted for the responses from the dependent variables, FOMO and BSMAS, and the independent variable SAS-SV. Although the histograms indicated bimodal distribution for the variables, the distribution provided a strong approximation to a normal distribution, allowing the paired samples *t* test to proceed. See Figure 4 – Figure 6. Approximately 9.5% (N = 18) of respondents had incomplete data. However, the sample size of 171 was sufficient to proceed. Thus, listwise deletion was also utilized for the incomplete responses for Part II (Warner, 2012). Internal consistency was high for all variables, reflecting Cronbach's α = .91 for FOMO, Cronbach's α = .86 for BSMAS, and Cronbach's α = .93 for SAS-SV.

**Paired Samples *t* Test**. There was a statistically significant difference in the scores for

FOMO, outlined in Table 7, before the removal of smartphone ease of access ($M$ = 3.1363, $SD$ =

.89277) and after the removal ($M$ = 3.8088, $SD$ = .78417); $t$(170 ) = 7.359, $p$ < .001.  There was

also a statistically significant difference in the scores for BSMAS before the removal of

smartphone ease of access ($M$ = 3.1832, $SD$ = .83718) and after the removal ($M$ = 3.8002, $SD$ =

.83345); $t$(170 ) = 6.600, $p$ = < .001.  The effect size for BSMAS, as indexed by eta squared ($\eta$2)

was .20, and the effect size for FOMO was .24 (Warren, 2012). The null hypothesis was rejected

for H$_a$2 and H$_a$3, reflecting that the removal of smartphone ease of access to social media impacts

social media addiction scores as well as scores for fear of missing out.

The paired samples *t* test was used to primarily assess the mean differences of the

dependent variables. However, the SAS-SV was also included in the test to determine if there

was a statistically significant difference in the means scores before the activation of the protocol

of removing smartphone access and after the two-week period concluded. The results reflected

that there was a statistically significant difference before the removal of smartphone ease of

access ($M$ = 3.7778, $SD$ = 1.15243) and after the removal ($M$ = 4.6450, $SD$ = .99742); $t$(170 ) =

7.558, p < .001.

**Instrument Scoring**. The instrument for FOMO contained 10 questions, using a Likert

scale for the responses ranging from 1-5, with possible scores ranging from 10 - 50. The

instrument for BSMAS contained 6 questions, using a Likert scale for the responses ranging

from 1-5, with possible scores ranging from 6 - 30. Whereas the SAS-SV contained 10 questions,

using a Likert scale for the responses ranging from 1-6, with possible scores ranging from 10-60.

See Appendices A- C.

**Table 11**

*Paired Samples t Test  - Statistics*

Paired Samples Statistics

|  |  | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| Pair 1 | BSMAS2 | 3.8002 | 171 | .83345 | .06374 |
|  | BSMAS | 3.1832 | 171 | .83718 | .06402 |
| Pair 2 | FOMO 2 | 3.8088 | 171 | .78417 | .05997 |
|  | FOMO | 3.1363 | 171 | .89277 | .06827 |
| Pair 3 | SAS2 | 4.6450 | 171 | .99742 | .07627 |
|  | SAS | 3.7778 | 171 | 1.15243 | .08813 |

**Table 12**

*Paired Samples t Test - Correlations*

Paired Samples Correlations

|  |  | N | Correlation | Sig. |
|---|---|---|---|---|
| Pair 1 | BSMAS2 & BSMAS | 171 | -.071 | .357 |
| Pair 2 | FOMO2 & FOMO | 171 | -.012 | .881 |
| Pair 3 | SAS2 & SAS | 171 | .031 | .687 |

*Note:* The negative correlation represents a reversal in the directionality of the effect, which was an increase in the mean scores instead of a decrease.

**Table  13**

*Paired Samples t Test – Paired Differences*

Paired Differences

|  |  | Mean | Std. Deviation | Std. Error Mean | 95% Confidence Interval of the Differences Lower | Upper | t | df | Sig. (2-tailed) |
|---|---|---|---|---|---|---|---|---|---|
| Pair 1 | BSMAS2 – BSMAS | .61696 | 1.22246 | .09348 | .43242 | .80150 | 6.600 | 170 | .000 |
| Pair 2 | FOMO2 – FOMO | .67251 | 1.19504 | .09139 | .49212 | .85291 | 7.359 | 170 | .000 |
| Pair 3 | SAS2 - SAS | .86725 | 1.50054 | .11475 | .64073 | 1.09377 | 7.558 | 170 | .000 |

**Chapter Five: Conclusions**

**Overview**

This chapter will provide discussions surrounding the results of the study conducted to examine the following research questions:

**RQ1:** What is the moderating effect of smartphone addiction on the relationship between fear of missing and social media addiction for individuals age 19-32?

