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# Social networking addiction, mental health, personality traits, and user motives

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**2023**

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UNIVERSITY OF THE
WITWATERSRAND,
JOHANNESBURG

# Social networking addiction, mental health, personality traits, and user motives


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A dissertation submitted in fulfilment of the requirements for the Degree of Master of Arts by Dissertation in the Department of Psychology, School of Human and Community Development, Faculty of Humanities, at the University of the Witwatersrand, Johannesburg (13 March 2023).

**Plagiarism Declaration**

I, Irene Sarrimanolis, declare that this research project (Ethics clearance number: H21/07/42) is my own, unaided work. It has not been submitted before for this or any other degree or for examination at this or any other university.

Signed: 

Date: 13 March, 2023

## Abstract

Over the past two decades, researchers have examined whether people's personal and private lives are shaped by the use of online platforms for social interactions. The growing popularity of and reliance on social networking platforms across the world has led to increased concerns about social networking addiction. There is a growing concern and an urgent need for more information about the possible emotional and interpersonal effects of excessive social media use across the world, including in South Africa. This study aimed to explore the nature of the relationships between social networking addiction and depression, anxiety, and stress as indicators of mental health in a South African sample. The study also examined whether personality and user motives moderated the relationships between social networking addiction and depression, anxiety, and stress. In addition, the study explored how participants themselves described their use of social media networks, allowing for a deeper understanding of the potential consequences of the country's high reliance on social media and smartphones.

This study employed a convergent mixed methods approach. For the quantitative component, the design was non-experimental, correlational, and cross-sectional and for the qualitative component, the design was descriptive, interpretive, and phenomenological. For both sections, a non-probability, convenience, and snowballing sampling method was used to gather data from an online survey. The final sample consisted of 612 South African young adults between the ages of 18 and 35. The survey included a demographic questionnaire, the Social Networking Addiction Scale (SNAS), the Depression, Anxiety, and Stress Scale (DASS-21), the Big Five Inventory (BFI), the Scale of Motives for Using Social Networking Sites (SMU-SNS), and short open-ended questions to capture participants' perceptions about using social networking. The data was analysed using descriptive statistics, correlations, hierarchical moderated multiple regression, and conventional content analysis.

All four scales used in this study demonstrated sound internal consistency reliability in the sample. The findings also demonstrated a low prevalence of social networking addiction and moderate levels of mental health problems in the sample. Significant, positive, relationships between social networking addiction and mental health were identified, suggesting that participants who reported higher levels of social networking addiction symptoms also reported higher levels of poor mental health in the form of depression, anxiety, and stress. Multiple regression showed that social networking addiction was also a consistent, significant, and positive predictor of depression, anxiety, and stress in the sample.

With regards to personality, neuroticism was positively related to social networking addiction and extraversion, agreeableness, conscientiousness, and openness were negatively related to social networking addiction. Extraversion, agreeableness, and conscientiousness were all significantly and negatively related to and predictive of depression, anxiety, and stress, while neuroticism was significantly and positively related to and predictive of depression, anxiety and stress. Agreeableness was the only personality trait that significantly moderated the relationships between social networking addiction and mental health in the sample. Specifically, agreeableness moderated the relationships between social networking addiction and depression and social networking addiction and stress such that higher levels of agreeableness reduced the strength of the relationship between these and thus acted as a buffer in these relationships.

With regards to user motives, all nine motives were significantly and positively associated with higher levels of social networking addiction. However, only the motives of new friendships, social connectedness, following and monitoring others, entertainment, dating, and social recognition were significantly and positively correlated with depression, anxiety, and stress in the sample. The motive of academic purposes was significantly and positively related to anxiety and stress, and both information and self-expression were

significantly and positively related to anxiety. In the regression models, only a motive for new friendships significantly predicted depression; motives for new friendships, following and monitoring others, and dating significantly predicted anxiety; and motives for social connectedness and following and monitoring others significantly predicted stress. None of the user motives moderated the relationships between social networking addiction and mental health.

Finally, the qualitative information provided by the participants supported the study's quantitative findings and existing literature pertaining to the harmful effects of social networking addiction and mental health. Major themes that emerged included positive, mixed, and negative emotions from using social networking sites; negative emotional experiences including social pressure, procrastination, constant exposure to negative content, and addiction; over-involvement including excessive time, overdependence, over-investment in online interactions, and negative physical and emotional consequences from overuse; and issues around regulation and comparison with others.

This appears to be the first South African study that has explored the relationships between social networking addiction, mental health, personality, and user motives. The main findings from the study have several potential implications for theory and practice, including the growing usage of social media sites in South Africa and participants' understandings of this, the prevalence of social networking addiction and levels of mental health and the connection between these, and the extent to which personality and user motives play a role in social networking addiction and mental health. The findings also highlight the critical need for more theoretically informed intervention and treatment programmes for excessive social networking use, as well as further research to better understand the mechanisms contributing to current rates of depression, anxiety, and stress in South African young adults.

**Keywords:** social networking addiction; social media addiction; behavioural addiction; mental health; depression; anxiety; stress; personality traits; user motives; South Africa.

**Acknowledgements**

I would like to express my deepest gratitude to my supervisor, Dr Nicky Israel, whose skilful guidance, support and encouragement I will never forget. I could not have asked for a better supervisor. A heartfelt thank you for taking me on as a student and for showing an interest in my research topic. This dissertation could not exist without you.

To my family, thank you. These two simple words fail to demonstrate the immensity of my gratitude for your selfless ways.

Finally, I would like to extend my gratitude to everyone who took the time to participate in this research.

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# CHAPTER 1

# 1 INTRODUCTION

*"The sweetest things become the most bitter by excess."*

Democritus

Society has been profoundly transformed by digital technologies which have both positive and negative consequences for people's lives and change how they learn, think, and communicate. Given its omnipresence and influence on society, it is difficult to comprehend life today without the Internet and other digital technology (United Nations, 2016). Currently, 63% of the world's population—more than 5 billion people—use the internet. In January 2022, the GWI (2022) reported a staggering 4.62 billion social media users worldwide. This represents 58.4% of the entire global population where the average user spends around two hours and 27 minutes per day on social media platforms (GWI, 2022; WeAreSocial, 2022).

Social media use (also called social networking) has gained prominence and significance in recent decades, principally being recognised and accepted as a tool for social interaction and information exchange (Asur & Huberman, 2010; Hebberd, 2015). Given the rapid development of social media which has afforded several advancements for personal, educational, and professional roles, society as a whole maintains a favourable view of social networking and motivates individuals across all fields to make use of it accordingly (Drahošová & Balco, 2017; Edosomwan et al., 2011; Rasiah & Ratneswary, 2014). However, over the past two decades, research studies have demonstrated overwhelming evidence of the emerging potential risks of social networking overuse (Balakrishnan & Griffiths, 2017; Dalvi-Esfahani et al., 2019; Hawi & Samaha, 2017; Hou et al., 2019; Larson, 2021). The

potential emotional and interpersonal impacts of excessive social media use are thus an increasing concern around the world, especially in South Africa.

With westernisation and globalisation, social networking in South Africa has grown considerably, and its role in mental health and behaviour has become increasingly important in recent years (Businesstech, 2019; SA Foundation for Mental Health, 2016; Salubi et al., 2019). The latest ICT Report shows smartphone data subscriptions at 65 million in 2021 (ICASA, 2022). Deloitte (2020) reports that on average, smartphone users check their devices 47 times per day however youth between the ages of 18 and 24 check their mobile phones 86 times per day on average. According to Statista (2022), almost 60% of South African social network users are between the ages of 18 and 34. The survey also identified WhatsApp as the most widely used social media platform that was utilised by 95% of the nation's internet users as of the third quarter of 2021, followed by Facebook (87%) and Instagram (73%). Alarmingly, the average daily time spent on social media in Africa is 3 hours and 10 minutes compared with Europe (1 hour and 15 minutes) and North America (2 hours and 6 minutes) (BroadbandSearch, 2020). Goldstuck (2020) for the World Wide Worx reported that South Africa's top three motivations for using social media were: to stay in touch with what friends are doing (56%); to stay up to date with news/current events (56%) and to find funny entertaining content (50%).

Given the evidence suggesting an increase in the use of and a growing dependence on social networking in South Africa, there are growing concerns about social networking addiction. Social networking addiction refers to individuals who use social networking sites compulsively and excessively (Griffiths, 2000; Starcevic, 2013). A body of literature has revealed that social networking addiction, a type of internet addiction, is becoming increasingly problematic as it is linked to decreases in life satisfaction and increased impairments in work and family environments (Longstreet & Brooks, 2017). An extensive

body of international research has demonstrated that excessive or compulsive use of social networking sites may have a detrimental effect on mental health (Kaur & Bashir, 2015; Pantic, 2014; Rosen et al., 2013; Yu et al., 2016). Furthermore, social networking addiction has been found to be positively related to emotional states, such as depression, anxiety, and stress (Donnelly & Kuss, 2016; Griffiths et al., 2014). On the other hand, other studies have demonstrated negative associations (Griffith et al., 2023) or mixed findings (Seabrook et al., 2016) between problematic, excessive, or addictive use of social networking and mental health. Future studies, therefore, are required to develop more generalised understandings of the implications of using social networks for mental health and to investigate the possibility of creating a comprehensive theoretical justification for social networking addiction (Sun & Zhang, 2020).

In addition to broadening knowledge of the nature of the relationships between social networking addiction and mental health in various contexts and incorporating this into the literature on this topic, there is an increasing awareness of the need to gain a better understanding of other factors that might influence these relationships. One factor which deserves attention is personality which has been closely linked to both pathology and maladaptive behaviour (McCrae, 2006). Conceptually, personality constitutes a combination of… "enduring characteristics and behaviors [sic] of an individual" (APA Dictionary of Psychology, 2023, sec. 1), which may contribute to behavioural addictions (Andreassen et al., 2013). Specifically, understanding how various personality traits may moderate the relationship between social networking addiction and mental health is necessary as these may play a role in exacerbating or mitigating the mental health outcomes of excessive and pathological social networking use, and this could act as an important set of information to inform treatment and psychological intervention. User motives is another factor that deserves consideration as motives may also influence how various social networking symptoms relate

to mental health (Pertegal et al., 2019). The uses and gratifications model emphasises how people actively select and use media depending on their needs (Wu et al., 2010). This also applies to the use of social networks however there is currently very little research available that has explored this, and a better understanding of motives for using social networking could provide an important base of information for treatment and intervention purposes.

In South Africa, little has been studied about the effects of social networking, particularly with reference to addiction. Exploring social networking addiction rates, its links to mental health, and the roles that personality traits and user motives may play in these relationships in the South African context is important for theory and practical intervention given that social networking use has increased exponentially.

### 1.1 Problem statement

This report is about the relationships between social networking addiction, personality, and user motives and whether these concepts relate to mental health in young adults in South Africa. In particular, this study investigated whether the relationships between social networking addiction and mental health differed due to a person's personality characteristics and types of motives for using social networking sites. The aim, therefore, was to determine whether there were significant relationships between social networking addiction, depression, anxiety, and stress in a South African sample and to explore whether these relationships appeared to be different based on the level of each personality trait in the Big Five personality model as well as based on several common types of social networking user motives. In order to enrich the findings further, gaining a better understanding of how participants perceived and described their use of social media networks was also included in the study as an aim.

## 1.2 Justification for the study

The premise for this study is based on the fact that although social networking addiction and its potential connections with mental health concerns have been the focus of several studies internationally (Andreassen, 2015; Cheng et al., 2021; Holmgren & Coyne, 2017), there has been minimal research conducted on the subject in South Africa. In addition, there is limited research that has explored complex models predicting mental health outcomes connected with social networking addiction both internationally and especially in the South African context.

Considering this and the growing prevalence of social networking in South Africa, it is important to gain a better theoretical understanding of the relationship between social networking addiction and mental health, as well as of different models of addiction and the possible interrelationships between mental health, user motives, and personality, both generally and particularly from a South African perspective. The possible link between social networking addiction and negative mental health outcomes may have an impact on behaviour and well-being and furthermore, could create a public health concern. It is hypothesised that people who use social networking sites (SNSs) excessively are more likely to experience mental health issues such as depression, anxiety, loneliness, suicide, and substance abuse (Burns, 2017). As a result, the practical concerns of excessive social media use in this country have not been addressed sufficiently and this study may thus help raise awareness and lay the foundation for intervention and treatment. This study, therefore, could be of value to South African public and private entities, as currently, the idea of social networking for personal, professional, and educational use is strongly advocated by most institutions. For this reason, social networking has indisputably become the societal norm, however, there is a strong need for a better understanding of the implications of this, including the associated prevalence of

social networking addiction and its potential links to negative mental health as well as other factors implicated in this relationship.

As a result, this study explores the nature of the relationships between social networking addiction, personality, user motives, and outcomes related to mental health in a South African sample. It examines the nature of the relationships between social networking addiction and depression, anxiety, and stress as indicators of mental health, as well as the extent to which personality characteristics and user motives may function as moderators of these relationships. Additionally, it seeks to provide insight into how participants themselves describe their use of social media networks, allowing for a deeper understanding of the potential consequences of a country's high reliance on social media and smart phones.

### 1.3 Report structure

Chapter 2 of the report that follows from this introduction will present a literature review that focuses on defining social networking addiction and discussing how this has been demonstrated to have deleterious effects on mental health. It will also provide a discussion of personality characteristics and user motives that may be relevant to social networking addiction and mental health relationships. Accordingly, previously established research in the global context with an emphasis on social networking addiction, mental health, personality traits, and user motives will be reported on and discussed as part of the argument to support the research questions posed in the study.

Chapter 3 will discuss the methods that were used to address the study's research questions, including the research design, sample and sampling strategy, instruments used, procedure, ethical considerations, and data analysis.

Chapter 4 will present the results of the statistical analyses that were conducted to answer the research questions, including establishing internal consistency reliability for the

instruments in the sample, descriptive statistics for the data obtained, and the inferential statistical techniques used to answer the research questions. The chapter will also present the findings from the conventional content analysis used to analyse the qualitative data obtained to answer the research questions in the study.

Chapter 5 will present a review of earlier research combined with a discussion of the findings of the current study and will address its strengths, limitations, implications, and directions for future study.

# CHAPTER 2

# 2 LITERATURE REVIEW

## 2.1 Defining social media and social networking

Social media, according to Kaplan and Haenlein (2010) is "a group of internet-based applications that build on the ideological and technological foundations of Web 2.0 and allow [for] the creation and exchange of user-generated context" (p. 61). More recently, Carr and Hayes (2015, p. 50) offer a more nuanced definition that is predicated on *perceived* interactivity amongst social media users: "Internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others". Social media, therefore, can be regarded as online software that enables users over great distances to interact with others for a wide range of purposes, such as socialising, exchanging information, and general communication. The main reason behind social media's rapid growth is that people yearn for real-time interactions and connections between themselves, and this comes as no surprise given that humans are social beings by nature.

Social media and social networking are distinctly separate web technologies, yet they are closely related (Lama, 2018). In most literature discourse, however, these terms have been used interchangeably and until recently, social networking has been widely regarded as a subcategory of social media. Boyd and Ellison (2007) characterise social networking sites as web-based platforms that allow users to create, share, view, and traverse within the system. Given that social networking sites are constantly evolving, Ellison and Boyd (2013) offer a more refined, updated definition:

> A social network site is a networked communication platform in which participants 1) have uniquely identifiable profiles that consist of user-supplied content, content provided by other users, and/or system-level data; 2) can publicly articulate connections that can be viewed and traversed by others; and 3) can consume, produce, and/or interact with streams of user-generated content provided by their connections on the site. (p.159)

As claimed by Ellison and Boyd (2013), social network sites emphasise the importance of using the term "network" as a noun. This allows users to construct lists of their personal connections as well as view the networks of others. On the other hand, the term "social networking sites"—a noun that can be 'verbed'—suggests the act of actively seeking connections. In support of this view, a social networking site enables the user to form relationships with like-minded people who share common interests, with the main objective or goal being individual or group interaction (Lama, 2018). Examples of such social network sites are LinkedIn, Instagram, WhatsApp, TikTok, Twitter, Facebook, and YouTube to name a few. For the purposes of this study, the terms "social networking" and "social media" are used interchangeably; in line with the vast majority of literary resources consulted which also use both of these terms indiscriminately.

Both the use of smartphones and the use of social network sites in particular is growing rapidly in South Africa as a result of the continued advancement of technology and the increasing integration of social media into daily life (De Doncker & McLean, 2022). Essentially, young adults mostly use social media to keep in contact with friends, have conversations with partners, and stay in touch with other users (Jasso-Medrano et al., 2018). The same study revealed that Facebook was ranked as the second-most significant social media network, after WhatsApp. This supports the findings by De Doncker and McLean

(2022) that demonstrated that WhatsApp was the most popular and preferred social networking site; it fosters social and emotional connections between people who seek support and shared common interests. The consequence of using such social networks frequently, however, is that it should accentuate the potential risks associated with too much time spent online which may potentially result in social networking addiction (Balhara et al., 2018; Chittaro & Vianello, 2013).

## 2.2 Social networking addiction

Digital technologies have rapidly transformed societies over the past two decades where more than half of the world's population is connected through social media (United Nations, n.d.), as a result, the use of social media has become a necessary daily activity for people from all walks of life in areas of business, education, lifestyle, and entertainment. However, the advent of the internet era has given rise to unintended consequences of social media use for psychological wellbeing. The notion of "internet addiction" was first explored by Griffiths (1996a), and since its inception, research has demonstrated that some users who have become overly obsessed or preoccupied with the internet and their smart devices become distraught when they cannot use them. This unhealthy need for and use of social media has become commonly referred to as social networking addiction (Cheng et al., 2021).

Although the phenomenon of addictive internet behaviour has been the topic of discussion and criticism and is not included as a formal disorder in the DSM-5, it has been recognised as a legitimate set of problematic behaviours and is sometimes described using alternate terms. Jasso-Medrano and López-Rosales (2018) argue, "While some researchers position themselves in favor of the term *addiction* others deny the existence of such, relating it more to a behavioral problem" (p. 185). In this context, social networking addiction has been extensively researched and frequently referred to as "problematic", "maladaptive",

"pathological", "compulsive", or "excessive" use (Ahmed & Vaghefi, 2021). The DSM-5 (p. 585) includes a sub-division labelled "Non-Substance-Related Disorders" that relate to behavioural addictions, for instance, Gambling Disorder (Kardefelt-Winther et al., 2017). Behavioural and substance addictions seem to be remarkably similar in that they share some underlying components, according to several researchers. In the case of the former, the person is addicted to the behaviour or feeling induced by the relevant activity and not to the substance.

Over the years, there has been an increase in possible behavioural addictions according to recent psychological literature (Sixto-Costoya et al., 2021). Grant et al. (2010) explain that behavioural addictions are characterised by impulsiveness and the temptation to perform harmful acts to the individual or others. Consequently, individuals with behavioural addiction report urges or cravings before engaging in the behaviour and indicate that the behaviour often elicits sensations of being "high" during the activity. Psychological addiction is "a persistent behavioral pattern characterized by a desire or need to continue the activity which places it outside voluntary control; a tendency to increase the frequency of the activity over time; psychological dependence on the pleasurable effects of the activity; and a detrimental effect on the individual and society" (Walker, 1989, p. 185).

Andreassen and Pallesen (2014) describe social networking addiction as "being overly concerned about social networking, to be driven by a strong motivation to log on to or use social networking sites, and to devote so much time and effort to social networking sites that it impairs other social activities, studies/job, interpersonal relationships, and/or psychological health and well-being" (p. 405). In addition, social networking addiction, which is a secondary form of internet addiction, should be acknowledged as an addiction consistent with Griffith's (1996b, 2005) "components" model of addiction. According to the biopsychosocial model for behavioural addiction, addictive activity is "… any behaviour that

features six core components of addiction (i.e., salience, mood modification, tolerance, withdrawal symptoms, conflict, and relapse)" (Griffiths, 2013, p. 1).

*Salience* occurs when a certain activity takes centre stage in a person's life, controlling their feelings, thoughts, and behaviour. This is characterised by cravings, cognitive distortions, and preoccupations followed by poor social behaviour. For instance, even if a person is not acting out a certain behaviour, they may be planning to the next time (Griffiths, 2005). *Mood modification* is the perceived change in mood that people claim to experience after engaging in a particular activity (typically felt positively); for example, they may feel a stimulating "high" or, ironically, calming or de-stressing feelings of "escape" or "numbing" (Griffiths, 2005). *Tolerance* is the process by which greater amounts of a specific activity are needed to produce previous effects. For example, heroin addicts need to raise the quantity of their "fix" in order to experience the same type of feeling (such as a strong "rush") they earlier experienced with far smaller doses (Griffiths, 2005)**.** *Withdrawal symptoms* relate to the unfavourable emotional and/or bodily reactions that take place when a specific activity is stopped or drastically scaled back. These may be psychological (such as severe irritation and moodiness) or physiological (headaches, insomnia, nausea, sweats, and other responses induced by stress) in nature (Griffiths, 2005). *Conflict* pertains to friction and arguments involving the specific activity that exists between the addict and those around them (interpersonal conflict) or within the addict themselves (intrapsychic conflict); and *relapse* is the propensity to revert to old behaviour patterns after an unsuccessful effort to curb or abstain from these behaviours (Griffiths, 2005).

Griffiths et al. (2016) also conclude that the distinction between excessively healthy enthusiasm and addiction is that the former has minor negative health and psychosocial effects, whilst the latter has significant negative health and psychosocial effects. Larkin et al. (2006) propose that certain types of individuals, certain substances or activities, or a

combination thereof, may cause addiction. Addictive personalities are already predisposed and it is likely that some substances and activities are more addictive than others (Griffiths et al., 2016). Essentially, the negative effects of addiction often include disruptive functioning in life domains, relationship impairment, criminal and legal issues, involvement in risky situations, physical harm, economic loss, or emotional trauma (Sussman et al., 2011).