**RQ2:** Will removing access to social media platforms from smartphones impact social media addiction and fear of missing out?

This chapter will examine whether the results support or contradict previous research conducted. This chapter will examine the implications for therapeutic treatment for families and individuals, who may be struggling with social media addiction, fear of missing out, as well as smartphone addiction. This chapter will also outline various limitations identified in the study and will also outline additional recommendations for future research.

**Discussion**

**Part I:  RQ1**

The purpose of Part I of the study was to examine the first research question surrounding the moderating effect of smartphone addiction on the relationship between fear of missing out and social media addiction. As hypothesized, the moderated multiple linear regression conducted for a convenience sample of 602 young adults, age 19-32 years, revealed that the relationship between fear of missing out and social media addiction was significantly moderated by smartphone addiction. The results of the study reflected that the increase in smartphone addiction was significantly associated with an increase in fear of missing out and social media addiction (Warner, 2012).

These findings are consistent with other research studies that have found positive associations between smartphone addiction and fear of missing out, as well as social media addiction (Hunt et al., 2018; Tromholt, 2016 ). This positive correlation has been the focus of various research studies that have attempted to address the growing concerns surrounding society's shift towards an increased number of social media platforms and the need for instant access through smartphones (Andreassen et al., 2017; Hunt et al., 2018; Tromholt, 2016).  While initial studies focused on children and adolescents, additional research has found that, with the increased use of smartphones, young adults are also impacted as they are constantly online (Andreassen et al., 2017; Greenfield, 2018; Hunt et al., 2018). This increased dependence upon smartphone access to social media has resulted in more individuals struggling with digital addictions that often resemble a substance use disorder (Greenfield, 2018; Hunt et al., 2018).

**Part II:  RQ2**

Part II of this study sought to examine the impact of social media addiction and fear of missing out, if smartphone access to social media platforms is removed, during a timeframe often found with detoxification for a substance addiction (Greenfield, 2018). Part II of the study was also designed to examine the second research question evaluating whether removing access to social media platforms from smartphones would impact social media addiction and fear of missing out. As hypothesized, the paired samples *t* test conducted for a convenience sample of 171 young adults ages 19-32, who participated in the study protocol, revealed a significant difference in the mean scores for both instruments measuring fear of missing out, FOMO, and social media addiction, BSMAS.  The mean scores for Part I and Part II for FOMO and BSMAS reflected moderately severe scores for the presence of fear of missing out and social media addiction.

In previous research studies, removing smartphone ease of access to social media resulted in a significant difference in the mean scores that were positively correlated, reflecting a decrease in the symptoms being studied (Hunt et al., 2018). However, in this study, unlike previous research, the mean scores for FOMO and BSMAS did not reflect a decrease in symptoms with the removal of smartphone social media access (Hunt et al., 2018; Tromholt, 2016). The scores in this study were negatively correlated, which reflected a slight increase in the presence of fear of missing out and social media addiction for the participants who deactivated their smartphones for the two-week period and limited their desktop usage (Hunt et al., 2018; Tromholt, 2016).

For Part I and Part II, the participants reflected moderately severe scores for FOMO of 31.36 and 38 out of 50 respectively and reflected moderately severe mean scores for BSMAS of 19.10 and 22.80 out of 30, respectively. This increase in fear of missing out and social media addiction may have been attributed to the individuals who elected to participate in the intervention protocol for Part II, who had higher mean scores for smartphone addiction than the participants in Part I (Hunt et al., 2018). In reviewing the mean scores for Part I and Part II, the participants reflected moderately severe scores for SAS-SV of 37.78 and 46.45 out of 60, respectively. The increase in mean scores was also observed in the sub-groups. However, overall, the difference in the sub-group mean scores were not found to be statistically significant with males versus females, as well as undergraduate versus graduate students.

This increase in fear of missing out and social media addiction may have also been attributed to the time frame selected for the protocol (Hunt et al., 2018; Greenfield, 2018). For this study, a two-week time frame was utilized to simulate the average time frame recommended for a detoxification center for individuals struggling with addiction issues (Greenfield, 2018).