In the context of the virtual environment, Shahnawaz and Rehman (2020) provide an outline for how each component in the model could manifest as part of social networking addiction. In their interpretation, salience refers to an intense preoccupation with social networking that dominates one's thinking, feeling, and behaviour during other everyday activities; while mood modification refers to actively using social networking sites as a way to alter negative emotions. Tolerance refers to spending increasing amounts of time online in social networking engagements in order to acquire a similar positive outcome, for example, increasing activity on social networking sites to experience a powerful 'rush' once achieved from much less engagement (Shahnawaz & Rehman, 2020). Withdrawal symptoms refer to experiencing unpleasant physical and/or psychological symptoms when one is not able to engage fully on social networking sites, including irritability, sadness, and frustration. Conflict refers to interpersonal and intrapersonal conflict that compromises relationships, work, education, and other daily activities and that is experienced because of social networking use, for example, hiding the amount of time spent on social networking or ignoring sleep. Lastly, relapse refers to failed attempts to control the use of social networking and returning to previous patterns of behaviour (Shahnawaz & Rehman, 2020).

Griffiths (2005) argues that the phenomenon of 'addiction' necessitates behaviour that is beyond problematic as there is a distinct difference between addictive use and habitual or problematic use. It has been argued that in the clinical setting, problematic use of social

networking sites does not imply addiction. However, there is a growing concern that habitual, over-engagement and problematic use of social networking sites may lower productivity in terms of occupation, education, and during daily life activities which may potentially lead to addictive behaviour (Bányai et al., 2017; Casale, 2020; Griffiths & Kuss, 2017). Consequently, over the past decade, a large body of research demonstrated that social networking addiction may lead to various physical and psychological conditions such as eyestrain, back pain, and disrupted sleep patterns (Li et al., 2022; Sheldon et al., 2019; Stevens, 2021), increased stress, depression, anxiety, (Appel et al., 2016; Dieris-Hirche et al., 2017; Haand & Shuwang, 2020; Hussain & Griffiths, 2019; Keles et al., 2020; Mamun & Griffiths, 2019; Nguyen et al., 2020; Ramón-Arbués et al., 2020; Seabrook et al., 2016), loneliness (Dalvi-Esfahani et al., 2019), interpersonal neglect (Bargh & McKenna, 2004), self-consciousness (Lee-Won et al., 2014) and other issues related to mental health.

As specified by Andreassen et al. (2017), research has consistently reported that women are more likely to exhibit addictive behaviours towards social interaction than men. Furthermore, some studies have also yielded higher scores for social media addiction among the younger generation (Li et al., 2022). The youth are inclined to create larger networks and engage in a variety of social media applications and activities indicating the likelihood of perceiving a wider range of benefits from social networking than older people do (Pfeil et al., 2009). As such, overdependence on these social networking circles may contribute towards a higher risk of social media addiction in younger individuals. Overall, Koçak et al. (2021) suggest that there is a decrease in social media addiction as the age of social media users increases and also conclude that the level of education plays a role in social media addiction. Additionally, several studies have demonstrated a positive association between a preference for online interactions and excessive social networking use (Assunção & Matos, 2017; Chittaro & Vianello, 2013; Liu & Ma, 2018). For instance, smartphone users with direct

access to the internet and social media apps feel compelled to go online throughout the day. The urge to log in frequently in order to engage with others is indicative of an impulsive activity and this urge may lead to excessive social networking use.

A meta-analysis conducted by Cheng et al. (2021) revealed that social media addiction prevalence in collectivist nations (31%) is twice as high as in individualistic ones (14%), supporting the importance of understanding the effects of social networking addiction in specific contexts, including South Africa. Salubi et al.(2019) indicate that on a daily basis, 75.6% of South African university students use the internet uncontrollably to engage in chat and social networking sites (Twitter, Facebook, and MySpace) which may be detrimental to academic performance and well-being. Such counterproductive effects are consistent with previous studies showing the negative effects of the internet and social media addiction (Roberts et al., 2014; Stavropoulos et al., 2015).

### *2.2.1 Three models of social network addiction*

From a clinical viewpoint, Turel and Serenko (2012) identified three perspectives that may explain the development of social network addiction: the cognitive-behavioural model, the social skill model, and the socio-cognitive model. They further argue that these overarching models (which are not mutually exclusive) emphasise that addictions have adverse effects on social network users and their environments (Turel & Serenko, 2012).

As set out by Griffiths et al. (2014), the cognitive-behavioural model postulates that maladaptive cognitions combined with certain environmental factors ultimately lead to social networking addiction. Rumination, self-doubt, negative self-appraisal, and low self-efficacy are intensified by several environmental factors such as social isolation, lack of relationship support, and patterns of obsessive use (Turel & Serenko, 2012). According to Ellis (2005) and Beck (1967) what determines behaviours or maladaptive cognitions is not the event itself

but the person's interpretations of that specific event. For example, if a person experiences anxiety and depression as a result of their employer shouting at them, the employee's negative state is not caused by the employer's shouting but rather by the account the employee told themselves about the shouting incident. In his ABC model, Ellis (2005; 2019) describes this as the activating event *A* leading to cognitions or beliefs, *B,* which have behavioural and emotional consequences *C*; instead of *A* directly leading to *C*, as most people would assume. Abnormal perceptions, interpretations, and beliefs, therefore, lead to abnormal behaviour and emotions (Ellis & Ellis, 2019). Specifically, an individual's way of interpreting the environment is based on their core beliefs about themselves and others. Beck (1979; 1967) describes cognitive distortions that are typically made in thinking in conditions such as arbitrary inference, selective abstraction, over-generalisation, and polarised thinking. These maladaptive cognitions, characterised by distorted and irrational thinking, are seen as dysfunctional because they obstruct normal cognitive processes. Davis (2001) gives an explanation of the nature of cognitive theory in relationship to "pathological" internet use. His model describes maladaptive patterns of cognitions and behaviours distinctly linked to the use of the internet that increases the likelihood of negative outcomes in daily life. More specifically, it emphasises that cognitive symptoms of problematic internet use come before and thus may cause affective or behavioural symptoms (Davis, 2001). In a systematic review, Ahmed and Vaghefi (2021) report that users with maladaptive cognitions about themselves and the world interact on social media to feel better. They found that due to escapism (thoughts on the need to avoid the physical world), low self-esteem (thoughts on self-ability), or other maladaptive cognitive factors, individuals who engaged in social media to receive approval from others were more likely to become addicted to networking sites.

The social skill model refers to the assumption that individuals who lack self-presentational skills prefer to interact in virtual environments rather than engage in face-to-

face communications and are thus more likely to develop social networking addiction (Griffiths et al., 2014). The online APA Dictionary of Psychology (2022, para 1.) defines self-presentation as "any behaviors [sic] intended to convey a particular image of, or particular information about, the self to other people". Thus, it refers to how people show themselves in an effort to influence or control how others perceive them. People with well-developed self-presentational skills are typically proficient, tactful, and self-assured in social circumstances and can comfortably fit in in almost any social context (Riggio, 1989). Caplan (2005) explains that deficits in self-presentational skills are characterised by the combination of poor interpersonal competence and social control which suggests that the preference for online interactions may lead to compulsive use resulting in unfavourable consequences. Caplan (2005), through his research findings, observed that problematic users actively seek synchronous communications and individuals who lack interpersonal competencies prefer to use the internet to make new friends while at the same time seeking emotional support from others in real-time. Some users game excessively while others frequent chat rooms across numerous apps. Furthermore, O'Sullivan (2000) maintains that people with social control skills impairments are prone to look for synchronous online interactions in order to improve their perceived self-presentational competence and reduce social risk. This enables these individuals to gain more online confidence, as well as being open and friendly, have more fun, and disclose intimate details about themselves. According to Caplan's (2005) model, those who lack self-presentational skills are particularly prone to view online social engagement favourably compared to face-to-face interaction. Hence, this model predicts a propensity for online social interaction that eventually results in compulsive internet use that has detrimental effects. Stănculescu (2011) asserts that online self-presentation has a self-serving bias due to the necessity for positive self-esteem and cognitive consistency. The urge to present a different version of oneself online as opposed to real life may be a coping

mechanism for conditions such as social anxiety, shyness, low self-confidence, poor social skills, and subjective well-being (Stănculescu, 2011).

Equally, research has indicated that poor social skills may have detrimental effects on a person's psychosocial well-being which usually manifest in signs of depression, social anxiety and loneliness (Davis, 2001). In support of these findings, Segrin (2017) demonstrated that a lack of social skills was linked to poor mental and physical health due to heightened stress levels and increased loneliness. Segrin (1990, as cited in Caplan, 2005), previously noted that poor social skills increase the likelihood of punishment such as interpersonal rejection, relationship failures, and embarrassment. People who are depressed with poor social skills frequently find themselves in challenging situations because others find their depressive behaviours to be off-putting. As a consequence, their social environment rejects them, which perpetuates their depressive state. Another study found that clinically depressed individuals report notable negative interpersonal life events, exhibit poor social skills and social competence, and are at a greater risk for suicidal behaviour and substance abuse (O'Shea et al., 2014). Increasingly, for these reasons, a lack of social skills and an excessive need for online social connection are gaining more attention as possible explanations for social networking addiction.

The socio-cognitive model focuses on the combination of the individual's positive expectations, internet self-efficacy, and low self-regulation that eventually result in social networking addiction. In this view, self-efficacy, combined with one's positive expectations, is dominated by the attitudes of the larger population regarding social media enjoyment (Denham, 2004). Internet self-efficacy is referred to as the ability to confidently plan and execute online actions required to accomplish a goal (Eastin & LaRose, 2000). A person who spends excessive amounts of time on social networking sites and is surrounded by other excessive users, for example, will only receive positive affirmation for this behaviour. This is

supported by LaRose et al. (2003), who propose that such motivations and rewards might lead to a decrease in self-regulation.

According to Bandura's (1977) social cognitive learning theory, people have a wide range of capabilities that underlie how they function in the context of the interactions between themselves, their environment, and their behaviour. Two central components of these capabilities are self-efficacy (believing that one is capable of functioning effectively in a given situation and self-regulation (one's ability to live by one's own standards without the need for others' approval). Bandura (1977) states that self-regulation, which encompasses internal self-reinforcement ('well done me') and internal self-punishment ('stupid me'), is described as the most important form of learning. The effect of the reward or punishment depends on the individual's interpretation. Online self-regulation, as suggested by Ozimek et al. (2021), involves processes that encompass goals or needs such as self-presentation, social comparison, and belongingness. The authors concluded that attempts to use social media in order to regulate the self are largely unsuccessful. As a result, people fail to meet their goals and instead experience unhappiness. Deficiency in self-regulation, according to Zimmerman (2000), stems from deep-rooted ineffective beliefs, habits, and lifestyle choices. Consequently, social comparisons are made in order to evaluate one's outcomes which often turn out to be unfavourable. Furthermore, Zimmerman (2000) notes that individuals who typically suffer from depression and other mood disorders tend to set unreasonable, high standards for themselves. In accordance with Fardouly et al. (2015) and Scully et al. (2020), using social media platforms such as Facebook can make women feel worse about themselves. Spending time on Facebook also increased the desire for women who compared their appearances with others. Furthermore, the proclivity for using social networking platforms as a tool for making instant social comparisons on one's social outcomes, for example, status, wealth, and lifestyle, may be what drives social networking addiction (Kim

et al., 2021). Research thus suggests that the detrimental effects of frequent and excessive social media use on well-being are partly due to poor self-regulation that leads to comparisons, low mood, and depressed feelings. To conclude, social media users who struggle to regulate their use of social media are more likely to develop social media addiction (Khan et al., 2021).

Although each of these models provides a different account of the underlying causes of social networking addiction, all three suggest that social networking addiction has detrimental effects on users (Turel & Serenko, 2012), with growing empirical evidence to support this claim.

### 2.3 Social networking addiction and mental health

Recent systematic reviews support the idea that excessive use of social media has a negative impact on mental health and well-being (Casale & Banchi, 2020; Keles et al., 2020), which depends on behavioural factors (Clark et al., 2018). Griffiths et al. (2014) indicate that although people use social media for online interaction and the sharing of information considerably, excessive, and problematic as well as pathological use may create problems in their personal, social, vocational, and educational lives. For example, loneliness (Dalvi-Esfahani et al., 2019; You et al., 2019), unstable interpersonal relationships (Bargh & McKenna, 2004), decreases in work productivity (Priyadarshini et al., 2020), and decreases in academic performance (Al-Menayes, 2015) have been associated with excessive and problematic social networking use.

The World Health Organisation (WHO) defines mental health as **"**a state of mental well-being that enables people to cope with the stresses of life, realize their abilities, learn well and work well, and contribute to their community" (WHO, 2022). The Centers for

Disease Control and Prevention (CDC*)* expands on the WHO's definition to include all four domains of human development: cognitive, emotional, psychological, and social wellbeing (CDC, 2021). These exert an influence on one's thinking, feelings and actions, therefore, exposure to unfavourable conditions may affect mental well-being. Mental disorders, as evidenced in numerous studies, have been linked to increased social media use (Nguyen et al., 2020; Panea-Pizarro et al., 2020; Rosen et al., 2013). Depression, anxiety, and stress, in particular, are seen as significant indicators of mental health which, if treatment is not received, can have a negative impact on individuals overusing social networking sites (Ramón-Arbués et al., 2020).

The prevalence of depression increased by more than 18% globally between 2005 and 2015, and it is now recognised as a major contributor to illness and disability (WHO, 2017). More recently, *Nature* publicised that the estimated global prevalence of depression was 28.0%, and anxiety was 26.9% (Nochaiwong et al., 2021a). In the *Diagnostic and Statistical Manual of Mental Disorders, 5th edition* (American Psychiatric Association, 2013), the common feature of depression "is the presence of sad, empty, or irritable mood, accompanied by somatic and cognitive changes that significantly affect the individual's capacity to function" (p. 155) whereas anxiety is "anticipation of future threat" (p. 189) or an emotional state exhibiting physical symptoms of hyperarousal, for example, a dry mouth, tachycardia, and sweaty palms (Clark & Watson, 1991). Several researchers have attributed the construct stress or tension to an accumulation of symptoms that display "irritability, restlessness, nervous tension, agitation, difficulty relaxing, and low frustration tolerance" (Szabó, 2011, p. 93).

Having developed and evaluated the Depression Anxiety Stress Scales (DASS) that were used in this study, Lovibond and Lovibond (1995) differentiate between depression, anxiety, and stress. They specify that depression can be characterised mainly by a loss of self-

esteem and motivation, and perceptions that life goals are unlikely to be achieved; anxiety is characterised as having an acute response of fear; and stress suggests a constant state of arousal and tension and sensitivity to being easily irritated or annoyed (Lovibond & Lovibond, 1995).

To be more precise, an extract from the "Manual for the Depression Anxiety & Stress Scales" describing each emotional state is as follows:

> The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest/involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive and impatient. (Psychology Foundation of Australia, 1995, para. 2)

Previous empirical studies have explored the relationships between social networking addiction and mental health (Bashir & Bhat, 2017; Hussain & Griffiths, 2019; Jovanović et al., 2021; Karim et al., 2020). Depression was the most consistently measured outcome throughout 13 studies in one systematic review examining the possible link between adolescent usage of social media and mental health issues (Keles et al., 2020). This review identified time spent on social media, repetitive message checking, personal investment, and problematic or addictive use as the main risk factors for depression, anxiety, and psychological distress. Social networking addiction was found to correlate positively with depression in college students (Donnelly & Kuss, 2016). Results suggested that Instagram use and social networking addiction were both predictors of depression. Equally, Bányai et al.

(2017) reported positive associations between time spent on social media, high levels of depressive symptoms, and low self-esteem in adolescents. Of these sixteen-year-olds, 4.5% were considered ‘at risk’ of becoming addicted to social networking. According to a recent quasi-experimental study, the introduction of Facebook to college students increased affective symptoms relating to mental health, particularly depression (Braghieri et al., 2022). In another experimental study, Hunt and colleagues (2018) observed a direct causal relationship between limited use of social media and significant increases in levels of depression and loneliness. Jovanović et al. (2021) found that withdrawal symptoms were the predominant core component of the model of addiction, where depression and anxiety symptoms were 4.3 times and 6.8 times more severe in those who were addicted. Equally, 17.9% and 30.7% of respondents, respectively, reported moderate to extremely severe levels of depression and anxiety symptoms.

In relation to stress, social media users often actively look for a social network where they can get social support in order to avoid loneliness and meet their demand for social connection. Brailovskaia et al. (2019) indicate that daily stress was positively correlated with Facebook usage intensity and the propensity for social networking addiction, particularly for those individuals who lacked social support. Recent research also suggests that stress has a significant and adverse effect on cyberloafing and phone addiction; possibly because cyberloafing is a means of reducing stress (Gökçearslan et al., 2018).

In South Africa, there is limited data that has been reported for depressive and anxiety disorders in the last decade, but the data that is available suggests that these are prevalent. According to the South Africa Stress and Health (SASH) 2008 study, depression (9.8%) and anxiety disorders (15.8%) are the two common mental disorders with the highest lifetime prevalence among South African people (Kaminer et al., 2018). Pillay (2019) and SADAG (2022) report that anxiety, depression, or substance abuse issues affect up to one in six South

Africans. A Cape Town youth study suggests possible risks that compulsive social media use has on their psychological health, particularly related to depressive symptoms (De Doncker & McLean, 2022). The results revealed a strong presence of addiction to social media, suggesting that the users were tense and anxious when their digital devices were not within reach.

The potential impact that excessive social network use has on people's mental health highlights the importance of examining the nature of the associations between social networking addiction, depression, anxiety, and stress. These associations may possibly have negative effects among young adults whose proclivity towards technology has shown a heavy reliance on the internet. Given the fact that social networking sites have been gaining immense popularity among most South Africans, it is crucial to determine how online social networking may relate to psychological distress in the form of depression, anxiety, and stress in South African populations.

## 2.4 Personality, social networking addiction, and mental health

"Personality is the dynamic organization within the individual of those psychophysical systems that determine… characteristic behavior [sic] and thought" (Allport, 1961, p. 28). This definition was predicated on Allport's view that human behaviour is produced by a combination of general characteristics (common traits) and neuropsychic structures (personal dispositions) (Allport, 1966). Allport claimed that traits are the fundamental aspects of personality and that they are present in the neurological system (Allport, 1966). Over time, several factor analysts generated factors from numerous abstractions which laid the foundations for the Five Factor Model and these factors were later reintroduced by Goldberg in the 1980s as the "Big Five" (1982, as cited in Digman, 1990). Subsequently, McCrae and Costa (1985, 1987) started a longitudinal study programme to

examine and validate the Big Five traits in a large sample of normal individuals. The contributions of McCrae and Costa, which were made possible by the assessment of the Big Five model, are now widely recognised (de Raad & Mlačić, 2015). These basic tendencies, attributes, or traits that were derived from empirical research are understood to be predispositions of specific behaviours and are regarded as relatively stable throughout adulthood (Foxcroft & Roodt, 2018). Thus, the key perspectives of the trait theory have been on stable differences or consistencies between people, and on the practical implications of these differences in order to demonstrate predictors of criteria, for example, psychopathology, educational achievement, and work success (Foxcroft & Roodt, 2018).

The Big Five model comprises five personality dimensions that include "extraversion, agreeableness, neuroticism, conscientiousness, and openness to experience" (McCrae & John, 1992, p. 175). These dimensions are bipolar, suggesting that they are present in low amounts at one pole and high amounts at the other (Foxcroft & Roodt, 2018). The following is a brief description of each dimension or trait: Extraversion is characterised by positive affect, decisive thinking, assertiveness, and social attention-seeking behaviours (Wilt & Revelle, 2016). Extraverts are typically described as being warm, lively, sociable, dominant, active, and talkative. On the other hand, introverted individuals are commonly seen as being quiet, more reflective, aloof, and inhibited (McCrae & Costa, 2006). Next, agreeableness relates to the qualities of trustworthiness, generosity, and altruism (McCrae & Costa, 2006). Individuals high in agreeableness are typically seen as being polite, compassionate, selfless, trusting, and compliant, whereas individuals low in agreeableness are less friendly, tough-minded, stubborn, and less cooperative (Kuss, Griffiths, et al., 2013). Disagreeableness has certain advantages, however, for example, toughness and arrogance are required characteristics for certain professions (McCrae & Costa, 2006). Neuroticism is referred to as the propensity for an individual to experience distress that affects interpersonal functioning. Affected

individuals are typically prone to being fearful, erratic, quick-tempered, insecure, and vulnerable. People with high neuroticism levels are inclined to worry about everything and are more likely to experience negative emotions, including anxiety and depression (McCrae & John, 1992). Conversely, those with low neuroticism are more likely to exhibit a calm and relaxed demeanour, although this does not imply that they are more likely to experience optimal mental health. In effect, they are considered to be more emotionally stable (McCrae & John, 1992). Conscientiousness relates to productivity and accomplishment. A highly conscientious person is known to be well-organised, hardworking, and self-disciplined. People low in conscientiousness are perceived as being less strict with themselves and others, "easy-going, and lackadaisical" (McCrae & Costa, 2006, p. 47). Lastly, openness to experience refers to the acceptance of new experiences, ideas, and approaches (McCrae & Costa, 2006). High scorers in openness to experience are seen as open-minded, progressive, adaptable, and creative, whereas low scorers in this dimension prefer to remain steadfast on traditionally familiar situations and experiences. In accordance with McCrae and Costa (2006), low scores on this attribute are not necessarily indicative of defensiveness, intolerance, criticism, or narrow-mindedness.

In validation studies, Costa and Widiger (2002, as cited in McCrae, 2006, p. 51) affirm, "…strong links have also been shown between the Five Factor Model (FFM) and measures of psychopathology". The authors validated meaningful correlations between the NEO Personality Inventory (NEO-PI), which was designed to measure the Five Factor Model, and the Minnesota Multiphasic Personality Inventory (MMPI) among other measures. McCrae (2006) adds that the NEO-PI includes scores for anxiety, depression, vulnerability, impulsiveness, and self-consciousness to measure neuroticism; these were found to be related to borderline personality disorder measurements. Furthermore, negatively correlated agreeableness (arrogance, suspicion, and aggression) together with scales that assess

paranoid, narcissistic, and antisocial personality disorders has provided more evidence of the continuum between normal and abnormal features (Costa & McCrae, 1990).