When reviewing prior research studies, examining the removal of smartphone social media access, a four-week time frame has been utilized, which reflected a reduction in symptoms (Hunt et al., 2018; Tromholt, 2016).

For prior research studies, the primary focus was also on measuring symptoms such as fear and anxiety, self-esteem, as well as the presence of loneliness (Hunt et al., 2018; Tromholt, 2016). The studies reflected positive correlations between these symptoms and the presence of smartphone and social media addictions, as well as fear of missing out (Hunt et al., 2018; Tromholt, 2016). However, unlike this study, the research did not focus solely on the reduction of the mean scores for FOMO and BSMAS, when smartphone access to social media platforms is removed (Hunt et al., 2018; Tromholt, 2016). With a negative correlation observed and a slight increase in the mean scores, this study revealed that more time may be needed for an individual to experience a reduction in the presence of smartphone and social media addiction, as well as fear of missing out (Hunt et al., 2018; Tromholt, 2016).  The symptoms may worsen before they improve (Hunt et al., 2018; Tromholt, 2016). This may also indicate the need to substitute the removal with a different activity to prevent relapse (Hunt et al. 2018).

## Implications

With the variety of mental health challenges emerging surrounding the prevalence of fear of missing out, as well as social media addiction, there has been limited research surrounding their correlation with problematic smartphone use (Andreassen et al., 2017; Tromholt, 2016). This study was able to expand upon the current research surrounding the increasing impact of smartphone addiction, particularly focusing on the young adult population, identified as having problematic use (Hunt et al., 2016). Through the research conducted, the study revealed a positive correlation, where the increase of smartphone addiction was found to be significantly

predictive of an increase in fear of missing out and social media addiction (Hunt et al., 2018; Greenfield, 2018).

**Implications for the Counselor**

This study was also able to expand upon the current research surrounding effective interventions and the amount of time needed for detoxification from smartphone addiction (Hunt et al., 2018; Greenfield, 2018). Although previous research focused on four-week interventions, the two-week period utilized in this study may provide guidance for clinicians seeking to develop short-term, solutions-focused interventions over a period less than 30 days (Hunt et al., 2018). The negative correlations between the mean scores, before the removal of smartphone social media access, and after the two-week protocol, may encourage clinicians to focus on longer timeframes for treatment to ensure there is sufficient time for the participant to detox from smartphone addiction (Hunt et al., 2018; Greenfield, 2018).

Longer treatment times will also provide the clinician with the opportunity to explore additional coping skills to be utilized (Hunt et al., 2018). These may include treatment methods such as cognitive behavioral therapy, as well as incorporating the individual's spiritual foundation and belief system (Miller et al., 2013; Wood et al., 2016). While the millennial generation, which was largely the focus of this study with the age range between 19-32, is not as actively involved in formal church attendance, they are more focused on spirituality and may be open to integrating their spiritual beliefs and practices into treatment (Miller et al., 2013; Wood et al., 2016).

**Implications for the Family**

This study may also provide guidance for family members navigating the appropriate amount of smartphone and social media use for children within the home (Hunt et al., 2018;

Tromholt, 2018). With positive correlations between social media addiction, fear of missing out, as well as smartphone addiction, it may be helpful for families to limit the amount of time in which their members are using their smartphones or accessing social media platforms (Hunt et al., 2018; Tromholt, 2018). While this may have been challenging to assess in the past, current smartphones provide the capabilities to display the percentage of time spent utilizing social media applications, which will allow more accurate tracking of social media usage (Hunt et al., 2018; Tromholt 2018).

**Implications for Spirituality**

From the research discussed in this study, family members may also be encouraged to instill a spiritual foundation and a strong sense of self-efficacy in their children (Miller et al., 2013; Wood et al., 2016). As the array of mental health challenges arise with social media and smartphone addictions, as well as fear of missing out, developing tools to aid in building resiliency are a critical part of recovery (Miller et al., 2013; Wood et al., 2016). Studies have found that, strong spiritual beliefs and practices are effective for helping individuals avoid developing social media and smartphone addictions, as well as helpful in building resiliency for recovery if these addictions occur (Miller et al., 2013; Wood et al., 2016).