As evidenced in another study, individuals who score extremely high on certain traits of the Five Factor Model are at increased risk of exhibiting maladaptive behaviours (Andreassen et al., 2013). In the study, it was found that both neuroticism and extraversion were positively related to most behavioural addictions such as excessive internet and phone use, compulsive buying, studying, and exercising. The researchers suggested that these positive associations might indicate some underlying pathology at play. On the other hand, openness, agreeableness, and conscientiousness were negatively related to some of these behavioural addictions, and the authors proposed that these traits might act as protective factors against maladaptive behaviours. Overall, Andreassen et al. (2013) concluded that behavioural addictions may be linked to personality traits, although these relationships vary.

Several researchers have investigated personality factors and how they relate to internet addiction and, more specifically, to social networking addiction. These findings suggest that personality traits may be important moderators in the relationships between social networking addiction and other variables, including mental health outcomes. Firstly, a meta-analysis conducted by Kayiş et al. (2016) showed that internet addiction was significantly related to personality traits. It was found that in this context, extraversion, openness to new experiences, conscientiousness, and agreeableness were negatively associated with internet addiction whereas neuroticism was positively correlated with it. Consistent with the literature, it is understood that neuroticism is a risk factor towards internet addiction, whereas conscientiousness, agreeableness, extraversion, and openness to new experiences at higher levels are protective against it (Andreassen et al., 2013; Blackwell et al., 2017; MacLaren et al., 2011). Ehrenberg et al. (2008) suggest that those with high neuroticism prefer online contact to offline communication due to social anxiety. Other

studies have revealed that internet addiction in younger individuals has been frequently linked to low conscientiousness and high neuroticism (Kuss et al., 2013; Zhou et al., 2017). In particular, Zhou et al. (2017) found that the extent to which interparental conflict and emotional insecurity led to adolescent internet addiction was increased for adolescents with higher levels of neuroticism and extraversion.

Regarding addiction to social networking platforms, El-Tah and Aradat (2018) found that the intense use of social networking sites such as Facebook was positively affected by extraversion, not affected by openness to experience, and negatively affected by three personality traits: conscientiousness, agreeableness, and neuroticism. Given that extroverted personalities have a strong desire for social interaction, overuse of social media sites may lead to addiction, although other research suggests that extraversion is associated with lower levels of addiction (Andreassen et al., 2013; Blackwell et al., 2017; Kayis et al., 2016). Highly conscientious individuals prefer to manage their internet usage in their social and professional settings while open individuals generally have unlimited interests, are curious and nonconformists, and thus tend to seek out new situations effortlessly (Alonso & Romero, 2020). Kircaburun and Griffiths (2018) also found that conscientiousness and agreeableness had negative associations with Instagram addiction. Based on these findings, individuals with low agreeableness may use social networking sites, such as Twitter, pathologically. For example, low scorers in agreeableness are typically more aggressive, which leads to interpersonal conflict, and breakups in the physical world (Ozer & Benet-Martínez, 2006). As a result, Zhou et al. (2017) explain that these individuals may be more inclined to use the virtual world to fulfil their need for friendship and connection.

In another study, Kircaburun et al. (2020) reported that introversion, lower conscientiousness, high agreeableness, and neuroticism were all associated with problematic social media usage, particularly in women. Even though introverts spend a lot of time on

social media, they rarely post selfies or status updates because they want to protect their sense of self-esteem from criticism (Kircaburun et al., 2020). The authors specify that in order to avoid conflicts and social interactions in real life, introverts prefer to spend most of their time on social media viewing other people's posts without engaging in conversation. Moreover, less conscientious individuals tend to act carelessly and inconsistently, have less self-control, are emotionally driven, and lack ambition (Costa & McCrae, 2008). Ahmed et al. (2022) also reported that low conscientiousness was significantly related to problematic social media use in university students; low agreeableness, low conscientiousness, and excessive social media use were predictors of problematic social media use; and low conscientiousness, high neuroticism, and problematic social media use were significantly linked to poor mental health. Further findings from a recent meta-analytic study with 74 samples and a total sample size of 32,032 showed that while agreeableness and conscientiousness were protective factors against social media addiction, neuroticism was a risk factor (Huang, 2022). This study also found that the empirical results for the relationships between social media addiction and personality traits varied greatly and concluded that these inconsistencies found seemed to be country specific. For example, measures of the Big Five traits and social media addiction show mixed moderating effects depending on the country under study (Huang, 2022).

Taking into account the above findings, one may infer that research has indicated that the relationships between personality traits and social media addiction have been somewhat ambiguous with mixed findings. Despite this, certain patterns seem to have emerged; extraversion seems to be associated with less addiction/problematic use, whereas low conscientiousness, high neuroticism, and low agreeableness all seem to be associated with more addiction/more problematic use. Openness to experience appears to be more ambivalent.

Whilst there is support for established associations between social networking addiction and personality traits in international literature, there appears to be very little research on these variables and their relationships in South Africa. Furthermore, there is a lack of exploration of whether personality traits might moderate the nature of the relationships between social networking addiction and mental health outcomes. For this reason, this study contributes to existing research that has highlighted the role of personality traits as a moderator in the relationships between social networking addiction and other variables. Specifically, to better understand the nature of the relationships between social networking addiction and mental health outcomes, this study investigated whether individuals with high levels of certain personality traits might experience worse mental health outcomes than those with lower levels of these traits. Similarly, it was important to consider whether various personality traits might act as a buffer in the relationship between social networking addiction and negative mental health effects, possibly reducing this severity. This study, therefore, explored both the direct relationships between the Big Five personality traits and social networking addiction and the role of these traits as potential moderators of the relationships between social networking addiction and mental health outcomes.

## 2.5 Motives behind the use of social networking sites

People use social networking sites for a variety of reasons, and some of these, as outlined in the models of social networking addiction above, may predispose individuals to excessive social media use and/or addiction (Kuss & Griffiths, 2017).

This study explored motives for social networking from a psychological and behavioural perspective explained by the Uses and Gratification theoretical framework (Katz et al., 1973). According to this theory, individuals spend excessive time searching for media content in order to satisfy their psychological needs (Ko et al., 2005). More recently, Pertegal et al. (2019) stated the following basic tenets of this theory: the user utilises social network

sites because they expect specific gratifications; the user experiences at least some enjoyment after using it, such as searching for information or passing the time, and this incites further use.

Recent publications highlight the most commonly explored motives behind social network use, specifically: maintaining relationships, seeking information, and entertainment (Pertegal et al., 2019) and self-expression and passing time (Wang et al., 2016). It has also been reported that social connecting, time-wasting, and loneliness are related to excessive use of social networking (Giannakos et al., 2013; Teppers et al., 2014). Another study found that the combination of user motives and the amount of time spent on Facebook showed negative outcomes for psychological well-being (Rae & Lonborg, 2015). Users were found to have increased levels of depression and anxiety when making new friends was the main motive. In contrast with this finding, the authors observed an increase in life satisfaction when the users connected to existing friends on Facebook. Karayigit et al. (2021) observed positive associations between social networking addiction and motives of social connectedness and social recognition. Kircaburun et al. (2020) found that motives such as entertainment, socialising and meeting new people, and putting forward a more popular self were all associated with higher levels of problematic use of social media. They also found links between certain motives for using social media and certain personality traits, for example, extraverts in their sample used social media to maintain relationships, pass the time, and manage tasks; whereas those with high levels of openness to experience used social media for informational and educational purposes as well as to maintain relationships. In their study, Pertegal et al. (2019) noted that extroverts were inclined to expand their social networks in search of dating, new friends, and social recognition. Furthermore, those with high neuroticism scores spent more time on sites anonymously, preferred to follow and monitor others, and had no interest in dating. Ferris et al. (2021) analysed the effects of social media

addiction using the Uses and Gratifications model. The results revealed that the leisure motive was a significant determinant in terms of intrusive consequences. In other words, people who use social media for entertainment purposes and to avoid boredom are more likely to perceive social media as a timewaster and are aware that time may be better spent on other tasks that are considered more productive.

This study focuses on nine motives that Pertegal et al. (2019) view as the most prominent motives for using social media networks. These facets relate to: dating (finding a partner), new friendships (meeting new people and making friends), academic purposes (information seeking for one's studies/work), social connectedness (need for belongingness to one's community), following and monitoring others (keeping a close eye on friends' lives and activities), entertainment (seeking amusing and relaxing content), social recognition (seeking popularity and approval from others such and likes and positive comments), self-expression (expressing one's feelings and opinions), and information (following current news, trends and societal issues).

As reported by Pertegal et al. (2019), high motive scores on self-expression and following and monitoring others were indicative of an individual's need for social support, while loneliness was linked to seeking social connection, possibly by compensating for real-life isolation. Lastly, individuals on social media sites who actively maintained their groups or circle of friends to stay informed increased their life satisfaction.

While research indicates associations between motives for social media use, social networking addiction, and personality traits, there appears to be very little research that has examined the relationships between motives for social network use, social networking addiction, and mental health, and whether motives for social media usage might moderate the relationships between social networking addiction and mental health outcomes. To better understand the complex interactions between social networking addiction and mental health,

it was important to investigate whether people with particular motivations for using social media experience worse or better mental health outcomes.

As a result, this study explored both the direct relationships between motives for using social media and social media addiction and the role of these motives as potential moderators of the relationships between social media addiction and mental health outcomes.

## 2.6 THE CURRENT STUDY

Due to the increased use of social media and social networks among young South African adults, social networking addiction is now a more prevalent risk than previously (De Doncker & McLean, 2022; Salubi et al., 2019). According to research, social networking addiction is associated with poorer mental health outcomes, including higher levels of depression, anxiety, and stress (Jovanović et al., 2021; Seabrook et al., 2016). Research also suggests that both personality and social networking user motives may relate to and play a role in predicting social networking addiction (Chen & Roberts, 2020). There is, however, a limited amount of research that is available regarding the complex relationships between these constructs, and this is especially the case in the South African context. There also appears to be very little research that has explored whether personality and user motives may moderate (exacerbate or buffer) the relationships between social networking addiction and mental health, both internationally and in South Africa. Gaining a better understanding of these relationships as well as how social networking use is perceived by young adults in South Africa is especially relevant, as this can contribute towards a theoretical foundation for effective context-specific interventions and initiatives.

To conclude, the purpose of the current study was to explore the nature of the relationships between social networking addiction, personality, user motives, and mental health outcomes in a South African sample, and, in addition, to explore the extent to which

personality traits and motives for use may act as moderators of the social networking addiction-mental health relationships as well as participants' perceptions of using social networking. This study could be valuable for South Africa as it may contribute to a better understanding of the possible implications that may result from persistent and heavy reliance on smartphone devices and social networks, especially for mental health.

## 2.7 RESEARCH QUESTIONS

The specific research questions for this study were as follows:

1. What are the reported levels of social networking addiction and mental health (represented by levels of depression, anxiety, and stress) in the sample?
2. What is the nature of the relationships between social networking addiction and mental health (levels of depression, anxiety, and stress) in the sample?
3. What is the nature of the relationships between the Big Five personality traits (openness to experience, extroversion, conscientiousness, agreeableness, neuroticism), social networking addiction, and mental health?
4. Do the Big Five personality traits moderate the relationships between social media addiction and mental health?
5. What is the nature of the relationships between social networking user motives, social networking addiction, and mental health?
6. Do social networking user motives moderate the relationships between social networking addiction and mental health?
7. What are participants' perceptions of using social networking sites and how this relates to their mental health?

The moderation process is illustrated in Figures 1.1 and 1.2

***Figure 2.1*** *Study model for social media addiction and mental health with personality as the moderator*

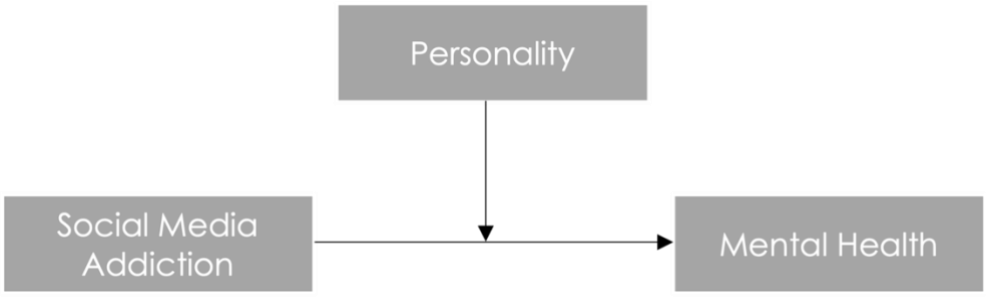
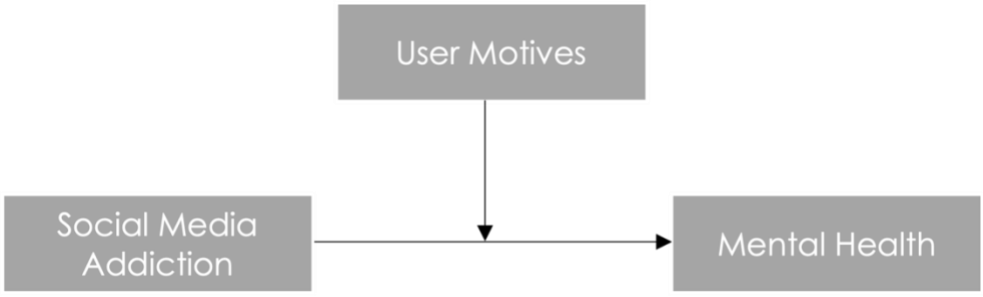



***Figure 2.2*** *Study model for social media addiction and mental health with user motives as the moderator*



# CHAPTER 3

# 3 METHODOLOGY

In this chapter, the methods that were used to answer the research questions in the study are discussed, in particular, the study's research design, sample and sampling strategies, instruments, procedure, ethical considerations, and data analysis.

## 3.1 RESEARCH DESIGN

The study adopted a survey-based approach in order to collect both quantitative and qualitative data relevant to the topic. As stated by Boeren (2018), questions in surveys are often in forced-choice formats, such as checklists and Likert-type scales, while others can be open-ended, allowing the respondent to come up with their own response. The survey in this study consisted of several forced-choice questionnaires designed to measure the key variables in the study as well as a short series of open-ended questions to capture participants' perceptions about their use of social networks.

For the quantitative component of this study, a non-experimental, correlational, and cross-sectional design was used to collect and analyse the data (Salkind, 2012). According to Leedy and Ormrod (2019), correlation refers to the statistical method used to determine whether two or more variables are in any way related to one another. They explain that although correlational studies can be performed to determine whether associations exist between variables, they do not prove cause-and-effect relationships. Nevertheless, the flexibility and functionality of correlational designs are valuable for exploring and establishing the types of relationships that exist between variables (Terre Blanche et al., 2006). In addition to being cost-effective and practical, correlational designs are frequently considered to be less artificial than experimental designs (Price et al., 2017). One explanation

for this is that they do not involve any variable manipulation and merely explore relationships that already exist. Non-experimental designs are a useful alternative for observing and exploring the various relationships that exist between variables in the real world without interference. They do not allow for causal inferences to be drawn, however, this does not imply that a non-experimental design is less useful than an experimental design (Price et al., 2017). The design of this study was non-experimental due to the lack of manipulation, as well as the absence of control and experimental groups and random assignment (Kraska, 2012).

Furthermore, the cross-sectional approach studies many groups of individuals simultaneously at any given moment in time (Price et al., 2017). One drawback is that cross-sectional designs describe and allow for comparisons between individuals, thus, they are susceptible to time of measurement effects (Salkind, 2012).

For the qualitative component of the study, a phenomenological approach was used to gain a deeper understanding of the participants' perspectives (Teherani et al., 2015). In particular, the authors note that this approach is a type of qualitative inquiry that places an emphasis on the lived and experiential aspects of a given construct and the way one experiences a particular phenomenon at the moment it occurs. The goal of phenomenology is to capture the essence of a phenomenon by looking at it from the viewpoint of people who experienced it in order to understand the meaning that participants assign to it while taking into account what the person experienced and how they experienced it (Teherani et al., 2015). Findings, therefore, enrich knowledge of the phenomenon in particular contexts.

The study as a whole was positioned within the post-positivist paradigm with an element of interpretivism. Although post-positivism maintains an emphasis on the scientific method, it views reality as subjective which necessitates an understanding of the world derived from human experiences in contexts where meanings and interpretations are acknowledged (Fox, 2008). In light of this perspective, the interpretive (or

phenomenological) paradigm represents an “understanding of phenomena from within their context” (Terre Blanche et al., 2006, p. 275) and where research aims to explain people's subjective reasons and meanings that they attach to their actions.

Because this study included both quantitative and qualitative strands, it can be classified as mixed-methods research (Creswell & Clark Plano, 2017). An advantage of adopting this approach is that it allows for an enhanced understanding of the relevant topic using different methods of investigation. More specifically, the design of this study can be classified as a convergent design (triangulation design) which is a widely used mixed methods approach where the researcher collects both qualitative and quantitative data simultaneously and analyses the databases separately, thereafter, merging the two in order to compare or combine the results (Creswell & Clark Plano, 2017). The purpose of employing this design is to combine the strengths and weaknesses of both research techniques and thus gain a fuller understanding of the phenomenon under investigation (Creswell & Clark Plano, 2017).

### *3.1.1 Sample and sampling*

The sampling strategies that were used in the study were non-probability sampling methods, specifically convenience and snowball sampling through contacts to obtain a sufficiently large volunteer-based sample (Salkind, 2012). Participants were recruited from various social networking sites with the aid of the snowball sampling method. In each case, an invitation that could be forwarded to others was posted along with a link to the participant information sheet and survey. In addition, permission was obtained from the University of the Witwatersrand to approach all registered students to invite them to participate in the study voluntarily. The invitation, participant information sheet, and online survey link were distributed to these students via email. According to Salkind (2012), non-probability sampling is a subset of sample selection that employs non-random methods for selecting a

group of unidentified people for a research study and where the probability of members of the population being included is not equal. Non-probability sampling, therefore, was used in this study since it was not possible to approach every person in the target population of young South African adults. Further, convenience sampling was used in view of the fact that participation was voluntary and depended on accessibility, availability, and willingness to participate (Price et al., 2017). Snowball sampling was also used with the expectation of increasing the sample size based on the likelihood that participants would recommend others via their contacts and social networks to partake in the study. Gideon (2012) describes convenience sampling as a strategy that enables the researcher to select their sample by merely including individuals who are readily available or who can be easily recruited to take part in the study and snowball sampling as a form of referral where each voluntary participant is asked to recommend other individuals who fit specific characteristics to take part in the study. Non-random samples are more than sufficient for research purposes and "can be very useful for testing theory about processes that are considered to be universal" (Durrheim & Painter, 2006, p. 139), however, Stangor (2011) indicates that the likelihood for sampling bias is high due to the possible differences between the people in the sample versus the general population. The disadvantage of non-probability sampling procedures is that since the samples are not representative, they cannot be used to make inferences about the population's characteristics.

For this study, an adequately sized sample was obtained consisting of South African adults between the ages of 18 and 35 who had a relatively good command of the English language and access to both the Internet and a smart device or computer. No exclusions were made in terms of gender, race, level of education, or occupation. A total of 612 respondents completed the online questionnaire and none were removed from the final sample. Although a few respondents chose not to disclose certain characteristics in the demographic section of

the questionnaire, they were included in the sample and information that was left out was reported as missing data.

### *3.1.2 Demographic data*

The final sample consisted of South African young adults from various social networking sites and students from the University of the Witwatersrand. A majority of the sample (n = 420 (68.6%)) were full-time students; 135 (22.1%) were part-time students, and 57 (9.3%) were not studying at all. A majority of the sample (n = 401 (65.5%) were not employed, 132 (21.6%) were employed full-time, 53 (8.7%) were employed part-time, and 26 (4.2%) indicated that they were self-employed. All participants were aged between 18 and 35, and the average age in the sample was 23.85 years with a standard deviation of 4.83 years.

**Table 3.1**

*Gender Distribution*

| | **Group** | | **N** | **%** |
|---|---|---|---|---|
| | | 1 | **611** | |
| **Gender** | Female | | 456 | 74.5 |
| | Genderfluid | | 1 | .2 |
| | Male | | 143 | 23.4 |
| | Non-binary | | 10 | 1.6 |
| | Transgender | | 1 | .2 |
| | | Missing | 1 | .2 |
| | | Total | 612 | 100 |

For the gender distribution, as illustrated in Table 3.1, 456 (74.5%) of the participants identified themselves as female, 143 (23.4%) identified as male, 10 (1.6%) identified as non-binary, 1 (0.2%) identified as transgender, and 1 (0.2%) identified as genderfluid.

**Table 3.2**

*Racial Distribution*

| | Group | | N | % |
|---|---|---|---|---|
| | | | **608** | |
| **Race** | Asian | | 10 | 1.6 |
| | Black | | 337 | 55.1 |
| | Coloured | | 30 | 4.9 |
| | Indian | | 71 | 11.6 |
| | Mixed | | 2 | .3 |
| | White | | 158 | 25.8 |
| | | Missing | 4 | .7 |
| | | Total | 612 | 100 |

Table 3.2 summarises the racial distribution of the participants in the sample. A majority of the participants (n = 337 (55.1%)) identified their racial group as Black; 158 (25.8%) identified their racial group as White; 71 (11.6%) identified their racial group as Indian; 30 (4.9%) identified their racial group as Coloured; 10 (1.6%) identified their racial group as Asian, and 2 (0.3%) identified their racial group as Mixed.