<div align="center">

**Limitations**

</div>

This study encountered several important limitations that need to be identified. As discussed previously, this study focused on the age range of 19-32, which studies have found to be at risk of developing a smartphone and social media addiction, who also experience fear of missing out (Hunt et al., 2018; Greenfield, 2018). However, limiting the age range for this study prevents the results from being generalized to other populations. It will be helpful to examine the impact of removing smartphone access to social media for children and adolescents, who may be

18 years old and younger, who are found to be online almost constantly (Bányai et al., 2017; Hunt et al., 2018).

An additional limitation was found with the responses for the instruments used. While Cronbach's α reflected high internal consistency for all variables, this study relied upon self-reporting for the responses to the BSMAS, the SAS-SV, as well as FOMO. The participants were advised that their responses were anonymous through the Consent Form for both parts of the study. Thus, it would be unlikely that the participants were untruthful in their answers.

A limitation was also found with the external validation of the participant's adherence to the removal of smartphone social media platforms for two-weeks. To maintain anonymity, participants were advised to submit the three screenshots taken for the protocol after they completed the second survey, which was required for entry in the raffle for cash prizes. While some participants were compliant with the instructions, others failed to take the required screenshots, particularly at the beginning of the intervention, and at the end of the first week. To verify adherence to the protocol, it may be helpful to have participants submit screenshots more frequently throughout the intervention to ensure they remain compliant with the protocol.

## Recommendations for Future Research

When evaluating future research, it is recommended that additional studies expand the criteria to include children and adolescents. As discussed previously, individuals 18 years and younger have been found to be online constantly, which may result in the individual being predisposed to a smartphone, or social media addiction, as well as fear of missing out at the point in which they reach young adulthood (Bányai et al., 2017; Hunt et al., 2018). There are very few studies, examining smartphone and social media addictions, that focus on individuals considered middle-aged, or the senior population, which future research may want to consider in

determining the prevalence and correlation of the addiction issues. Future studies may also want to consider utilizing a longitudinal design with qualitative methods, as opposed to the experimental design with quantitative methods used in this study. A longitudinal design will allow the participants to be followed over a longer period, which would provide more data points to be measured. This would provide the researcher with stronger evidence of directionality for positive correlations between the variables, which were difficult to assess with a brief experimental design.

Future research may also want to consider the moderation of smartphone addiction, and its correlation, with entertainment applications aside from social media applications. For example, most cable providers have developed applications that allow users to watch television through their smartphones. With the emergence of applications for streaming services, as well as dating and social relationships, the prevalence of excessive smartphone use may be not only be attributed to social media use, but may also be attributed to the use of these entertainment applications (Hunt et al., 2018; Greenfield, 2018).

## Summary

This study highlighted the continued need for research as increasing levels of the digital addiction create the possibility of a public health crisis (Hunt et al., 2018; Greenfield, 2018). This study was able to expand on current research reflecting that smartphone addiction moderates the relationship between fear of missing out and social media addiction, particularly when access to social media applications is removed (Hunt et al., 2018; Greenfield, 2018). However, additional research is needed to aid in the development of effective interventions, particularly as studies examine the addictive behaviors that mirror those of a substance use disorder (Hunt et al., 2018; Greenfield, 2018).

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**Appendix A:  Bergen Social Media Addiction Scale (BSMAS)**

The instrument was removed to comply with copyright requirements.

## Appendix B:  Fear of Missing Out (FOMO) Scale

**Participant Instructions**

Below is a collection of statements about your everyday experience. Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

**Response Anchors**

Not at all true of me | 1
Slightly true of me | 2
Moderately true of me | 3
Very true of me | 4
Extremely true of me | 5

**Items**

1. I fear others have more rewarding experiences than me. _____
2. I fear my friends have more rewarding experiences than me. _____
3. I get worried when I find out my friends are having fun without me. _____
4. I get anxious when I don't know what my friends are up to. _____
5. It is important that I understand my friends "in jokes." _____
6. Sometimes, I wonder if I spend too much time keeping up with what is going on. _____
7. It bothers me when I miss an opportunity to meet up with friends. _____
8. When I have a good time it is important for me to share the details online (e.g. updating status). _____
9. When I miss out on a planned get-together it bothers me. _____
10. When I go on vacation, I continue to keep tabs on what my friends are doing. _____

**Calculating Individual Scores**

Individual scores can be computed by averaging responses to all ten items and forms a reliable composite measure ($\alpha = .87$ to $.90$).