**Table 3.3**

*Home Language Distribution*

| | Group | | N | % |
|---|---|---|---|---|
| | | | **596** | |
| **Home Language** | Afrikaans | | 28 | 4.6 |
| | English | | 402 | 65.7 |
| | French | | 2 | .3 |
| | isiNdebele | | 2 | .3 |
| | isiXhosa | | 19 | 3.1 |
| | isiZulu | | 61 | 10 |
| | SASL | | 1 | .2 |
| | Sepedi | | 29 | 4.7 |
| | Sesotho | | 16 | 2.6 |
| | Setswana | | 15 | 2.5 |
| | Shona | | 4 | .7 |
| | siSwati | | 3 | .5 |
| | Swahili | | 1 | .2 |
| | Tshivenda | | 1 | .2 |
| | Urdu | | 1 | .2 |
| | Xitsonga | | 11 | 1.8 |
| | | Missing | 16 | 2.6 |
| | | Total | 612 | 100 |

*Note.* SASL = South African Sign Language.

Due to the diversity of the South African population, a variety of home languages were represented in the sample. Table 3.3 shows that 402 (65.7%) participants were

predominantly English-speaking, followed by 61 (10%) participants who indicated that they spoke isiZulu as their home language. Additionally, 29 (4.7%) participants spoke Sepedi, 28 (4.6%) were Afrikaans-speaking, and 19 (3.1%) were isiXhosa-speaking. Another 48 (7.9%) spoke another official South African language, 1 (0.2%) spoke South African Sign Language, and 8 (1.4%) spoke a language not indigenous to South Africa.

**Table 3.4**

*Highest Qualification Distribution*

| | Categories | | N | % |
|---|---|---|---|---|
| | | | **612** | |
| **Highest Qualification** | Some high school | | 7 | 1.1 |
| | NSC/Matric | | 88 | 14.4 |
| | Technical/vocational | | 3 | .5 |
| | Diploma | | 9 | 1.5 |
| | Bachelors/UG | | 296 | 48.4 |
| | PG diploma | | 1 | .2 |
| | Honours | | 99 | 16.2 |
| | Masters | | 92 | 15.0 |
| | Doctorate | | 17 | 2.8 |
| | | Missing | 0 | 0 |
| | | Total | 612 | 100 |

*Note*. NSC = National Senior Certificate; UG = Undergraduate degree; PG = Postgraduate.

Table 3.4 presents the number of participants who indicated that they had completed or were in the process of completing an educational qualification. A majority of the participants (n = 296 (48.4%)) indicated that they had completed or were in the process of completing a Bachelor's-level degree. Another 99 (16.2%) had completed or were in the process of completing an Honours-level degree, 92 (15.0%) had completed or were in the

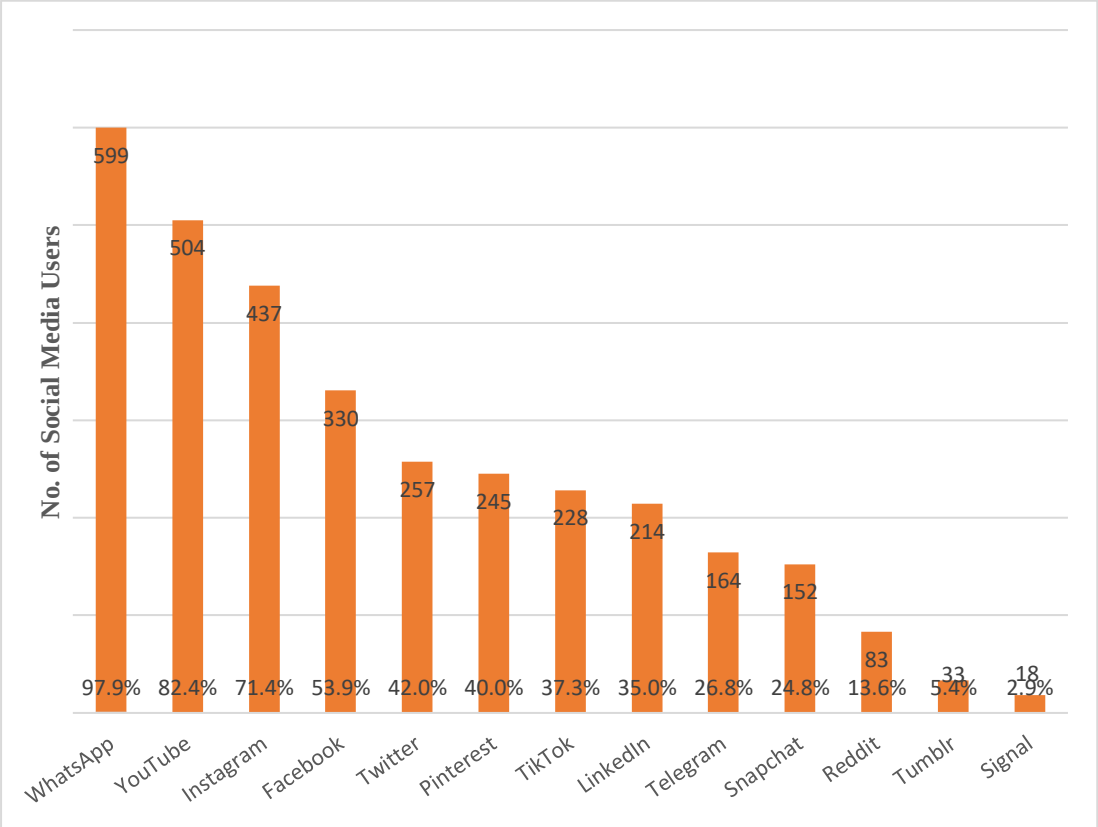
process of completing a Masters-level degree; and 88 (14.4%) had completed or were completing Matric. The remaining categories of Doctorate, postgraduate diploma, diploma, technical, and some high school accounted for 6.1 % of the total sample (n = 37).

### *3.1.3 Social media use*

As shown in Figure 3.1, this study revealed that WhatsApp was the social media app of choice for almost all of the participants in the sample (n = 599 (97.9%)).

**Figure 3.1**

*Types of social media sites used*




In addition, 504 (82.4%) participants indicated that they were active on YouTube, 437 (71.4%) on Instagram, 330 (53.9%) on Facebook, 257 (42.0%) on Twitter, 245 (40.0%) on Pinterest, and 228 (37.3%) on TikTok. Other popular sites used included: LinkedIn (n = 214 (30.0%)), Telegram (n = 164 (26.8%)), Snapchat (n = 152 (24.8%)), Reddit (n = 83 (13.6%)), Tumblr (n = 33 (5.4%)), and Signal (n = 18 (2.9%)). Some participants indicated that they

also used other social media sites or apps such as Discord, Quora, Vlive, Tinder, and Twitch, which accounted for 3.8% of the sample.

**Table 3.5**

*Number of social media apps used*

| | NOSM | | N | % |
|---|---|---|---|---|
| | | | **612** | |
| **Number of social media sites used** | 0 | | 1 | .2 |
| | 1 | | 11 | 1.8 |
| | 2 | | 32 | 5.2 |
| | 3 | | 79 | 12.9 |
| | 4 | | 98 | 16.0 |
| | 5 | | 106 | 17.3 |
| | 6 | | 97 | 15.8 |
| | 7 | | 93 | 15.2 |
| | 8 | | 50 | 8.2 |
| | 9 | | 29 | 4.7 |
| | 10 | | 10 | 1.6 |
| | 11 | | 4 | .7 |
| | 12 | | 1 | .2 |
| | | Missing | 1 | .2 |
| | | Total | 612 | 100 |
| **Deleted/ Deactivated** | | | 98 | 16 |

*Note.* NOSM = Number of social media sites used. SMDEL = Number of participants with deleted social media apps.

Table 3.5 presents a breakdown of the number of social media sites used by each participant and the number of participants who indicated that they had deleted or deactivated at least some of their social media apps at some point in time. A large number of participants (n = 106 (17.3%)) were active on five social media sites. It is also noteworthy that just over 64% of participants used between four and seven social media apps (n = 394 (64.3%)). Moreover, 15 (2.5%) participants were active on ten or more social media apps. Additionally, 98 (16%) participants reported that they had deleted or deactivated some of their social media apps at some point in time and only a single participant in the sample (0.2%) did not use social media apps at all. The average number of social media sites used in the sample was 5.37 with a standard deviation of 4.83; and the maximum number of sites used was twelve.

**Table 3.6**

*Average time spent on social media per day*

| | **ATSMPD** | **N** | **%** |
|---|---|---|---|
| **No. of hours spent on social media** | | **612** | |
| | 0 | 5 | .8 |
| | 0 – 15 mins | 6 | 1.0 |
| | 15 - 30 | 27 | 4.4 |
| | 30 - 1 hour | 54 | 8.8 |
| | 1 - 2 | 103 | 16.8 |
| | 2 - 3 | 120 | 19.6 |
| | 3 - 4 | 108 | 17.6 |
| | 4 - 5 | 85 | 13.9 |
| | 5 - 8 | 58 | 9.5 |
| | 8 - 10 | 28 | 4.6 |
| | >10 hours | 18 | 2.9 |

*Note.* ATSMPD = average time spent on social media per day

Table 3.6 shows the average time spent on social media per day. A total of 103 (16.8%) participants reported spending 1 to 2 hours on social media daily. However, almost 20% (n = 120 (19.6%)) indicated that they spent 2 to 3 hours on social media sites per day and just under 18% (n = 108 (17.6%)) spent 3 to 4 hours per day. Additionally, 58 (9.5%) participants spent 5 to 8 hours and 28 (4.6%) spent 8 to 10 hours on social media per day. A key point to note is that just under one third of the participants in the sample (n = 189 (30.8%)) spent more than 4 hours on social media daily. With reference to the distribution data, the average time spent daily on social media sites had a mean of 5.51 and a standard deviation of 2.0. This suggests that in this sample, the average daily time spent on social media sites was approximately 2 to 3 hours per day. (Please see Appendix K Figure 7.26 for the ATSMPD distribution data).

## 3.2 INSTRUMENTS

With the exception of the self-developed demographic questionnaire, all measurement scales used in this study were publicly available and obtaining written permission to reproduce or copy test content for non-commercial or educational research purposes was not required from the authors. The online survey used in the study consisted of the following instruments:

### *3.2.1 Demographics*

A questionnaire was developed to gather demographic information regarding participant age, gender, race, home language and languages spoken, level of education, employment and study status, occupation, and field of work (if relevant), field and year of study (if relevant), number and types of social networking sites used, and the average amount

of time spent on social networking sites per day. This information was used to describe the characteristics of the sample**.** (Please see Appendix A for the full questionnaire).

### *3.2.2 The Social Networking Addiction Scale (SNAS)*

The Social Networking Addiction Scale (SNAS) is a measurement tool that is used to measure the level of social media addiction for all types of social networking platforms such as Instagram, Facebook, Twitter, or WhatsApp (Shahnawaz & Rehman, 2020). The self-report scale consists of a total of 21 items presented on a 5-point Likert scale ranging from 1 "never" to 5 "always". It measures six factors in line with the behavioural addiction model, namely, "salience, mood modification, tolerance, withdrawal, conflict, and relapse" (Griffiths, 2005, p. 191). The following is a brief description of each of the six factors along with the number of items included in each subscale:

1. Salience: a preoccupation dominating the user's thinking, feeling, and behaviour on social networking sites (4 items). For example, "While I work/study, my mind remains on social networking sites".
2. Mood modification: the intent to alter mood states when engaging on social networking sites (3 items). For example, "Social networking helps me lift my mood".
3. Tolerance: increasing the time spent online in order to satisfy one's "need for a fix" (3 items). For example, "I need to be on social networking sites for a longer time than before to be satisfied".
4. Withdrawal symptoms: developing physical or psychological symptoms when engagement on social networking sites is hindered (4 items). "I become irritable whenever I cannot log in to social networking sites".
5. Conflict: interpersonal and intrapersonal tension that compromises all aspects of life (3 items). For example, "I try to hide the time I spend on social networking".

6. Relapse: failed attempts to control the use of social networking and return to previous patterns of behaviour (4 items). For example, “I have tried to stop using social networking sites, but have failed”.

With reference to the psychometric properties of the scale, Shahnawaz and Rehman (2020) found that each subscale (representing one of the factors) yielded an appropriate composite reliability of more than .70 in a sample of 525 students. The specific composite reliabilities identified for each subscale were: salience (*CR* = .81); mood modification (*CR* = .79); tolerance (*CR* = .78); withdrawal (*CR* = .86); conflict (*CR* = .75); and relapse (*CR* = .89). A high test-retest reliability of .88 and acceptable discriminant and convergent validities were also established. As claimed by Shahnawaz and Rehman (2020), the Social Networking Addiction Scale was positioned as a unique instrument that bridges the gap between Facebook addiction and problematic internet use and it is an all-encompassing tool that can measure addiction to various social networking sites and apps. Given that the scale has not been used in the South African context, this study explored the internal consistency reliability of the scale in the sample. (Please see Appendix B for the full scale).

### *3.2.3 The Depression, Anxiety and Stress Scales (DASS-21)*

The Depression, Anxiety, and Stress Scales (DASS-21) is a self-report screening tool that assesses levels of three mental health dimensions (depression, anxiety, and stress) in both clinical and community settings. Lovibond and Lovibond (1995) specify that the depression subscale assesses symptoms such as hopelessness, a lack of interest in daily life activities, and dysphoria. The anxiety subscale assesses conditions such as having an acute response to fear, while the stress subscale taps symptoms that involve a constant state of arousal and tension and sensitivity to being easily irritated or annoyed. There are two scale forms that both contain three subscales: the full 42-item version and the short 21-item version. In this

study, the short form, DASS-21, was used to obtain the data. The subscale for each dimension in the DASS-21 consists of items that are rated on a 4-point Likert scale ranging from 0 "did not apply to me at all" to 3 "applied to me very much or most of the time*"* (Lovibond & Lovibond, 1995, as cited in Henry & Crawford, 2005). Each subscale consists of 7 items. Some examples of items for each consecutive dimension are as follows: "I felt that life was meaningless"; "I experienced trembling (e.g., in the hands)"; and "I found it difficult to relax".

According to Henry and Crawford (2005), the short form DASS-21 has high internal consistency reliability for the total scale ($\alpha$ = .93) and has been shown to have adequate construct validity. The English version of the DASS as well as other language variations have been validated in many different countries (Foxcroft & Roodt, 2018). Studies conducted in South Africa have made use of the DASS-21, for example, Van Zyl et al. (2017), and Thuynsma and De Beer (2016). More recently, Dreyer and colleagues (2019) performed a DASS-21 validation analysis using the South African workforce. Strong convergent and discriminant validity were observed, with an acceptable internal consistency of at least .70. Thus, in addition to having good reliability, the scale has demonstrated strong construct, convergent, and discriminant validity for use in non-clinical samples in South Africa. (Please see Appendix C for the full scale).

### *3.2.4 The Big Five Inventory (BFI)*

Personality dimensions were measured using the Big Five Inventory (BFI), which is based on the Five Factor Model (FFM) of personality. This scale is a 44-item inventory that assesses an individual on five domains of personality, namely, extraversion (friendly, optimistic, gregarious, and talkative); agreeableness (polite, compassionate, altruistic, trusting, and compliant); neuroticism (erratic, quick-tempered, insecure, and vulnerable);

conscientiousness (diligent, well-organised, goal-oriented, and competent); and openness to experience (original, curious, creative, and forward-thinking). Items in each domain are rated on a 5-point Likert scale ranging from 1 “disagree strongly” to 5 “agree strongly” with reverse scoring applied for some items. The items consist of short phrases with relatively understandable vocabulary (John et al., 2008). “I see myself as someone who is talkative” is an example of the 8-item extraversion subscale (3 of which are reverse-scored). Both 9-item agreeableness and conscientiousness subscales (4 of which are reverse-scored) include items such as, “I see myself as someone who is helpful and unselfish with others” and the latter, “I see myself as someone who does a thorough job”. There are 8 items for the neuroticism subscale (3 of which are reverse-scored) and finally, 10 items for openness to experience (2 of which are reverse-scored), with items such as “I see myself as someone who worries a lot” and “I see myself as someone who is sophisticated in art, music, or literature”, respectively.

According to John and Srivastava (1999), the alpha coefficient was established at a mean of .83 and a validity coefficient of .92 was derived from a confirmatory factor analysis. Furthermore, test-retest reliabilities have been found to vary from .80 to .90, and the internal consistency reliabilities of the BFI subscales have been found to generally range from .75 to .90 with a mean above .80 in North American data. Bell and Njoli (2016) found internal consistency reliability estimates ranging between .79 and .88 for the BFI subscales in a South African sample. Additionally, significant convergent and divergent relationships with the other Big Five measures and peer ratings are two examples of evidence available to support the validity of the scale (John & Srivastava, 1999). (Please see Appendix D for the full scale).

### *3.2.5 The Scale of Motives for Using Social Networking Sites (SMU-SNS).*

The Scale of Motives for Using Social Networking Sites (SMU-SNS is a measure that includes a broad range of reasons for using social networking sites. It consists of 27 items

with nine factors: dating (finding a partner), new friendships (meeting new people and making friends), academic purposes (information seeking for one's studies/work), social connectedness (need for belongingness to one's community), following and monitoring others (keeping a close eye on friends' lives and activities), entertainment (seeking amusing and relaxing content), social recognition (seeking popularity and approval from others such and likes and positive comments), self-expression (expressing one's feelings and opinions) and information (following current news, trends and societal issues).

The items are rated on a 7-point Likert scale ranging from 1 "completely untrue" to 7 "completely true". Each subscale consists of 3 items. The following are examples of items that are included in some of the subscales: "To look for a date"; "To feel connected with people."; "To kill time when I'm bored"; "To check that others like my posts"; and "To be informed about the news".

According to Pertegal et al. (2019), all domains show adequate internal consistency reliability with Cronbach's Alpha values ranging between .77 and .90 and a confirmatory factor analysis confirming a condition fit index (CFI) of .93. To date, the scale does not seem to have been used in the South African context; therefore, internal consistency reliability for the scale was examined in the study. (Please see Appendix E for the full scale).

### *3.2.6 Open-ended Survey Questions.*

A set of seven brief open-ended questions was included to gather participants' perceptions about their involvement with social networking sites and the links between this and their mental health. These questions were based on the study's aims and theoretical framework to support the research and focused on whether the participant used social networking sites, whether this was perceived as important to the participant, what they liked and disliked about social networking sites, how using social networking sites made them feel,

and their perceived level of involvement with social networking sites. Conventional content analysis was used to develop categories and frequencies as a basis for identifying short themes from the data (Hsieh & Shannon, 2005). (Please see Appendix F for the full set of questions).

### 3.3 PROCEDURE

The first step in the study was to obtain ethical clearance (ethics protocol number: H21/07/42) from the University of the Witwatersrand Human Research Ethics Committee (non-medical) and permission to conduct the study from the Faculty of Humanities (Please see Appendix J). The next step was to seek permission from the university registrar to approach students and to request assistance in distributing the online survey to all registered students. This step included distributing an invitation to participate in the study (please see Appendix G) with the participant information sheet attached (please see Appendix H) and the link to the online survey included using the university e-learning system. In addition, the invitation to participate in the study with the participant information sheet attached and the link included were circulated on Facebook community groups, YouTube, Reddit, Telegram groups, WhatsApp, Twitter, LinkedIn, and Signal with a request to forward this to others who might be suitable and interested in participating.

Taking into account the required ethical considerations, the invitation to participate in the study included a link to the online survey that started with a full participant information sheet for the study (please see Appendix I). This sheet, which was also attached to the invitation, included a brief description of the project, informed consent requirements for persons between the ages of 18 and 35, voluntary participation, confidentiality and anonymity, the duration of the questionnaire (estimated to be approximately 20 to 30 minutes), and the researcher's and supervisor's names and contact details.

Once a sufficiently large sample was obtained, the dataset was downloaded and any identifying information (for example, IP addresses) was removed. The anonymised dataset was stored on a password-protected computer and was cleaned and coded in MS Excel© and analysed in IBM SPSS Statistics© v. 28.

## 3.4 ETHICAL CONSIDERATIONS

The principles outlined in the *Singapore Statement on Research Integrity* (2010), integrity, accountability, professional courtesy and fairness, and good stewardship in conjunction with the fourteen professional responsibilities, are fundamental to research integrity. With these in mind, the following ethical standards and procedures for this research study were adhered to:

Permission from both the University of the Witwatersrand Human Research Ethics Committee (non-medical) and the University registrar to approach students to invite them to participate in the study was obtained (ethics protocol number: H21/07/42). The process for giving informed consent for adults (persons 18 years and older) was explained and included in the participant information sheet and the invitation (*HSRC: Code of Research Ethics*, 2021). Participation was completely voluntary, and no individual was prejudiced in any manner if they chose not to participate in the study.

Direct benefits did not apply in this study and the foreseeable risks due to participation were classified as minimal (HREC (Non-Medical) Risk Level Categories, 2020). In the event that concerned participants would have liked to discuss their answers further, a referral to contact the South African Depression and Anxiety Group (SADAG) for free telephonic counselling was given.

The confidentiality and anonymity of each participant were safeguarded—identifiable information such as names and email accounts were not requested and neither was any

identifiable information collected (e.g., IP addresses) linked to the data—this was deleted immediately when the data was downloaded (Drennan, 2020).

The participants were informed that a brief feedback summary of general results would be provided for those who requested this, however, participants were clearly informed that individual feedback could not be given as the data would be anonymous (University of the Witwatersrand, 2020). Participants were also asked for permission to store their data in anonymous electronic form for potential use for future research. The researcher and research supervisor's contact details were provided in the participant information sheet along with a referral to the University of the Witwatersrand Human Research Ethics Committee (non-medical) for possible queries.

Social media litigation is still new in South Africa and at the time of this study, there was no clear ethical framework for researchers entering this field. Since this research study did not involve the direct observation of social media activity and collection of social media data, it was not necessary to consult the terms and conditions for each social media platform. Specifically, only the invitation with the participant information sheet and the link to the online survey were distributed using various social network sites. The ethical standards and procedures pertaining to the research study were applied to the recruitment strategy of several sites such as Google apps, Facebook, Instagram, Twitter, Telegram, WhatsApp, Signal, TikTok, and LinkedIn to name a few. Although only the invitation was posted, any specific conditions for use, such as permissions, was checked for each social media site and adhered to accordingly.