**Notes on Use**

- Where and when possible, randomize the presentation order of these items.
- I am interested to hear about how the work is being used.
- This scale is provided free for personal and academic use.
- If you want to use this measure in a commercial or for-profit organization let me know and we can work out licensing

**Appendix C: Smartphone Addiction Scale Short Version (SAS-SV)**

The instrument was removed to comply with copyright requirements.

**Appendix D:  Consent Forms**

## PART I - CONSENT FORM

Social Media Addiction and Fear of Missing Out:
The Moderating Effect of Smartphone Ease of Access

Angela D. Seabrooks
Liberty University
School of Behavioral Sciences

You are invited to be in a research study on problematic social media use and fear of missing out, and how they are impacted by smartphone ease of access.  You were selected as a possible participant because you are between the ages of 19-32, utilize at least one social media platform, and access your social media accounts through your smartphone.  Please read this form and ask any questions you may have before agreeing to be in the study.

Angela D. Seabrooks, a doctoral candidate in the School of Behavioral Sciences, Department of Community Care and Counseling at Liberty University, is conducting this study.

**Background Information:** The purpose of this study is to determine if problematic smartphone use impacts problematic social media use and fear of missing out.  The study also examines the impact of removing smartphone access to social media on fear of missing out and problematic social media use.

**Procedures:** If you agree to be in this study, I will ask you to do the following things:
1.  Complete the screening questions, which will take approximately 5 minutes or less.
2.  Complete the background questions and instruments, which measure your problematic social media use, fear of missing out, and problematic smartphone use.  This survey should take approximately one hour or less.
3.  Optional: If you elect to participate in Part II of the study, a sheet outlining the instructions will be available at the conclusion of the survey for Part I.  Part II will involve you deactivating your social media smartphone applications for two-weeks and limiting your social media desktop use during this time to two days per week and no more than one hour each day. At the conclusion of the two-week period, you will receive an email inviting you to complete Part II, which will involve a survey re-evaluating your problematic social media use, fear of missing out, as well as problematic smartphone use.

**Risks:** The risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life.

**Benefits:** The potential benefits participants may receive from participating in Part II of this study are a possible reduction in their social media addiction, fear of missing out, as well as smartphone addiction.

Potential benefits to society may include a reduction in the emerging public health crisis developing due to social media addiction.

**Compensation:** Participants may be compensated for taking part in this study. Participants who complete Part II of the study will be entered in a raffle, where they will have the opportunity to win one of three cash prizes of $100.00, $150.00, or $250.00.  Participants will be notified by email if they are the recipient of a prize and will be asked to provide a mailing address for the disbursement.  The prize shall be disbursed in the form of a certified check within seven days of the award.

**Confidentiality:** The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher and the researcher's faculty chair will have access to the records.
- Survey responses will remain anonymous for all participants in the study.
- Data will be stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

**Voluntary Nature of the Study:** Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time prior to submitting the survey without affecting those relationships.

**How to Withdraw from the Study:** If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Contacts and Questions:** The researcher conducting this study is Angela D. Seabrooks. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at ███████████ or by email at ████████████████. You may also contact the researcher's faculty chair, William Bird, at ████████████.

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

***Please notify the researcher if you would like a copy of this information for your records.***

**Statement of Consent:** I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

# PART II - CONSENT FORM

Social Media Addiction and Fear of Missing Out:
The Moderating Effect of Smartphone Ease of Access

Angela D. Seabrooks
Liberty University
School of Behavioral Sciences

Thank you for participating in Part I of the study. You are invited to participate in Part II of the study, which will examine the impact of removing smartphone access to social media platforms on problematic social media use and fear of missing out. You were selected as a possible participant because you are between the ages of 19-32, utilize at least one social media platform, and access your social media accounts through your smartphone. Please read this form and ask any questions you may have before agreeing to be in the study.

Angela D. Seabrooks, a doctoral candidate in the School of Behavioral Sciences, Department of Community Care and Counseling at Liberty University, is conducting this study.

**Background Information:** The purpose of this study is to determine if problematic smartphone use impacts problematic social media use and fear of missing out. The study also examines the impact of removing smartphone access to social media on fear of missing out and problematic social media use.