## 3.5 DATA ANALYSIS

The following is a brief explanation of the analyses that were conducted in order to generate answers to the research questions.

Firstly, for the quantitative data, Cronbach Alpha coefficients were calculated to determine internal consistency reliability for each scale and subscale that was used in the study. A measure or instrument is regarded as reliable if the same result is consistently achieved. For instance, if an instrument is supposed to measure a construct (such as success), then the results should be roughly the same each time the measure is administered to the same person or the same group of people (Foxcroft & Roodt, 2018). Although reliability cannot be calculated with absolute accuracy, it can be estimated in a number of ways. According to Krebbs (1987), inter-item reliability is a type of reliability that determines the internal consistency of an instrument based on the extent to which items designed to measure the same underlying idea relate to one another. Internal consistency reliability is estimated using Cronbach's alpha (α)—a Pearson's *r* correlation coefficient—which is calculated on a scale ranging from 0 to 1. For interpretation purposes, George and Mallery (2016, p. 240) provide the following guidelines: "α > .9 = *Excellent*; α > .8 = *Good*; α > .7 = *Acceptable*; α > .6 = *Questionable*; α > .5 = *Poor*; and α< .5 = *Unacceptable*". The authors add that these descriptors and cut-off points are merely guidelines, thus they may be used and interpreted at the discretion of the researcher.

Secondly, frequency distributions and percentages were calculated for all categorical variables measured in the study; and descriptive statistics including the mean (average), standard deviation, range (minimum and maximum scores), skewness and kurtosis values, and histograms were calculated for all continuous variables measured in the study (Salkind, 2012). This was done to describe the characteristics of the sample and to describe the nature of the data collected for the main variables in the study, as well as to answer the first research question in the study regarding the reported levels of social networking addiction and mental health in the sample (Holcomb, 2017). The descriptive statistics also helped to establish

whether the data for the continuous variables could be treated as normally distributed for any parametric analyses (Holcomb, 2017).

There are various ways in which normality of the data can be assessed—these include: skewness and kurtosis values, histograms, and Central Limit Theorem (Mordkoff, 2000). In the study, skewness and kurtosis values were calculated for each scale and subscale. An acceptable normal distribution for each variable was assumed if "the skewness values fell between -1 and 1 and if the kurtosis values fell between -3 and 3" (Bulmer, 1979, p. 63). The shape of the histogram for each scale and subscale (please see Appendix K) was also checked to see how closely this fitted with the standard normal distribution (Bulmer, 1979). According to the Central Limit Theorem, when there is an increase in values in a distribution, it will resemble an approximation of a normal distribution (APA Dictionary of Psychology, 2022). A sample size of 30 or more in each group is thus considered sufficient to assume normality (Marsden & Wright, 2010). In this study, the sample was 612, which was sufficient to allow for normality to be assumed according to the Central Limit Theorem.

Using the methods described above, the majority of the variables in this study that were derived from the scales and subscales were classified as normally distributed. However, a small number of variables were found to not be normally distributed. To address this, both parametric and non-parametric analyses were used to answer some of the research questions; and square-root and square transformations were used to shift the shape of the distributions for some of the skewed variables (Salkind, 2012). Decisions were then made regarding suitable statistical techniques that could be applied to address each research question in the study. For the parametric techniques, other assumptions were taken into account where relevant, such as random and independent sampling, levels of measurement for the variables, normality, linearity, and homogeneity of variance (Howell, 2016; Laher, 2016).

In order to address the second, third, and fifth research questions regarding the nature of the relationships between social networking addiction, mental health, personality, and user motives, Pearson's correlation coefficients ($r$) were used for the relationships between variables that were normally distributed and Spearman's correlation coefficients ($r_s$) were used for the relationships between variables where at least one of the variables was not normally distributed in the study (Kraska, 2021). The general definition of a correlation, as stated by Shober et al. (2018), is a measure of a linear relationship between two continuous variables. That is, when two variables vary in magnitude, they do so either in the same direction as one another, which expresses a positive correlation, or the opposite direction to one another, which expresses a negative correlation (Schober et al., 2018). Some assumptions must be met in order to adequately estimate the strength of the correlation in the population from which the data were sampled: Firstly, the data should be obtained from a representative sample and secondly, both continuous variables should follow a normal distribution (Field, 2018). If this assumption is violated, there are various options to consider addressing this. One option is to transform the variables so that they approach a normal distribution and that their relationships are linearised. A second option is to use a non-parametric alternative. Unlike a Pearson's correlation, a Spearman correlation can be used to analyse nonlinear relationships since it does not require normally distributed data (Schober et al., 2018). Various methods have been put forth by several psychology researchers to assist in the interpretation of correlation coefficients as "*weak*", "*moderate*", or "*strong*" associations. For example, coefficients close to ± .10 can be interpreted as representing a small or weak correlation, coefficients near ± .30 as moderate, and coefficients near ± .50 as strong (Cohen, 1988; Price et al., 2017). The authors add that these cut-off points should be used discreetly as they have the potential to yield subjective and unreliable interpretations. Furthermore, it should be noted that the $p$-value obtained from the test does not reveal information on the

strength to which the two variables are associated. Very weak correlation coefficients can be "statistically significant" with large datasets (Schober et al., 2018).

In order to address the fourth and sixth research questions in the study, moderated multiple regressions were conducted using Hayes Process Macro Model 1in IBM SPSS Statistics© (Hayes, 2015). Firstly, Fritz and Arthur (2017) explain that a third variable in research studies is referred to as a moderator variable when the strength of the relationship between two other variables depends on its value. Specifically, the value of the moderator variable determines the magnitude and the direction of the relationship between one variable, commonly referred to as a predictor, and a second variable, typically referred to as an outcome. Moderator variables show the degree to which relationships between variables depend on various forms, such as personality, environmental, and contextual features (Fritz & Arthur, 2017). Secondly, the Process macro, which was used in this study, is useful for analysing a variety of models with moderation based on regression (Ponchio & Correio, 2018). As specified by Hayes (2017, p. 208), "The effect of an independent variable X on a dependent variable Y is moderated by the variable M if its size, sign or strength depends on or can be predicted by M. In that case, M is said to be a moderator of X's effect on Y or that X and M interact in their influence on Y". As a result, it is standard procedure to probe any evidence of moderation by estimating and running a statistical test of the conditional effect of the independent variable at various values of the moderator variable (Igartua & Hayes, 2021). All interactions can be examined to determine the statistical significance of the moderation effects (Field, 2018). Thereafter, the moderators can be dichotomised in order to examine the effects of the independent variables for the two groups that the moderators define (Igartua & Hayes, 2021). This process is known as an analysis of simple slopes, which further facilitates the interpretation of the moderation effects (Aiken & West, 1991; Spiller et al., 2013).

In order to determine whether any of the moderators—personality or user motives—significantly moderated the associations between social networking addiction and mental health, hierarchical moderated regression models were employed for this study. A simple slopes analysis was conducted to identify the type of interaction in cases where there was a significant interaction. All of the main predictor variables entered into the regression models were centred (Fein et al., 2021). Several techniques were used to ensure that the assumptions of multiple regression, including linearity, measurement scales, homoscedasticity, normality, and multicollinearity, were not violated (Osborne & Waters, 2003). Linearity and homoscedasticity were checked using scatterplots and normal probability plots, since in linear models, the dependent variable should have a linear relationship with the predictor variables, the residual variance ought to be constant, and the data should be free from outliers (Draper & Smith, 1998; Tabachnick & Fidell, 2013). With the exception of a dichotomous variable that was entered as a dummy variable, all other variables obtained from the scales were treated as interval variables (Field, 2018). Furthermore, the normality of the data was checked using Central Limit Theorem, skewness and kurtosis estimates, histograms, and normal probability plots, after which various issues were addressed using transformations and dichotomisation (Field, 2018). Specifically, three subscales in the Scale for Motives for Using Social Networking Sites (SMU-SNS) subscales: dating, social recognition, and information, were skewed. To adjust for this, two of the subscales, social recognition and information, were transformed using a square root and square transformation respectively (Osborne & Waters, 2003). Attempts to transform the dating variable were unsuccessful and this variable was therefore converted into a dichotomous variable and entered as a "dummy variable" in the regression model (Draper & Smith, 1998).

Additionally, multicollinearity was checked using tolerance, the variance inflation factor (VIF), and the condition index to determine whether the correlations between the

independent variables were exceptionally high (Baron & Kenny, 1986). To demonstrate that multicollinearity is not a threat in regression models, tolerance values typically should be above 0.1, VIF values should not exceed 5, and the condition index should be below 30 (Alin, 2010; Daoud, 2017; Tabachnick & Fidell, 2013). Moreover, autocorrelation of errors was checked using a Durbin-Watson statistic (Field, 2018; Verma & Abdel-Salam G., 2019). As a general rule, perfect independence occurs when the statistic has a value of 2, which typifies no autocorrelation between the variables; values between 1 and 3 are usually considered to indicate that autocorrelation is not a concern in the model (Field, 2018). The independence of observations assumption is supported by demonstrating that the model has no problems with autocorrelation. Lastly, the number of predictive variables is typically taken into account while determining the sample size. It is widely acknowledged that for regression analysis, the number of independent variables in the model should be multiplied by 10 (Howell, 2016). Since this rule is not supported by empirical evidence, several researchers have come up with a number of alternate solutions (Daoud, 2017; Draper & Smith, 1998; Montgomery et al., 2013; Verma & Abdel-Salam, 2019). For instance, Harris (1985, as cited in Howell, 2016) proposed that the sample size should exceed the predictor variable ($p$) by at least 50 observations ($N \geq p + 50$). The models in this study include two predictor variables, the interaction term, and 611 observations. This establishes a sufficient number of observations relative to the number of variables which supports the assumption of sample sizes.

Qualitative data about participants' perceptions of using social networking sites was also collected from the open-ended questions in the survey. This data was analysed using conventional content analysis (Hsieh & Shannon, 2005), with a focus on identifying themes related to three of the questions asked: how using social networking sites made participants feel, whether using social networking sites ever made participants feel unhappy or anxious,

and whether participants ever felt that they were too involved with social networking sites. Conventional content analysis was appropriate because it is "grounded in the actual data" (Hsieh & Shannon, 2005, p. 1280) and allowed the researcher to capture participants' perspectives in their own words—this was in line with the phenomenological approach adopted by the study (Hsieh & Shannon, 2005; Teherani et al., 2015).

To analyse the responses to these questions, data coding in MS Excel© was carried out to identify categories related to brief themes as well as frequencies associated with these categories. The initial categories were then organised into clusters to identify trends in the data (Hsieh & Shannon, 2005). These clusters were then reviewed and organised into themes for discussion, including selecting quotes to capture participants' voices in expressing these themes (Figgou & Pavlopoulos, 2015). With reference to the above, such meaning-focused techniques place an emphasis on understanding the participants' own subjective interpretations of their experiences and life circumstances (Fossey et al., 2002).

In order to enhance the rigour of the analysis from the phenomenological perspective, a focus on authenticity and reflexivity were necessary. Firstly, two principal issues pertaining to the quality and trustworthiness of qualitative research are whether participants' perspectives have been accurately and authentically reflected in the analysis together with the interpretations drawn from the data collected, and whether the findings match the data and context from which they were obtained (Assarroudi et al., 2018; Fossey et al., 2002). Thus, authenticity of the data was established through using verbatim quotes that served as the foundation for the categories and as a means of support for each interpretation, as well as a way in which to directly allow participants to voice their own thoughts and experiences. In order to keep the interpretations as closely as possible to the original data and, to the greatest extent possible, to avoid changing any intended meanings, care was taken to ensure that all perspectives reflected in the data were preserved and represented in the categories generated.

In terms of the researcher's role in this process, the mastery of continuous reflexivity is a necessity. Reflexivity, as defined by Olmos-Vega et al. (2022, p. 2) "is a set of continuous, collaborative, and multifaceted practices through which researchers self-consciously critique, appraise, and evaluate how their subjectivity and context influence the research processes". This calls for the researcher to become mindful of biases and prejudices and to reflect on their role, actions, and emerging insights and understandings (Fossey et al., 2002). As a researcher, I consciously had to reflect on how my initial understandings of social networking use and its connection to mental health changed through the research process and on how my interpretations and understandings of the data might have influenced the process of analysing the data. As a mature woman and mother of a 25-year-old, I had observed over the years how people tended to clutch onto their phones in the streets, at restaurants, classroom settings, and meeting places. I was also introduced to the term "nomophobia" (short for no-mobile-phone-phobia) which is essentially a fear of not having a phone in one's possession (Griffiths & Kuss, 2017) and after having watched most of the documentaries on the addictive products social media giants have been continuously creating by design in order to maximise profits, I gradually distanced myself from most social media platforms. As a woman whose age precludes me from having grown up with technology and social media as an integral part of my life, I am able to conceptualise the pitfalls of it with greater clarity than an individual who has never known the absence of it. In the same vein, however, my understanding of how social media may be beneficial to one's lifestyle is largely theoretical, and can likely never be internalised or understood to its full extent. In order to prevent my own views on social networks from influencing the study outcomes or adding bias, I worked reflexively throughout the data collection and analysis process. Oftentimes, I was concerned about whether I would be capable of fully empathising with my participants as I believed that some of them were not being entirely honest, particularly with the extent of their involvement

with social networks. My awareness of my prejudices, stereotypes, and unconscious subjectivities helped me to recognise how they might have impacted the way I analysed and reported the study's results. I was also mindful of not being able to relate to the participants who were younger than myself and closer to my daughter's age, and I therefore needed to guard against using their experiences too superficially throughout the analysis. I felt that a rigorous process of ongoing self-reflection benefitted the data analysis process, since it helped me become aware of my personal prejudices and how they might have influenced my reporting. It was also necessary to receive feedback from my supervisor for further insight and to look for biases that could have affected my understanding and proper representation of the information given. The entire reflexive process allowed me to evaluate my role in the analysis procedure, therefore improving the overall credibility of the study. Other specific steps linked to reflexivity are keeping a self-reflexive journal throughout the research process and also keeping an audit trail (a record of all steps and decisions taken throughout the research process (Fossey et al., 2002). Therefore, it was necessary to reflect on the qualitative analytic and interpretation process, as well as keep memos to record and examine decisions, and build on analytically insightful moments, throughout the study.

This study qualified as mixed-methods research due to its combination of quantitative and qualitative components. As such, the final steps in the data analysis involved the integration of the two distinct types of data to compare the results in a narrative discussion. This discussion assists in identifying similarities and differences between the two sets of findings in order to provide a rich, comprehensive response to the research questions. This process makes it possible to show how the qualitative data supports, contradicts, or adds to the quantitative findings (Creswell & Clark Plano, 2017).

## 3.6 CONCLUSION

This chapter discussed the study's mixed methods research design and the quantitative and qualitative strategies that were employed to collect data to answer the research questions. Specifically, the design features, sampling strategies and sample, demographic data for the participants, instruments used, important procedures and steps taken to collect data, ethical considerations, and data analysis relevant to the study were presented and discussed. In the next chapter, the quantitative statistical results are reported followed by findings from the qualitative analysis.

# CHAPTER 4

# 4 RESULTS

The results of the analyses performed to address the research questions in the study are reported in this chapter. IBM SPSS Statistics© v. 28 was used to generate data for internal consistency reliability**,** descriptive statistics, transformations, and normality. This was followed by calculations for Pearson's and Spearman's correlations and moderation analysis using Hayes Process Macro Model 1 v. 4.1. The final section presents the findings from the qualitative data that was gathered and interpreted using conventional content analysis.

## 4.1 Internal consistency reliability

Cronbach Alpha coefficients were calculated for each scale and subscale used in the study in order to establish the internal consistency reliability of these in the sample (Cronbach, 1951)**.** The results for these calculations are reported in the sections below.

### *4.1.1 Internal consistency reliability for the Social Networking Addiction Scale (SNAS)*

As shown in Table 4.1, the overall score for the Social Networking Addiction Scale ($\alpha$ = .928) had excellent internal consistency reliability in the sample. Equally, both of its subscales withdrawal ($\alpha$ = .911) and relapse ($\alpha$ = .918) had high reliability coefficients and thus excellent internal consistency reliability. The tolerance subscale ($\alpha$ = .829) had good internal consistency reliability in the sample; while the subscales salience ($\alpha$ = .763)*,* mood modification ($\alpha$ = .754)*,* and conflict ($\alpha$ = .710) had acceptable internal consistency reliability in the sample. Overall, the results indicated that the Social Networking Addiction Scale (SNAS) and its subscales could be considered reliable in the study.

**Table 4.1**

*Internal consistency reliability for the Social Networking Addiction Scale (SNAS)*

| | n | Variable | No. of items | Cronbach's alpha (α) |
|---|---|---|---|---|
| **Scale** | 612 | SNAS total | 21 | .928 |
| **Subscales** | | Salience | 4 | .763 |
| | | Mood modification | 3 | .754 |
| | | Tolerance | 3 | .829 |
| | | Withdrawal | 4 | .911 |
| | | Conflict | 3 | .710 |
| | | Relapse | 4 | .918 |

*Note.* SNAS = the Social Networking Addiction Scale.

### *4.1.2 Internal consistency reliability for the Depression, Anxiety and Stress Scales (DASS-21)*

**Table 4.2**

*Internal consistency reliability for the DASS-21*

| | n | Variable | No. of items | Cronbach's alpha (α) |
|---|---|---|---|---|
| **Scale** | 612 | DASS-21 total | 21 | .940 |
| **Subscales** | | Depression | 7 | .915 |
| | | Anxiety | 7 | .829 |
| | | Stress | 7 | .846 |

*Note.* DASS-21 = the Depression, Anxiety, and Stress Scales.

As shown in Table 4.2, the Cronbach Alpha coefficient for the depression subscale (α = .915) indicated that this had excellent internal consistency reliability and the Cronbach Alpha coefficients for the anxiety (α = .829) and stress (α = .846) subscales indicated that these had good internal consistency reliability. The DASS-21 total score (α = .940) also had excellent internal consistency reliability due to strong inter-relationships among the items.

### *4.1.3 Internal consistency reliability for the Big Five Inventory (BFI)*

Internal consistency for all dimensions of the BFI was satisfactory in the sample, with Cronbach Alpha coefficient values ranging between .69 and .82.

**Table 4.3**

*Internal consistency reliability for the Big Five Inventory (BFI)*

| | n | Variable | No. of items | Cronbach's alpha (α) |
|---|---|---|---|---|
| **Scale** | 612 | BFI total | 44 | |
| **Subscales** | | Extraversion | 8 | .820 |
| | | Agreeableness | 9 | .726 |
| | | Conscientiousness | 9 | .790 |
| | | Neuroticism | 8 | .812 |
| | | Openness | 10 | .691 |

*Note.* BFI = the Big Five Inventory

As shown in Table 4.3, the extraversion (α = .820) and neuroticism (α = .812) subscales had good internal consistency reliability and the conscientiousness (α = .790) and agreeableness (α = .726) subscales had acceptable internal consistency reliability. Although the Cronbach Alpha coefficient was slightly lower than .7 for the openness subscale (α

= .691), this was sufficiently close to the cut-off for acceptable internal consistency reliability to be considered acceptable in the sample (Schober et al., 2018).

### *4.1.4 Internal consistency reliability for the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

As shown in Table 4.4., the Scale of Motives for Using Social Networking Sites (SMU-SNS) subscales had Cronbach Alpha coefficient values ranging between .79 and .94 in the sample.

**Table 4.4**

*Internal consistency reliability for the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

| | n | Variable | No. of items | Cronbach's alpha (α) |
|---|---|---|---|---|
| **Scale** | 612 | SMU-SNS total | 27 | |
| **Subscales** | | Dating | 3 | .854 |
| | | New Friendships | 3 | .939 |
| | | Academic Purposes | 3 | .906 |
| | | Social Connectedness | 3 | .867 |
| | | Following and Monitoring Others | 3 | .792 |
| | | Entertainment | 3 | .862 |
| | | Social Recognition | 3 | .823 |
| | | Self-expression | 3 | .871 |
| | | Information | 3 | .847 |

*Note.* SMU-SNS = the Scale of Motives for Using Social Networking Sites

Overall, the scale demonstrated satisfactory internal consistency reliability in the sample. New friendships ($\alpha$ = .939) and academic purposes ($\alpha$ = .906) yielded the strongest Cronbach Alpha coefficients (representing excellent internal consistency reliability), followed by self-expression ($\alpha$ = .871), social connectedness ($\alpha$ = .867), entertainment ($\alpha$ = .862), dating ($\alpha$ = .854), information ($\alpha$ = .847), social recognition ($\alpha$ = .823), which had good internal consistency reliability. The Cronbach Alpha coefficient for the following and monitoring others subscale ($\alpha$ = .792) indicated that this had acceptable internal consistency reliability in the sample.

## 4.2 Descriptive statistics

In addition to the demographic characteristics described in Chapter 2, descriptive statistics were calculated for each scale with its related set of subscales to determine their averages, variabilities, and the general shapes of their distributions (Holcomb, 2017; Kaur et al., 2018). This included calculating means, medians, standard deviations, minimum and maximum scores, and skewness and kurtosis values. In instances where categorical data was obtained, frequencies and percentages were calculated to describe the data (Fisher & Marshall, 2009).

### *4.2.1 Descriptive statistics for the Social Networking Addiction Scale (SNAS)*

As shown in Table 4.5, the total social networking addiction score had a mean of 53.31 and a standard deviation of 16.66 in the sample, with scores ranging between 21 and 102. This, along with the histogram (please see Appendix K), suggested a wide dispersion of the data with slightly more respondents positioned towards the lower levels of social networking addiction compared to those positioned towards the higher levels of social networking addiction. The skewness and kurtosis estimates and histogram also indicated that

the data for the total social networking addiction score could be treated as normally distributed in the sample.

**Table 4.5**

*Social Networking Addiction Scale (SNAS): Descriptive statistics (n = 611)*

| SNAS | Mean | Median | SD | Skewness | Kurtosis | Min. | Max. |
|---|---|---|---|---|---|---|---|
| **SNAS Total** | 53.31 | 51.00 | 16.66 | 0.51 | -0.25 | 21 | 102 |
| **Salience** | 12.20 | 12.00 | 3.70 | -0.13 | -0.58 | 4 | 20 |
| **Mood Modification** | 9.28 | 9.00 | 2.98 | 0.09 | -0.59 | 3 | 15 |
| **Tolerance** | 8.55 | 8.00 | 3.35 | 0.15 | -0.91 | 3 | 15 |
| **Withdrawal** | 8.77 | 8.00 | 4.47 | 0.79 | -0.31 | 4 | 20 |
| **Conflict** | 5.54 | 5.00 | 2.81 | 1.20 | 0.84 | 3 | 15 |
| **Relapse** | 8.96 | 8.00 | 4.54 | 0.80 | -0.28 | 4 | 20 |

*Note.* SNAS = Social Networking Addiction Scale.

Of the six subscales in the Social Networking Addiction Scale, the salience subscale had the highest mean score ($M$ = 12.20; $SD$ = 3.70; range: 4-20) and the conflict subscale had the lowest mean score in the sample ($M$ = 5.54; $SD$ = 2.81; range: 3-15). Further, the means for the other subscales were as follows: mood modification ($M$ = 9.28; $SD$ = 2.98; range: 3-15), tolerance ($M$ = 8.55; $SD$ = 3.35; range: 3-15), withdrawal ($M$ = 8.77; $SD$ = 4.47; range: 4-20) and relapse ($M$ = 8.96; $SD$ = 4.54; range: 4-20).

The skewness estimate for the conflict subscale was above the cut-off point of 1 — this, along with the histogram (please see Appendix K), indicated that the data for this

subscale was positively skewed in the sample. Skewness and kurtosis estimates, the histograms (please see Appendix K), and sample size indicated that the data for the other subscales could be treated as normally distributed in the sample.

For the social networking addiction data, the total scores (n = 611 (98.8%)) were also classified into two categories of 84 or less (representing lower social networking addiction) and 85 or more (representing higher social networking addiction). The cut-off point to determine higher levels of social networking addiction was derived on the basis of the assigned values of the questionnaire's five-point Likert scale, in this case, 1 = *Never*; 2 = *Rarely*; 3 = *Sometimes*; 4 = *Often*, and 5 = *Always*. Only respondents who answered "*always*" for at least one item in the questionnaire were able to obtain an overall score of 85 or more — this was treated as an expression of higher levels of social networking addiction. The results revealed that 581 (94.9%) respondents in the sample scored 84 or less, indicating lower levels of social networking addiction; while 30 (4.9%) respondents scored 85 and above indicating higher levels of social networking addiction.

### *4.2.2 Descriptive statistics for the Depression, Anxiety, and Stress Scale (DASS-21)*

As shown in Table 4.6, the total score for the DASS-21 produced a mean of 23.43, and a standard deviation of 15.34. Moreover, the minimum and maximum scores for the scale were 0 and 63 respectively (the established maximum score of the DASS-21 is 63). This, together with the histogram (please see Appendix K), indicated that a majority of the respondents in the sample reported having moderate levels of overall mental health problems with only a small number reporting having a very high level of these.

**Table 4.6**

*Depression, Anxiety, and Stress Scale-21 (DASS-21): Descriptive statistics (n = 612)*

| DASS-21 | Mean | Median | SD | Skewness | Kurtosis | Min. | Max. |
|---|---|---|---|---|---|---|---|
| **DASS-21 Total** | 23.43 | 21.00 | 15.34 | 0.44 | -0.72 | 0 | 63 |
| **Depression** | 8.04 | 7.00 | 6.26 | 0.49 | -0.98 | 0 | 21 |
| **Anxiety** | 6.72 | 6.00 | 5.32 | 0.68 | -0.37 | 0 | 21 |
| **Stress** | 8.67 | 8.00 | 5.38 | 0.26 | -0.86 | 0 | 21 |

*Note.* DASS-21 = the Depression, Anxiety, and Stress Scale

Despite this, the spread of the data showed evidence of mental health problems with symptoms of depression, anxiety, and stress. The skewness and kurtosis estimates, histogram, and sample size (for Central Limit Theorem) also indicated that the data for the total DASS-21 score could be treated as normally distributed in the sample (Kaur et al., 2018; Lund, 2013).

The mean score for depression in the sample was 8.04 with a standard deviation of 6.26; the mean score for anxiety was 6.72 with a standard deviation of 5.32; and the mean score for stress was 8.67 with a standard deviation of 5.38 (with a minimum score of 0 and a maximum score of 21 for each subscale). The skewness and kurtosis estimates, histograms (please see Appendix K), and sample size indicated that the data for these subscales could be treated as normally distributed in the sample (Lund, 2013).

For the mental health data (n = 612 (100%)), five distinct levels of depression, anxiety, and stress were also established as per the categories identified by Lovibond and Lovibond (1995) in the '*Manual of the Depression Anxiety & Stress Scales*'.

For the depression subscale, the five classification levels are: *normal* (0-4); *mild* (5-6); *moderate* (7-10); *severe* (11-13); and *extremely severe* (14 and above). The results showed that a large number of the participants reported having normal levels of symptoms connoting no signs of depression (n = 238 (38.9%)), and a further 55 participants (9.0%) reported experiencing only mild depression. It was, however, concerning that 114 participants (18.6%) reported experiencing moderate levels of depression, 58 participants (9.5%) reported experiencing severe levels of depression, and almost a quarter of the sample (n = 147 (24.0%)) reported experiencing extremely severe depression.

For the anxiety subscale, the five classification levels are: *normal* (0-3); *mild* (4-5); *moderate* (6-7); *severe* (8-9); and *extremely severe* (10 and above). One-third of the sample reported normal levels of anxiety (n = 206 (33.7%)). Furthermore, 97 participants (15.8%) reported having mild anxiety, 64 participants (10.5%) reported having moderate anxiety, and 76 participants (12.4%) reported having severe anxiety. A relatively large proportion of the sample reported having extremely severe anxiety (n = 169 (27.6%)).

For the stress scale, the five classification levels are: *normal* (0-7); *mild* (8-9); *moderate* (10-12); *severe* (13-16); and *extremely severe* (17 and above). Almost half of the sample reported having normal levels of stress (n = 289 (47.2%)). Another 58 participants (9.5%) experienced mild stress, 109 participants (17.8%) experienced moderate stress, and 105 participants (17.2%) experienced severe stress. Only a small portion of the sample (n = 51 (8.3%)) reported having extremely severe stress.

### *4.2.3 Descriptive statistics for the Big Five Inventory (BFI)*

**Table 4.7**

*Big Five Inventory (BFI): Descriptive statistics (n = 612)*

| BFI | Mean | Median | SD | Skewness | Kurtosis | Min. | Max. |
|---|---|---|---|---|---|---|---|
| **Extraversion** | 23.05 | 22.00 | 6.73 | 0.28 | -0.29 | 8 | 40 |
| **Agreeableness** | 33.39 | 33.00 | 5.92 | -0.33 | -0.09 | 11 | 45 |
| **Conscientiousness** | 31.36 | 32.00 | 6.50 | -0.28 | -0.10 | 11 | 45 |
| **Neuroticism** | 25.67 | 26.00 | 6.72 | -0.17 | -0.40 | 8 | 40 |
| **Openness** | 35.60 | 36.00 | 5.96 | -0.32 | -0.16 | 17 | 50 |

*Note.* BFI = the Big Five Inventory

Table 4.7 shows descriptive data for the five dimensions of the Big Five Inventory (BFI). Respondents reported having moderate to high agreeableness scores relative to the mean ($M$ = 33.39), standard deviation ($SD$ = 5.92), and minimum and maximum scores of 11 and 45. Similarly, openness to experience generated a mean of 35.60 and a standard deviation of 5.96, with a minimum score of 17 and a maximum score of 50, suggesting moderately high levels of openness in the sample. Conscientiousness produced a similar pattern with a mean of 31.36, a standard deviation of 6.50, and minimum and maximum scores of 11 and 40. Furthermore, the reported levels of extraversion ($M$ = 23.05; $SD$ = 6.73; range: 8-40) and neuroticism ($M$ = 25.67; $SD$ = 6.72; range: 8-40) were moderate in the sample although a few respondents obtained maximum scores for these subscales. Skewness and kurtosis estimates for all five dimensions were in the acceptable range (none of the skewness estimates were greater than 1 or less than -1 and none of the kurtosis estimates were greater than 3 or less than -3) and, together with the histograms (please see Appendix K), indicated that a normal distribution for each dimension could be assumed.

### *4.2.4 Descriptive statistics for the Scale for Motives for Using Social Networking Sites (SMU-SNS)*

The Scale for Motives for Using Social Networking Sites (SMU-SNS) has nine types of motive for using social networking sites, namely: dating, new friendships, academic purposes, social connectedness, following and monitoring others, entertainment, social recognition, self-expression, and information. Descriptive statistics provided in Table 4.8 were calculated to explore the respondents' motives for using social networking sites in the sample.

**Table 4.8**

*The Scale for Motives for Using Social Networking Sites (SMU-SNS): Descriptive statistics (n = 612)*

| SMU-SNS | Mean | Median | SD | Skewness | Kurtosis | Min. | Max. |
|---|---|---|---|---|---|---|---|
| **Dating** | 5.57 | 3.00 | 4.12 | 1.77 | 2.38 | 3 | 21 |
| **New Friendships** | 9.13 | 8.00 | 5.78 | 0.55 | -0.98 | 3 | 21 |
| **Academic Purposes** | 15.10 | 16.00 | 5.58 | -0.74 | -0.53 | 3 | 21 |
| **Social Connectedness** | 13.84 | 15.00 | 5.35 | -0.39 | -0.88 | 3 | 21 |
| **Following and Monitoring Others** | 11.86 | 12.00 | 5.37 | -0.05 | -1.02 | 3 | 21 |
| **Entertainment** | 16.18 | 17.00 | 4.63 | -0.94 | 0.18 | 3 | 21 |
| **Social Recognition** | 6.93 | 5.00 | 4.61 | 1.23 | 0.65 | 3 | 21 |
| **Self-Expression** | 11.08 | 11.00 | 5.72 | 0.15 | -1.13 | 3 | 21 |
| **Information** | 17.32 | 18.00 | 4.17 | -1.28 | 1.30 | 3 | 21 |

Dating had the lowest mean score in the sample ($M$ = 5.57) with a standard deviation of 4.12, a minimum value of 3, and a maximum value of 21. Moreover, the skewness coefficient and histogram (please see Appendix K) revealed that dating had a positively

skewed distribution in the sample with many respondents in the sample reporting dating scores that were relatively low. In the same manner, the skewness coefficient and histogram (please see Appendix K) indicated that social recognition ($M$ = 6.93; $SD$ = 4.61; range: 3-21) was positively skewed in the sample. In contrast, the highest mean score was recorded for information ($M$ = 17.32) with a standard deviation of 1.47, a minimum score of 3, and a maximum score of 21. The skewness coefficient and histogram (please see Appendix K) indicated that information had a negatively skewed distribution in the sample, with many respondents reporting information scores that were relatively high. Dating, social recognition, and information were therefore treated as having non-normal distributions in the sample.

Relative to the range of possible scores for each motive (range: 3-21), the average scores for academic purposes ($M$ = 15.10; $SD$ = 5.58), entertainment ($M$ = 16.18; $SD$ = 4.63), and social connectedness ($M$ = 13.84; $SD$ = 5.35) suggested a spread of scores leaning towards the higher end of the distribution while new friendships ($M$ = 9.13; $SD$ = 5.78), following and monitoring others ($M$ = 11.86; $SD$ = 5.37), and self-expression ($M$ = 11.08; $SD$ = 5.72) suggested moderate levels of each type of motive in the sample. The skewness and kurtosis estimates and histograms (please see Appendix K) indicated that each of these motives could be treated as having a normal distribution in the sample.

### 4.3 Correlations

Correlations were calculated to answer the second, third, and fifth research questions in the study regarding the nature of the relationships between levels of social networking addiction, mental health, personality, and user motives in the sample. Pearson's correlation coefficients were calculated in all cases where the nature of the data supported running a parametric analysis (Schober et al., 2018). In instances where some subscales were found to

be skewed and produced non-normal distributions, Spearman's Rank Order correlations were performed (de Winter et al., 2016).

### *4.3.1 Correlations between social networking addiction and mental health*

In order to answer the second research question in this study regarding the nature of the relationships between social networking addiction and mental health, correlations were calculated to represent the relationships between the variables measured by the Social Networking Addiction Scale (SNAS) and the Depression, Anxiety and Stress Scales (DASS-21). Pearson's correlation coefficients were calculated for relationships between the DASS-21 depression, anxiety, and stress subscales and the total score for the SNAS, as well as five of the six SNAS subscales (salience, mood modification, tolerance, withdrawal, and relapse). The sixth SNAS subscale, conflict, had a skewed distribution in the sample and Spearman's Rank-Order correlation coefficients were therefore calculated for the relationships between this subscale and the DASS-21 subscales instead.

**Table 4.9**

*Pearson's correlation coefficients for the Social Networking Addiction Scale (SNAS) and the Depression, Anxiety, and Stress Scales (DASS-21)* (N = 611*)*

| Variable | Salience | Mood modification | Tolerance | Withdrawal | Relapse | SNAS-Total |
|---|---|---|---|---|---|---|
| **Depression** | .269*** | .245*** | .253*** | .256*** | .328*** | .369*** |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 |
| **Anxiety** | .248*** | .244*** | .187*** | .219*** | .281*** | .317*** |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 |
| **Stress** | .254*** | .235** | .221*** | .280*** | .318*** | .359*** |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 |
| **DASS-Total** | .285*** | .267*** | .245*** | .279*** | .343*** | .386*** |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 |

****p < .01 (two-tailed).*

Table 4.9 presents the Pearson's correlation coefficients that were calculated to establish the nature of the relationships between social networking addiction and mental health. Overall, these correlations were significant, weak to moderate, and positive in nature.

The total score for social networking addiction was significantly, moderately, and positively related to depression ($r$ = .369**,** $p$ < .001), anxiety ($r$ = .317 $p$ < .001**),** stress ($r$ = .359, $p$ < .001**),** and the DASS-21 total score ($r$ = .386, $p$ < .001). Salience was found to be positively, weakly, and significantly related to depression ($r$ = .269, $p$ < .001), anxiety ($r$ = .248 $p$ < .001), and stress ($r$ = .254, $p$ < .001), and to the DASS-21 total ($r$ = .285, $p$ < .001). Mood modification also had a significant, positive, and weak relationship with depression ($r$ = .245, $p$ < .001), anxiety ($r$ = .244, $p$ < .001), stress ($r$ = .235, $p$ < .001), and the total DASS-21 score ($r$ = .267, $p$ < .001). Tolerance had significant, positive, and weak relationships with depression ($r$ = .253, $p$ < .001), anxiety ($r$ = .187, $p$ < .001), stress ($r$ = .221, $p$ < .001), and the DASS-21 total score ($r$ = .245, $p$ < .001). Furthermore, withdrawal had significant, positive, and weak relationships with depression ($r$ = .256, $p$ < .001), anxiety, ($r$ = .219, $p$ < .001), stress ($r$ = .280, $p$ < .001), and the DASS-21 total score ($r$ = .279, $p$ < .001). Lastly, relapse had significant, positive, and moderate relationships with depression ($r$ = .328, $p$ < .001), stress ($r$ = .318 $p$ < .001), and the DASS-21 total score ($r$ = .343, $p$ < .001), and a significant, positive, and weak relationship with anxiety ($r$ = .281, $p$ < .001).

**Table 4.10**

*Spearman's Rank Order correlation coefficients for the conflict subscale of the Social Networking Addiction Scale (SNAS) and the Depression, Anxiety, and Stress Scales (DASS-21)* (N = 611*)*

| Variable | Depression | Anxiety | Stress | DASS-Total |
|---|---|---|---|---|
| **Conflict** | .347*** | .257*** | .324*** | .349*** |
| | < .001 | < .001 | < .001 | < .001 |

****p < .01 (two-tailed).*

As shown in Table 4.10, the Spearman's Rank Order correlation between the conflict subscale of the SNAS and the total score for the DASS-21 was significant, positive, and moderate ($r_s = .349$, $p < .001$). The conflict subscale was also significantly, positively, and moderately related to depression ($r_s = .347$, $p < .001$) and stress ($r_s = .324$, $p < .001$) and was significantly, positively, and weakly related to anxiety ($r_s = .257$, $p < .001$).

Therefore, every aspect of social networking addiction was found to be significantly and positively related to every aspect of mental health (depression, anxiety, and stress) in the sample, suggesting that as symptoms of social network addiction increased, symptoms of poorer mental health (more depression, anxiety, and stress) increased as well.

### *4.3.2 Correlations between personality, social networking addiction, and mental health*

In order to answer the third research question in this study regarding the nature of the relationships between personality, social networking addiction and mental health, correlations were calculated to represent the relationships between the variables measured by the Big Five Inventory (BFI), the Social Networking Addiction Scale (SNAS), and the Depression, Anxiety, and Stress Scales (DASS-21). Firstly, Pearson's correlation coefficients were calculated for relationships between the BFI extraversion, agreeableness, conscientiousness, neuroticism, and openness subscales and the total score for the SNAS, as well as five of the six SNAS subscales (salience, mood modification, tolerance, withdrawal, and relapse). Thereafter, Spearman's Rank-Order correlation coefficients were calculated for the relationships between the sixth SNAS subscale, conflict, and the BFI subscales. Lastly, correlations between the subscales measured by the Depression, Anxiety, and Stress Scales (DASS-21) and the Big Five Inventory (BFI) were calculated.

**Table 4.11**

*Pearson's correlation coefficients for the Social Networking Addiction Scale (SNAS) and the Big Five Inventory (BFI)* (N = 611*).*

| Variable | Salience | Mood modification | Tolerance | Withdrawal | Relapse | SNAS Total |
|---|---|---|---|---|---|---|
| **Extraversion** | -.048 | -.078 | -.099* | -.024 | -.175*** | -.120*** |
| | .236 | .053 | .014 | .553 | < .001 | .003 |
| **Agreeableness** | -.061 | -.036 | -.093* | -.086* | -.117*** | -.116*** |
| | .133 | .369 | .022 | .034 | .004 | .004 |
| **Conscientiousness** | -.290*** | -.166*** | -.211*** | -.189*** | -.333*** | -.327*** |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 |
| **Neuroticism** | .237*** | .201*** | .238*** | .227*** | .292*** | .315*** |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 |
| **Openness** | -.065 | -.069 | -.111*** | -.034 | -.064 | -.082* |
| | .107 | .089 | < .001 | .399 | .112 | .043 |

**p < .05 (two-tailed); ***p < .001 (two-tailed)*

Table 4.11 presents the Pearson's correlation coefficients that were calculated to establish the nature of the relationships between social networking addiction and personality. The total score for social networking addiction was significantly, moderately, and positively related to neuroticism ($r$ = .315, $p$ < .001); significantly, weakly, and negatively related to extraversion ($r$ = -.120, $p$ = .003), agreeableness ($r$ = -.116, $p$ = .004), and openness ($r$ = -.082, $p$ = .043); and significantly, moderately, and negatively related to conscientiousness ($r$ = -.327, $p$ < .001). There were no statistically significant relationships between salience and extraversion ($r$ = -.048, $p$ = .236), agreeableness ($r$ = -.061, $p$ = .133), and openness ($r$ = -.065, $p$ = .107). However, salience was found to be positively, weakly, and significantly related to neuroticism ($r$ = .237, $p$ < .001), and negatively, weakly, and significantly related to conscientiousness ($r$ = -.290, $p$ < .001). Similarly, mood modification showed no significant relationships with extraversion ($r$ = -.078, $p$ = .053), agreeableness ($r$ = -.036, $p$ = .369), and

openness ($r$ = -.069, $p$ = .089). Conversely, mood modification showed a significant negative, weak relationship with conscientiousness ($r$ = -.166, $p$ < .001), and a significant, positive, weak relationship with neuroticism ($r$ = .201, $p$ < .001). Tolerance was found to be negatively, very weakly, and significantly related to extraversion ($r$ = -.099, $p$ = .014) and agreeableness ($r$ = -.093, $p$ = .022), and significantly, weakly, and negatively related to conscientiousness ($r$ = -.211, $p$ < .001) and openness ($r$ = -.111, $p$ = .006). Furthermore, tolerance showed a significant, positive, weak relationship with neuroticism ($r$ = .238, $p$ < .001). Withdrawal showed no significant relationships with extraversion ($r$ = -.024, $p$ = .553) and openness ($r$ = -.034, $p$ = .399). Further, withdrawal was found to be significantly, negatively, and very weakly related to agreeableness ($r$ = -.086, $p$ = .034), and significantly, negatively, and weakly related to conscientiousness ($r$ = -.189, $p$ < .001). There was a significant, positive, weak relationship between withdrawal and neuroticism ($r$ = .227, $p$ < .001). Relapse was found to be negatively, very weakly, and significantly related to extraversion ($r$ = -.175, $p$ < .001) and agreeableness ($r$ = -.117, $p$ = .004), and negatively, moderately, and significantly related to conscientiousness ($r$ = -.333, $p$ < .001). A significant, positive, weak relationship was found between relapse and neuroticism ($r$ = .292, $p$ < .001). Lastly, relapse showed no significant relationship with openness ($r$ = -.064, $p$ = .112). Interestingly, all five social networking addiction subscales, as well as the SNAS total scores, had significant weak to moderate, negative relationships with conscientiousness, and significant weak, positive relationships with neuroticism.