**Procedures:** If you agree to be in this study, I will ask you to do the following things:
1. Take a screenshot of your smartphone battery usage, which will display the social media applications used. This will take approximately 5 minutes.
2. Deactivate your smartphone social media applications for two weeks and limit your desktop social media use to two days per week and no more than one hour each day during this two-week period.
3. Take a screenshot of your smartphone battery usage each week during this two-week period. This will take approximately 5 minutes each week.
4. At the conclusion of the two-week period, you will complete a survey, which measures your problematic social media use, fear of missing out, and problematic smartphone use. At the end of the survey, you will also attach the three screenshots of your battery usage with the submission of the survey. This will take approximately one hour or less.

**Risks:** While the risks involved in this study are minimal, which means they are equal to the risks you would encounter in everyday life, you may experience some discomfort when you deactivate your smartphone social media applications.

**Benefits:** The potential benefits participants may receive from taking part in this study are a possible reduction in their social media addiction, fear of missing out, as well as smartphone addiction. Potential benefits to society may include a reduction in the emerging public health crisis developing due to social media addiction.

**Compensation:** Participants may be compensated for taking part in this study. Participants who complete Part II of the study will be entered in a raffle to win one of three cash prizes of $100.00, $150.00, or $250.00. Participants will be notified by email if they are the recipient of a prize and will be asked to provide a mailing address for the disbursement. The prize shall be disbursed in the form of a certified check within seven days of the award.

**Confidentiality:** The records of this study will be kept private. In any sort of report I might publish, I will not include any information that will make it possible to identify a subject. Research records will be stored securely, and only the researcher and the researcher's faculty chair will have access to the records.

- For participants who volunteer for Part II of the study, your survey responses will be anonymous.
- Data will be stored on a password locked computer and may be used in future presentations. After three years, all electronic records will be deleted.

**Voluntary Nature of the Study:** Participation in this study is voluntary. Your decision whether to participate will not affect your current or future relations with Liberty University. If you decide to participate, you are free to not answer any question or withdraw at any time without affecting those relationships.

**How to Withdraw from the Study:** If you choose to withdraw from the study, please exit the survey and close your internet browser. Your responses will not be recorded or included in the study.

**Contacts and Questions:** The researcher conducting this study is Angela D. Seabrooks. You may ask any questions you have now. If you have questions later, **you are encouraged** to contact her at (                    ) email at                              . You may also contact the researcher's faculty chair, William Bird, at                        .

If you have any questions or concerns regarding this study and would like to talk to someone other than the researcher, **you are encouraged** to contact the Institutional Review Board, 1971 University Blvd., Green Hall Ste. 2845, Lynchburg, VA 24515 or email at irb@liberty.edu.

***Please notify the researcher if you would like a copy of this information for your records.***

**Statement of Consent:** I have read and understood the above information. I have asked questions and have received answers. I consent to participate in the study.

**Appendix E: IRB Exemption Notification**

# LIBERTY UNIVERSITY.
## INSTITUTIONAL REVIEW BOARD

January 22, 2020

Angela Seabrooks
IRB Exemption 4063.012220: Social Media Addiction and Fear of Missing Out: The Moderating
Effect of Smartphone Ease of Access

Dear Angela Seabrooks,

The Liberty University Institutional Review Board has reviewed your application in accordance
with the Office for Human Research Protections (OHRP) and Food and Drug Administration
(FDA) regulations and finds your study to be exempt from further IRB review. This means you
may begin your research with the data safeguarding methods mentioned in your approved
application, and no further IRB oversight is required.

Your study falls under exemption category 46.101(b)(2), which identifies specific situations in
which human participants research is exempt from the policy set forth in 45 CFR 46:101(b):

> (2) Research that only includes interactions involving educational tests (cognitive, diagnostic, aptitude,
> achievement), survey procedures, interview procedures, or observation of public behavior (including visual
> or auditory recording) if at least one of the following criteria is met:
>
> > (i) The information obtained is recorded by the investigator in such a manner that the identity of
> > the human subjects cannot readily be ascertained, directly or through identifiers linked to the
> > subjects;

Please note that this exemption only applies to your current research application, and any
changes to your protocol must be reported to the Liberty IRB for verification of continued
exemption status. You may report these changes by submitting a change in protocol form or a
new application to the IRB and referencing the above IRB Exemption number.

If you have any questions about this exemption or need assistance in determining whether
possible changes to your protocol would change your exemption status, please email us at
irb@liberty.edu.

Sincerely,

**G. Michele Baker, MA, CIP**
*Administrative Chair of Institutional Research*
**Research Ethics Office**

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