Further, in Table 4.12, the SNAS conflict subscale and personality traits were correlated with each other using Spearman's *r.* The conflict subscale was shown to be significantly, negatively, and weakly related to extraversion ($r_s$ = -.147, $p$ < .001), agreeableness ($r_s$ = -.153, $p$ < .001), and conscientiousness ($r_s$ = -.291, $p$ < .001). Furthermore, the conflict subscale was found to have no significant relationship with

openness ($r_s$ = -.069, $p$ = .088). In contrast, the relationship between SNAS conflict and neuroticism ($r_s$ = .246, $p$ < .001) was found to be significant, weak, and positive.

**Table 4.12**

*Spearman's Rank Order correlation coefficients for the conflict subscale of the Social Networking Addiction Scale (SNAS) and the Big Five Inventory (BFI)* (N = 611*)*

| Variable | Extraversion | Agreeableness | Conscientious-ness | Neuroticism | Openness |
|---|---|---|---|---|---|
| **Conflict** | -.147*** | -.153*** | -.291*** | .246*** | -.069 |
| | < .001 | < .001 | < .001 | < .001 | .088 |

****p < .01 (two-tailed).*

In order to further address the third research question in this study, Pearson's correlation coefficients were calculated for the relationships between the BFI subscales (extraversion, agreeableness, conscientiousness, neuroticism, and openness) and the DASS-21 subscales (depression, anxiety, and stress), as shown in Table 4.13.

**Table 4.13**

*Pearson's correlation coefficients for the Depression, Anxiety, and Stress Scales-21 (DASS-21) and the Big Five Inventory (BFI)* (N = 612))

| Variable | Depression | Anxiety | Stress | DASS Total |
|---|---|---|---|---|
| **Extraversion** | -.301*** | -.187*** | -.193*** | -.255** |
| | < .001 | < .001 | < .001 | < .001 |
| **Agreeableness** | -.220*** | -.121*** | -.217*** | -.208*** |
| | < .001 | < .001 | < .001 | < .001 |
| **Conscientiousness** | -.349*** | -.283*** | -.272*** | -.336*** |
| | < .001 | < .001 | < .001 | < .001 |
| **Neuroticism** | .609*** | .563*** | .651*** | .672*** |
| | < .001 | < .001 | < .001 | < .001 |
| **Openness** | -.078 | .042 | .024 | -.009 |
| | .053 | .298 | .550 | .827 |

****p < .01 (two-tailed).*

The trait extraversion had a significant, negative, and moderate relationship with depression ($r$ = -.301, $p$ < .001), and significant, negative, and weak relationships with anxiety ($r$ = -.187, $p$ < .001), stress ($r$ = -.193, $p$ < .001), and the total DASS-21 score ($r$ = -.255, $p$ < .001). Likewise, agreeableness was significantly, weakly, and negatively related to depression ($r$ = -.220, $p$ < .001), anxiety ($r$ = -.121, $p$ < .001), stress ($r$ = -.217, $p$ < .001), and the total DASS-21 score ($r$ = -.208, $p$ < .001). A similar pattern was noted for conscientiousness, which showed significant, negative, weak to moderate relationships with depression ($r$ = -.349, $p$ < .001), anxiety ($r$ = -.283, $p$ < .001), stress ($r$ = -.272, $p$ < .001), and the total DASS-21 score ($r$ = -.336, $p$ < .001). Neuroticism, however, showed strong, positive, and significant relationships with depression ($r$ = .609, $p$ < .001), anxiety ($r$ = .563, $p$ < .001), stress ($r$ = .651, $p$ < .001), and the total DASS-21 score ($r$ = .672, $p$ < .001). Lastly, openness was not significantly related to depression ($r$ = -.078, $p$ = .053), anxiety ($r$ = .042, $p$ = .298), stress ($r$ = .024, $p$ = .550), or the total DASS-21 score ($r$ = -.009, $p$ = .827).

### *4.3.3 Correlations between user motives, social network addiction and mental health*

In order to answer the fifth research question in this study regarding the nature of the relationships between user motives, social networking addiction, and mental health, correlations were calculated to demonstrate the relationships between the variables measured by the Scale of Motives for Using Social Networking Sites (SMU-SNS), the Social Networking Addiction Scale (SNAS), and the Depression, Anxiety, and Stress Scales (DASS-21). Firstly, Pearson's correlation coefficients were calculated for relationships between six of the nine subscales of the Scale of Motives for Using Social Networking Sites (SMU-SNS) (new friendships, academic purposes, social connectedness, following and monitoring others,

entertainment, and self-expression), and the total score for the SNAS, as well as five of the six SNAS subscales (salience, mood modification, tolerance, withdrawal, and relapse). Secondly, Spearman's Rank-Order correlation coefficients were calculated for the relationships between the sixth SNAS subscale, conflict, and the six SMU-SNS subscales. Three SMU-SNS subscales, dating, social recognition, and information had skewed distributions in the sample and Spearman's Rank-Order correlation coefficients were therefore calculated for the relationships between these subscales and the five SNAS subscales as well as the total score for the SNAS. Thereafter, Spearman's Rank-Order correlation coefficients were calculated for the relationships between the SNAS subscales, conflict, and the three SMU-SNS subscales, dating, social recognition, and information. The next step was to determine the relationships between the six SMU-SNS subscales and the DASS-21 subscales. Pearson's correlation coefficients were calculated for the relationships between the SMU-SNS subscales (new friendships, academic purposes, social connectedness, following and monitoring others, entertainment, and self-expression), and the DASS-21 subscales (depression, anxiety, and stress). Lastly, Spearman's Rank-Order correlation coefficients were calculated for the relationships between the three skewed SMU-SNS subscales (dating, social recognition, and information) and the DASS-21 subscales (depression, anxiety, and stress).

Table 4.14 presents the Pearson's correlation coefficients that were calculated to establish the nature of the relationships between social networking addiction and user motives.

**Table 4.14**

*Pearson's correlation coefficients for the Social Networking Addiction Scale (SNAS) and six subscales in the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 611*)*

| Variable | Salience | Mood Modification | Tolerance | Withdrawal | Relapse | SNAS Total |
|---|---|---|---|---|---|---|
| **New Friendships** | .114**<br>.005 | .112**<br>.006 | .050<br>.218 | .112**<br>.006 | .041<br>.314 | .104*<br>.010 |
| **Academic Purposes** | .155***<br>< .001 | .127**<br>.002 | .079<br>.050 | .138***<br>< .001 | .093*<br>.022 | .153***<br>< .001 |
| **Social Connectedness** | .321***<br>< .001 | .294***<br>< .001 | .248***<br>< .001 | .297***<br>< .001 | .189***<br>< .001 | .334***<br>< .001 |
| **Following Monitoring Others** | .277***<br>< .001 | .239***<br>< .001 | .203***<br>< .001 | .273***<br>< .001 | .180***<br>< .001 | .299***<br>< .001 |
| **Entertainment** | .415***<br>< .001 | .373***<br>< .001 | .363***<br>< .001 | .297***<br>< .001 | .330***<br>< .001 | .442***<br>< .001 |
| **Self-expression** | .171***<br>< .001 | .124**<br>.002 | .104*<br>.010 | .127**<br>.002 | .054<br>.185 | .134***<br>< .001 |

**p < .05 (two-tailed); **p< .01 (two-tailed); ***p < .001 (two-tailed)*

The total score for social networking addiction was significantly, moderately, and positively related to social connectedness ($r = .334$, $p < .001$), following and monitoring others ($r = .299$, $p < .001$), and entertainment ($r = .442$, $p < .001$), and was significantly, weakly, and positively related to new friendships ($r = .104$, $p = .010$), academic purposes ($r = .153$, $p < .001$), and self-expression ($r = .134$, $p < .001$). Similarly, salience was significantly, moderately, and positively related to social connectedness ($r = .321$, $p < .001$), following and monitoring others ($r = .277$, $p < .001$), and entertainment ($r = .451$, $p < .001$), and was significantly, weakly, and positively related to new friendships ($r = .114$, $p = .005$), academic purposes ($r = .155$, $p < .001$), and self-expression ($r = .171$, $p < .001$). Mood

modification showed significant, moderate, positive relationships with social connectedness ($r = .294$, $p < .001$) and entertainment ($r = .373$, $p < .001$), and significant, weak, positive relationships with new friendships ($r = .112$, $p = .006$), academic purposes ($r = .127$, $p = .002$), following and monitoring others ($r = .239$, $p < .001$), and self-expression ($r = .124$, $p = .002$). Tolerance had a significant, moderate, positive relationship with entertainment ($r = .363$, $p < .001$) and significant, weak, positive relationships with social connectedness ($r = .248$, $p < .001$), following and monitoring others ($r = .203$, $p < .001$), and self-expression ($r = .104$, $p = .010$). There were no significant relationships between tolerance and new friendships ($r = .050$, $p = .218$) or tolerance and academic purposes ($r = .079$, $p = .050$). Withdrawal was found to be significantly, positively, and moderately related to social connectedness ($r = .297$, $p < .001$), following and monitoring others ($r = .273$, $p < .001$), and entertainment ($r = .297$, $p < .001$), and was significantly, positively, and weakly related to new friendships ($r = .112$, $p = .006$), academic purposes ($r = .138$, $p < .001$), and self-expression ($r = .127$, $p = .002$). Lastly, relapse showed a significant, positive, and very weak relationship with academic purposes ($r = .093$, $p = .022$), and significant, weak, positive relationships with social connectedness ($r = .189$, $p < .001$) and following and monitoring others ($r = .180$, $p < .001$). Furthermore, relapse was found to have a positive, moderate relationship with entertainment ($r = .330$, $p < .001$). Lastly, relapse was not significantly related to new friendships ($r = .041$, $p = .314$), and self-expression ($r = .054$, $p = .185$).

Table 4.15 presents Spearman's Rank-Order correlation coefficients that were calculated for the relationships between the conflict subscale in the SNAS and six of the SMU-SNS subscales (new friendships, academic purposes, social connectedness, following and monitoring others, entertainment, and self-expression).

The SNAS conflict subscale was shown to be significantly, positively, and very weakly related to new friendships ($r_s$ = .089, $p$ = .028) and academic purposes ($r_s$ = .098, $p$ = .015), and was significantly, positively, and weakly related to social connectedness ($r_s$ = .153, $p$ < .001), following and monitoring others ($r_s$ = .201, $p$ < .001), and entertainment ($r_s$ = .247, $p$ < .001). Furthermore, the conflict subscale was found to have no significant relationship with self-expression ($r_s$ = .028, $p$ = .484).

**Table 4.15**

*Spearman's Rank Order correlation coefficients for the conflict subscale of the Social Networking Addiction Scale (SNAS) and six subscales in the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 611)

| Variable | New Friendships | Academic Purposes | Social Connectedness | Following Monitoring Others | Entertainment | Self-expression |
|---|---|---|---|---|---|---|
| **Conflict** | .089* | .098* | .153*** | .201*** | .247*** | .028 |
| | .028 | .015 | < .001 | < .001 | <.001 | .484 |

**p < .05 (two-tailed); ***p < .001 (two-tailed)*

In Table 4.16, Spearman's Rank-Order correlation coefficients were calculated for the relationships between three of the SMU-SNS subscales (dating, social recognition, and information) and the SNAS total score and five SNAS subscales (salience, mood modification, tolerance, withdrawal, and relapse). The total score for social networking addiction was significantly, moderately, and positively related to social recognition ($r_s$ = .298, $p$ < .001), and was significantly, weakly, and positively related to dating ($r_s$ = .120, $p$ = .003) and information ($r_s$ = .174, $p$ < .001). Salience was found to be significantly, weakly, and positively related to dating ($r_s$ = .146, $p$ < .001), social recognition ($r_s$ = .256, $p$ < .001), and information ($r_s$ = .182, $p$ < .001). Mood modification was not significantly related to dating

($r_s$ = .065, $p$ = .109) but was significantly, weakly, and positively related to social recognition ($r_s$ = .206, $p$ < .001), and information ($r_s$ = .139, $p$ < .001). Similarly, tolerance was not significantly related to dating ($r_s$ = .046, $p$ = .253) but was significantly, weakly, and positively related to social recognition ($r_s$ = .189, $p$ < .001), and information ($r_s$ = .120, $p$ = .003). Withdrawal was found to be significantly, weakly, and positively related to dating ($r_s$ = .134, $p$ < .001), social recognition ($r_s$ = .280, $p$ < .001), and information ($r_s$ = .107, $p$ = .008). Lastly, relapse had a weak, positive, and significant relationship with social recognition ($r_s$ = .181, $p$ < .001) and information ($r_s$ = .154, $p$ < .001), and no significant relationship with dating ($r_s$ = .068, $p$ =.093).

**Table 4.16**

*Spearman's Rank Order correlation coefficients for the Social Networking Addiction Scale (SNAS) and three subscales in the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 611)

| Variable | Salience | Mood Modification | Tolerance | Withdrawal | Relapse | SNAS Total |
|---|---|---|---|---|---|---|
| **Dating** | .146***<br>< .001 | .065<br>.109 | .046<br>.253 | .134***<br>< .001 | .068<br>.093 | .120**<br>.003 |
| **Social Recognition** | .256***<br>< .001 | .206***<br>< .001 | .189***<br>< .001 | .280***<br>< .001 | .181***<br>< .001 | .298***<br>< .001 |
| **Information** | .182***<br>< .001 | .139***<br>< .001 | .120**<br>.003 | .107**<br>.008 | .154***<br>< .001 | .174***<br>< .001 |

***p < .01 (two-tailed); ***p < .001 (two-tailed)*

As shown in Table 4.17, Spearman's Rank-Order correlation coefficients were calculated for the relationships between the conflict subscale of the SNAS and three SMU-SNS subscales (dating, social recognition, and information). The SNAS conflict subscale was shown to be significantly, positively, and very weakly related to dating ($r_s$ = .094, $p$ = .020), and, furthermore, significantly, positively, and weakly related to social recognition ($r_s$ = .242,

$p < .001$). The conflict subscale was not significantly related to information ($r_s = .038$, $p = .343$).

**Table 4.17**

*Spearman's Rank Order correlation coefficients for the conflict subscale of the Social Networking Addiction Scale (SNAS) and three subscales in the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 611)

| Variable | Dating | Social Recognition | Information |
|---|---|---|---|
| **Conflict** | .094* | .242*** | .038 |
| | .020 | < .001 | .343 |

**p < .05 (two-tailed); ***p < .001 (two-tailed)*

As shown in Table 4.18, Pearson's correlation coefficients were calculated for the relationships between the SMU-SNS subscales (new friendships, academic purposes, social connectedness, following and monitoring others, entertainment, and self-expression), and the DASS-21 subscales (depression, anxiety, and stress) and DASS-21 total score.

The SMU-SNS subscale new friendships was significantly, positively, and weakly related to depression ($r = .124$, $p = .002$), anxiety ($r = .133$, $p = .001$), and the DASS-21 total score ($r = .131$, $p = .001$), and was significantly, positively, and more weakly related to stress ($r = .099$, $p = .015$). Academic purposes showed no significant relationship with depression ($r = .048$, $p = .238$), but was significantly, positively, and weakly related to anxiety ($r = .109$, $p = .007$), stress ($r = .126$, $p = .002$), and the DASS-21 total score ($r = .101$, $p = .012$). Social connectedness had significant, weak, positive relationships with depression ($r = .178$, $p < .001$), anxiety ($r = .171$, $p < .001$), stress ($r = .201$, $p < .001$), and the DASS-21 total score ($r = .203$, $p < .001$). Similarly, following and monitoring others showed significant, weak, positive relationships with depression ($r = .174$, $p < .001$), anxiety ($r = .167$, $p < .001$), stress ($r = .278$, $p < .001$), and the DASS-21 total score ($r = .226$, $p < .001$). Entertainment also showed significant, weak, positive relationships with depression ($r = .281$, $p < .001$), anxiety

($r$ = .187, $p$ < .001), stress ($r$ = .193, $p$ < .001), and the DASS-21 total score ($r$ = .222, $p$ < .001). Self-expression, however, was not significantly related to depression ($r$ = .052, $p$ = .197), stress ($r$ = .040, $p$ = .323), or the DASS-21 total score ($r$ = .066, $p$ = .100), and was only significantly, very weakly, and positively related to anxiety ($r$ = .090, $p$ = .026).

**Table 4.18**

*Pearson's correlation coefficients for the Depression, Anxiety, and Stress Scales-21 (DASS-21) and six subscales in the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 611)

| Variable | Depression | Anxiety | Stress | DASS-Total |
|---|---|---|---|---|
| **New Friendships** | .124**<br>.002 | .133**<br>.001 | .099*<br>.015 | .131**<br>.001 |
| **Academic Purposes** | .048<br>.238 | .109**<br>.007 | .126**<br>.002 | .101*<br>.012 |
| **Social Connectedness** | .178***<br>< .001 | .171***<br>< .001 | .201***<br>< .001 | .203***<br>< .001 |
| **Following Monitoring Others** | .174***<br>< .001 | .167***<br>< .001 | .278***<br>< .001 | .226***<br>< .001 |
| **Entertainment** | .218***<br>< .001 | .187***<br>< .001 | .193***<br>< .001 | .222***<br>< .001 |
| **Self-expression** | .052<br>.197 | .090*<br>.026 | .040<br>.323 | .066<br>.100 |

**p < .05 (two-tailed); **p < .01 (two-tailed); ***p < .001 (two-tailed)*

As shown in Table 4.19, Spearman's Rank-Order correlation coefficients were calculated for the relationships between three of the SMU-SNS subscales (dating, social recognition, and information) and the DASS-21 subscales (depression, anxiety, and stress) and DASS-21 total score.

**Table 4.19**

*Spearman's Rank Order correlation coefficients for the Depression, Anxiety, and Stress Scales-21 (DASS-21) and three subscales in the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 611)

| Variable | Depression | Anxiety | Stress | DASS-Total |
|---|---|---|---|---|
| **Dating** | .109**<br>.007 | .129**<br>.001 | .086*<br>.034 | .119**<br>.003 |
| **Social Recognition** | .180***<br><.001 | .188***<br><.001 | .188***<br><.001 | .207***<br>< .001 |
| **Information** | .032<br>.429 | .108**<br>.007 | .065<br>.109 | .071<br>.080 |

**p < .05 (two-tailed); **p < 0.01 (two-tailed); ***p < .001 (two-tailed)*

The SMU-SNS subscale dating was significantly, weakly, and positively related to depression ($r_s$ = .109, $p$ = .007), anxiety ($r_s$ = .129, $p$ < .001), and the DASS-21 total score ($r_s$ = .119, $p$ = .003), and was significantly, very weakly, and positively related to stress ($r_s$ = .086, $p$ = .034). Furthermore, social recognition was significantly, weakly, and positively related to depression ($r_s$ = .180, $p$ < .001), anxiety ($r_s$ = .188, $p$ < .001), stress ($r_s$ = .188, $p$ < .001), and the DASS-21 total score ($r_s$ = .207, $p$ < .001). Information, however, was not significantly related to depression ($r_s$ = .032, $p$ = .429), stress ($r_s$ = .065, $p$ = .109), or the DASS-21 total score ($r_s$ = .071, $p$ = .080), and was only significantly, weakly, and positively related to anxiety ($r_s$ = .108, $p$ = .007).

Although not used to answer the research questions, correlations were calculated to establish the nature of the relationships between the subscales in each scale (please see Appendix L). Likewise, correlations between the Big Five Inventory (BFI) and the Scale of Motives for Users of Social Networking Sites (SMU-SNS) are also included in Appendix L.

### 4.4 Moderated multiple regression: Personality as a moderator

The fourth research question in the study explored whether the nature of the relationships between social networking addiction and mental health differed on the basis of the participant's personality characteristics i.e., whether personality moderated the relationships between social networking addiction and depression, anxiety, and stress. Moderated multiple regression models were created using Hayes process in IBM SPSS Statistics© v. 28 to determine whether there were significant main and interaction effects between the variables. The aim was to assess whether there were significant relationships between social networking addiction and depression, anxiety, and stress and whether these relationships appeared to be different based on the level of each personality trait in the Big Five model (Baron & Kenny, 1986; M. Fritz & Arthur, 2017). Prior to running the analyses, all underlying assumptions for multiple regression were established. With 611 respondents and two independent variables, there were substantially more observations than the minimum required to support multiple regression (Howell, 2016). All data in the models was also measured in a way where the data could be treated as interval. The normal probability plot (P-P) and scatterplot for each model were examined, thus confirming the assumptions of normality, homoscedasticity, and linearity (Tabachnick & Fidell, 2013). All P-P plots showed points directly on or relatively close to the straight diagonal lines and all scatterplots were evenly scattered from left to right (Field, 2018). Standard residuals analyses were performed on the data to detect any outliers, and the results showed that none of the participants needed to be removed (Montgomery et al., 2013). Furthermore, the assumption of multicollinearity was not violated. In all of the predictive models, none of the tolerance values were more than 0.100, none of the VIF values exceeded 5, and none of the condition indices were above 30 (Alin, 2010; Daoud, 2017; Tabachnick & Fidell, 2013). Durbin-Watson statistics close to ± 2 were generated in all cases, indicating that there was minimal autocorrelation between the

residuals for the variables (Verma & Abdel-Salam, 2019), therefore, the data met the assumption of independence of the observations.

The predictive models exploring the moderating role of personality in the social networking addiction-mental health relationships are presented in sections 4.4.1. to 4.4.5.

### *4.4.1 Predictive models with extraversion as the moderator*

Models 1A, 1B, and 1C in Table 4.20 were used to determine if extraversion significantly moderated the relationships between social networking addiction and depression, anxiety, and stress respectively. For these models, tolerance values ranged from .982 to .996; VIF values ranged from 1.004 to 1.018; and the condition index ranged from 1.024 to 1.165, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.984 for Model 1A, 2.042 for Model 1B, and 1.987 for Model 1C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 1A was significant ($F_{3;607} = 51.352$; $p = .000$) and the coefficient of determination ($R^2 = .202$) indicated that social networking addiction, extraversion, and the interaction between these accounted for 20.2% of the variance in depression. Notably, no significant interaction was seen between social networking addiction and extraversion on depression ($b = -0.001$, $t = -0.234$, $p = .815$), showing that extraversion did not significantly moderate the association between depression and social networking addiction in the sample. However, both social networking addiction ($b = 0.127$, $t = 9.230$, $p = .000$) and extraversion ($b = -0.241$, $t = -7.084$, $p = .000$) were significant predictors of depression in the model. This indicated that each of them contributed meaningfully to predicting depression levels in the sample.

**Table 4.20**

*Predictive models for social networking addiction and depression, anxiety, and stress with extraversion as the moderator (n = 611)*

| **Model 1A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .450 | .202 | 51.352 | .000 | .000 | .815 |
| **Model 1A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.025 | 0.228 | 35.160 | .000 | 7.577 | 8.473 |
| **SNA** | 0.127 | 0.014 | 9.230 | .000 | 0.100 | 0.154 |
| **Extraversion** | -0.241 | 0.034 | -7.084 | .000 | -0.308 | -0.174 |
| **Interaction** | -0.001 | 0.002 | -0.234 | .815 | -0.004 | 0.004 |
| **Model 1B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .350 | .123 | 28.308 | .000 | .000 | .623 |
| **Model 1B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.705 | 0.204 | 32.944 | .000 | 6.305 | 7.105 |
| **SNA** | 0.095 | 0.123 | 7.764 | .000 | 0.071 | 0.119 |
| **Extraversion** | -0.118 | 0.030 | -3.895 | .000 | -0.178 | -0.586 |
| **Interaction** | -0.001 | 0.002 | -0.492 | .623 | -0.004 | 0.026 |
| **Model 1C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .390 | .152 | 36.302 | .000 | .000 | .794 |
| **Model 1C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.666 | 0.203 | 42.799 | .000 | 8.269 | 9.064 |
| **SNA** | 0.110 | 0.122 | 9.006 | .000 | 0.086 | 0.134 |
| **Extraversion** | -0.123 | 0.030 | -4.082 | .000 | -0.182 | -0.064 |
| **Interaction** | -0.001 | 0.002 | -0.261 | .794 | -0.004 | 0.003 |

*Note*. SNA = social networking addiction

Model 1B was significant ($F_{3;607}$ = 28.308; $p$ = .000) and the coefficient of determination ($R^2$ = .123) indicated that social networking addiction, extraversion, and the interaction between these accounted for 12.3% of the variance in anxiety. There was no significant interaction between social networking addiction and extraversion on anxiety ($b$ = -0.001, $t$ = -0.492, $p$ = .623), therefore extraversion was not a significant moderator of the social networking addiction and anxiety relationship in the sample. However, both social

networking addiction ($b$ = 0.095, $t$ = 7.764, $p$ = .000) and extraversion ($b$ = -0.118, $t$ = -3.895, $p$ = .000) were significant predictors of anxiety, with each contributing meaningfully to predicting levels of anxiety in the sample.

Model 1C was significant ($F_{3;607}$ = 36.302; $p$ = .000) and the coefficient of determination ($R^2$ = .152) implied that 15.2% of the variance in stress was explained by social networking addiction, extraversion, and the interaction between these. No significant interaction was produced between social networking addiction and extraversion on stress ($b$ = -0.001, $t$ = -0.261, $p$ = .794), thus extraversion was not a significant moderator of the social networking addiction and stress relationship in the sample. However, social networking addiction ($b$ = 0.110, $t$ = 9.006, $p$ = .000) and extraversion ($b$ = -0.123, $t$ = -4.082, $p$ = .000) were significant predictors of stress, both of which contributed separately and meaningfully to predicting levels of anxiety in the sample.

### *4.4.2 Predictive models with agreeableness as the moderator*

Models 2A, 2B, and 2C presented in Table 4.21 examined the moderating role of agreeableness on the relationships between social networking addiction and depression, anxiety, and stress respectively. For these models, tolerance values ranged from .978 to .991; VIF values ranged from 1.009 to 1.022; and the condition index ranged from 1.027 to 1.185, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.996 for Model 2A, 2.067 for Model 2B, and 2.010 for Model 2C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

**Table 4.21**

*Predictive models for social networking addiction and depression, anxiety, and stress with agreeableness as the moderator (n = 611)*

| **Model 2A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .417 | .174 | 42.590 | .000 | .006 | .034 |
| **Model 2A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 7.974 | 0.232 | 34.344 | .000 | 7.518 | 8.430 |
| **SNA** | 0.128 | 0.014 | 9.151 | .000 | 0.101 | 0.156 |
| **Agreeableness** | -0.192 | 0.039 | -4.867 | .000 | -0.269 | -0.114 |
| **Interaction** | -0.001 | 0.002 | -2.123 | .034 | -0.010 | -0.000 |
| **Model 2B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .332 | .110 | 25.080 | .000 | .003 | .164 |
| **Model 2B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.684 | 0.205 | 32.622 | .000 | 6.282 | 7.086 |
| **SNA** | 0.097 | 0.124 | 7.809 | .000 | 0.072 | 0.121 |
| **Agreeableness** | -0.077 | 0.035 | -2.220 | .027 | -0.145 | -0.009 |
| **Interaction** | -0.003 | 0.002 | -1.393 | .164 | -0.007 | 0.001 |
| **Model 2C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .412 | .170 | 41.415 | .000 | .009 | .009 |
| **Model 2C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.613 | 0.200 | 43.002 | .000 | 8.219 | 9.006 |
| **SNA** | 0.106 | 0.121 | 8.797 | .000 | 0.083 | 0.130 |
| **Agreeableness** | -0.167 | 0.034 | -4.909 | .000 | -0.233 | -0.100 |
| **Interaction** | -0.005 | 0.002 | -2.614 | .009 | -0.009 | -0.001 |

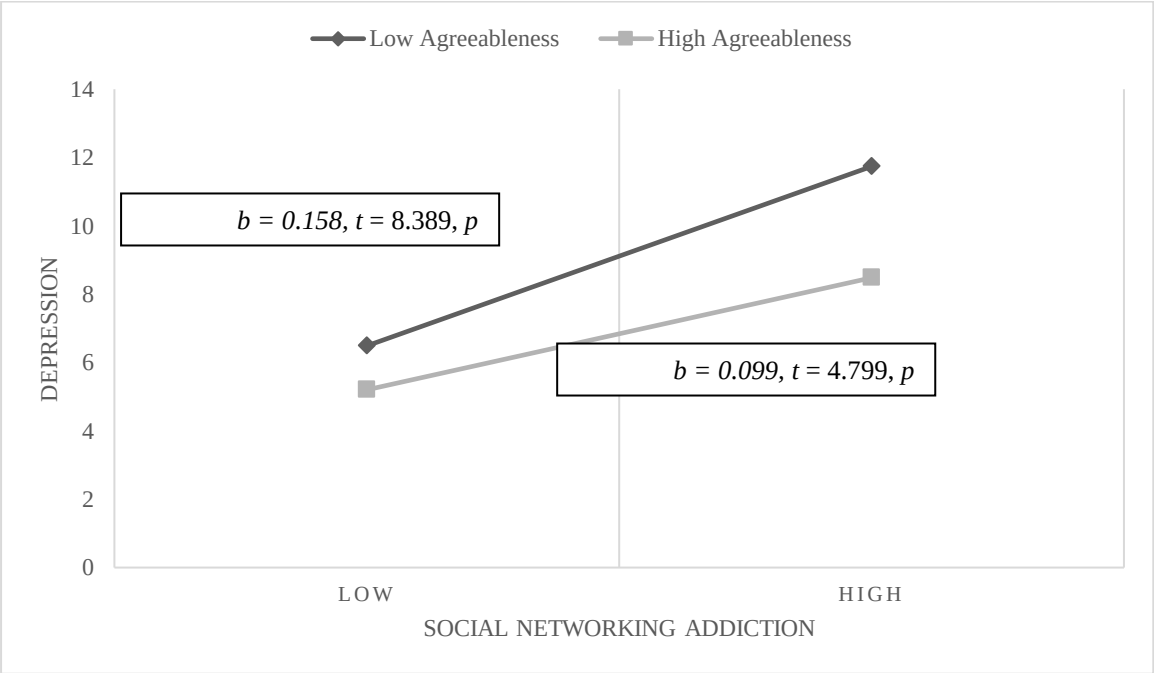
*Note*. SNA = social networking addiction

Model 2A was significant ($F_{3;607}$ = 42.590; $p$ = .000) and the coefficient of determination ($R^2$ = .174) indicated that social networking addiction, agreeableness, and the interaction between these accounted for 17.4% of the change in depression. Moreover, there was a significant interaction between social networking addiction and agreeableness on depression ($b$ = -0.001, $t$ = -2.123, $p$ = .034). The model also showed that both social

networking addiction ($b$ = 0.128, $t$ = 9.151, $p$ = .000) and agreeableness ($b$ = -.192, $t$ = 4.867, $p$ = .000) were significant predictors of depression independently.

**Figure 4.1**

*Simple slopes analysis: Social networking addiction and depression with agreeableness as a moderator*




In Figure 4.1, the regression slopes represent the relationships between social networking addiction and depression at low and high levels of agreeableness, created by carrying out a simple slopes analysis one standard deviation below and above the mean (Aiken & West, 1991). The non-parallel slopes in the graph supported the finding of a significant interaction between social networking addiction and agreeableness on depression ($b$ = -0.005, $t$ = -2.123, $p$ = .034). For participants with lower levels of agreeableness, those with higher levels of social networking addiction symptoms reported significantly higher levels of depression than those with lower levels of social networking addiction symptoms ($b$ = 0.158, $t$ = 8.389, $p$ = .000). For participants with higher levels of agreeableness, those with higher levels of social networking addiction symptoms also reported significantly higher

levels of depression than those with lower levels of social networking addiction symptoms ($b$ = 0.099, $t$ = 4.799, $p$ = .000) but the relationship was not as strong. This indicated that in the sample, higher levels of depression were more likely to manifest in those with lower levels of agreeableness when social networking addiction levels increased; thus, the relationship between social networking addiction and depression was weakened (buffered) by higher levels of the trait agreeableness.

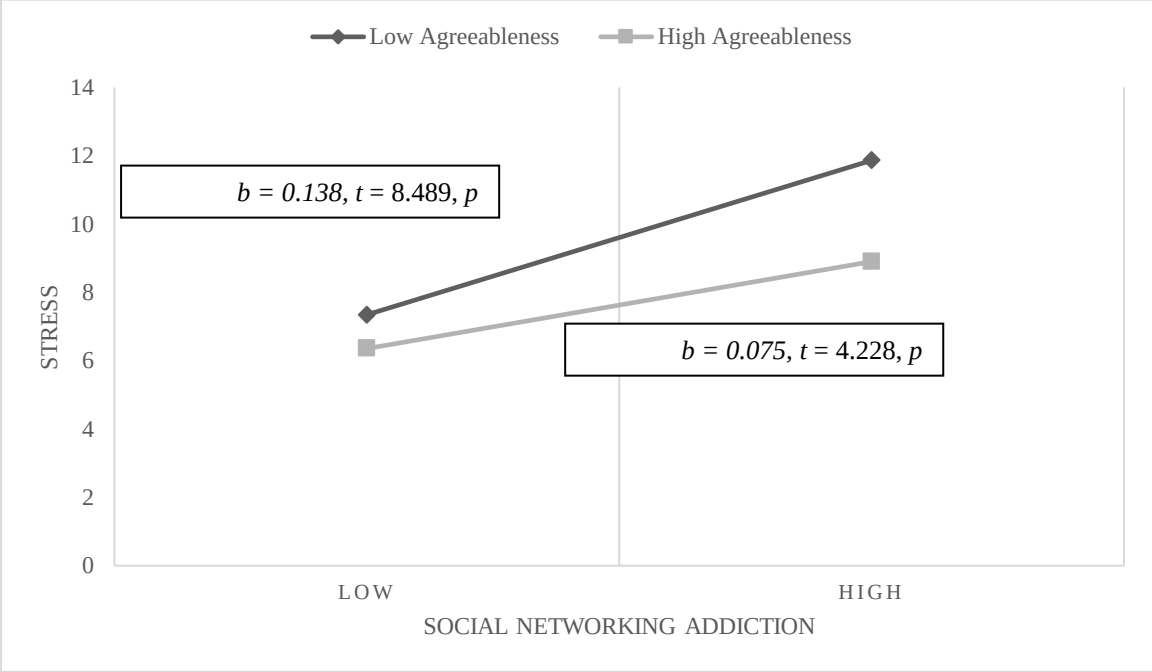
Model 2B investigated whether agreeableness was a significant moderator of the relationship between social networking addiction and anxiety. The model was significant ($F_{3;607}$ = 25.080; $p$ = .000) and the coefficient of determination ($R^2$ = .110) indicated that social networking addiction, agreeableness, and the interaction between these accounted for 11% of the variance in anxiety. No significant interaction was seen between social networking addiction and agreeableness on anxiety ($b$ = -0.003, $t$ = -1.393, $p$ = .164), thus agreeableness was not a significant moderator of the social networking addiction and anxiety relationship in the sample. However, social networking addiction ($b$ = 0.097, $t$ = 7.809, $p$ = .000) and agreeableness ($b$ = -0.077, $t$ = -2.220, $p$ = .027) were both significant predictors of anxiety in the model, with each contributing in a separate but significant way to predicting anxiety levels in the sample.

Lastly, Model 2C examined whether agreeableness significantly moderated the relationship between social networking addiction and stress. Overall, the model was found to be significant ($F_{3;607}$ = 41.415; $p$ = .000) and the coefficient of determination ($R^2$ = .170) suggested that 17% of the variance in stress was explained by social networking addiction, agreeableness, and the interaction between these. Furthermore, there was a significant interaction between social networking addiction and agreeableness on stress ($b$ = -0.005, $t$ = -2.614, $p$ = .009) thus, in the sample, agreeableness was a significant moderator of the social networking addiction and stress relationship. In addition, both social networking addiction ($b$

= 0.106, $t$ = 8.797, $p$ = .000) and agreeableness ($b$ = -0.167, $t$ = -4.909, $p$ = .000) were significant predictors of stress in the model.

**Figure 4.2**

*Simple slopes analysis: Social networking addiction and stress with agreeableness as a moderator*




In Figure 4.2, the regression slopes represent the relationships between social networking addiction and stress at low and high levels of agreeableness, created by carrying out a simple slopes analysis one standard deviation below and above the mean (Aiken & West, 1991). The non-parallel slopes in the graph supported the finding of a significant interaction between social networking addiction and agreeableness on stress ($b$ = -0.005, $t$ = -2.614, $p$ = .009). For participants with lower levels of agreeableness, those with higher levels of social networking addiction symptoms reported significantly higher levels of stress than those with lower levels of social networking addiction symptoms ($b$ = 0.138, $t$ = 8.489, $p$ = .000). For participants with higher levels of agreeableness, those with higher levels of

social networking addiction symptoms also reported significantly higher levels of stress than those with lower levels of social networking addiction symptoms ($b$ = 0.075, $t$ = 4.228, $p$ = .000) but the relationship was not as strong. This indicated that in the sample, individuals with lower levels of agreeableness were more prone to experience higher levels of stress when social networking addiction levels increased; thus, similarly to the relationship between social networking addiction and depression, the relationship between social networking addiction and stress was weakened (buffered) by higher levels of the trait agreeableness.

### *4.4.3 Predictive models with conscientiousness as the moderator*

As shown in Table 4.22, model 3A, 3B, and 3C examined the moderating role of conscientiousness on the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .890 to .993; VIF values ranged from 1.007 to 1.124; and the condition index ranged from 1.050 to 1.438, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.958 for Model 3A, 2.049 for Model 3B, and 1.975 for Model 3C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 3A was significant ($F_{3;607}$ = 49.377; $p$ = .000) and the coefficient of determination ($R^2$ = .196) indicated that social networking addiction, conscientiousness, and the interaction between these accounted for 19.6% of the variance in depression. No significant interaction was seen between social networking addiction and conscientiousness on depression ($b$ = -0.002, $t$ = -1.135, $p$ = .257) thus, in the sample, conscientiousness was not a significant moderator of the social networking addiction and depression relationship. Lastly, social networking addiction ($b$ = 0.107, $t$ = 7.347, $p$ = .000) and conscientiousness ($b$ = -

0.244, $t$ = -6.573, $p$ = .000) were significant predictors of depression in the model, with each independently contributing in a significant way to predicting depression levels in the sample.

**Table 4.22**

*Predictive models for social networking addiction and depression, anxiety, and stress with conscientiousness as the moderator (n = 611)*

| **Model 3A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .443 | .196 | 49.377 | .000 | .002 | .257 |
| **Model 3A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 7.948 | 0.239 | 33.241 | .000 | 7.478 | 8.417 |
| **SNA** | 0.107 | 0.015 | 7.347 | .000 | 0.078 | 0.135 |
| **Conscientiousness** | -0.244 | 0.037 | -6.573 | .000 | -0.317 | -0.171 |
| **Interaction** | -0.002 | 0.002 | -1.135 | .257 | -0.007 | 0.002 |
| **Model 3B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .369 | .137 | 31.976 | .000 | .000 | .670 |
| **Model 3B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.689 | 0.211 | 31.746 | .000 | 6.275 | 7.103 |
| **SNA** | 0.080 | 0.013 | 6.270 | .000 | 0.055 | 0.105 |
| **Conscientiousness** | -0.163 | 0.033 | -4.990 | .000 | -0.227 | -0.099 |
| **Interaction** | -0.000 | 0.002 | -0.426 | .670 | -0.004 | 0.003 |
| **Model 3C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .395 | .156 | 37.432 | .000 | .000 | .774 |
| **Model 3C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.691 | 0.211 | 41.230 | .000 | 8.277 | 9.105 |
| **SNA** | 0.098 | 0.013 | 7.655 | .000 | 0.073 | 0.123 |
| **Conscientiousness** | -0.145 | 0.033 | -4.432 | .000 | -0.209 | -0.081 |
| **Interaction** | -0.001 | 0.002 | 0.287 | .774 | -0.003 | 0.004 |

*Note*. SNA = social networking addiction

Model 3B was significant ($F_{3;607}$ = 31.976, p = .000) and the coefficient of determination ($R^2$ = .137) indicated that social networking addiction, conscientiousness, and the interaction between these accounted for 13.7% of the variance in anxiety. There was no significant interaction between social networking addiction and conscientiousness on anxiety

($b$ = -0.000, $t$ = -0.426, $p$ = .670), thus conscientiousness was not a significant moderator of the social networking addiction and anxiety relationship in the sample. However, social networking addiction ($b$ = 0.080, $t$ = 6.270, $p$ = .000) and conscientiousness ($b$ = -0.163, $t$ = -4.990, $p$ = .000) were significant predictors of anxiety in the model. This suggested that both independently played a meaningful role in predicting levels of anxiety in the sample.

Model 3C was significant ($F_{3;607}$ = 37.432, $p$ = .000) where the coefficient of determination ($R^2$ = .156) indicated that 15.6% of the variance in stress was explained by social networking addiction, conscientiousness, and the interaction between these. There was no significant interaction between social networking addiction and conscientiousness on stress ($b$ = -0.001, $t$ = 0.287, $p$ = .774) thus, in the sample, conscientiousness was not a significant moderator of the social networking addiction and stress relationship. However, both social networking addiction ($b$ = 0.098, $t$ = 7.655, $p$ = .000) and conscientiousness ($b$ = -0.145, $t$ = -4.432, $p$ = .000) were significant predictors of stress in the model, with both contributing separately and meaningfully to predicting stress levels in the sample.

### *4.4.4 Predictive models with neuroticism as the moderator*

As presented in Table 4.23, models 4A, 4B, and 4C were used to determine whether neuroticism significantly moderated the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .891 to .989; VIF values ranged from 1.011 to 1.122; and the condition index ranged from 1.037 to 1.450, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.989 for Model 4A, 2.022 for Model 4B, and 2.112 for Model 4C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

**Table 4.23**

*Predictive models for social networking addiction and depression, anxiety, and stress with neuroticism as the moderator (n = 611)*

| **Model 4A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .639 | .408 | 139.518 | .000 | .003 | .081 |
| **Model 4A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 7.926 | 0.204 | 38.798 | .000 | 7.525 | 8.327 |
| **SNA** | 0.072 | 0.012 | 5.784 | .000 | 0.048 | 0.096 |
| **Neuroticism** | 0.511 | 0.031 | 16.647 | .000 | 0.450 | 0.571 |
| **Interaction** | 0.003 | 0.002 | 1.750 | .081 | -0.00 | 0.006 |
| **Model 4B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .584 | .341 | 104.882 | .000 | .003 | .106 |
| **Model 4B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.630 | 0.183 | 36.181 | .000 | 6.270 | 6.989 |
| **SNA** | 0.048 | 0.011 | 4.277 | .000 | 0.026 | 0.070 |
| **Neuroticism** | 0.409 | 0.028 | 14.855 | .000 | 0.355 | 0.463 |
| **Interaction** | 0.003 | 0.002 | 1.618 | .106 | -0.001 | 0.006 |
| **Model 4C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .673 | .453 | 167.764 | .000 | .002 | .179 |
| **Model 4C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.606 | 0.169 | 50.939 | .000 | 8.274 | 8.938 |
| **SNA** | 0.054 | 0.010 | 5.216 | .000 | 0.033 | 0.074 |
| **Neuroticism** | 0.481 | 0.025 | 18.967 | .000 | 0.431 | 0.531 |
| **Interaction** | 0.002 | 0.001 | 1.345 | .179 | -0.001 | 0.005 |

*Note*. SNA = social networking addiction

Model 4A was significant ($F_{3;607}$ = 139.518, $p$ = .000) and the coefficient of determination ($R^2$ = .408) indicated that social networking addiction, neuroticism, and the interaction between these accounted for 40.8% of the variance in depression. Further, the model showed no significant interaction between social networking addiction and neuroticism on depression ($b$ = -0.003, $t$ = 1.750, $p$ = .081) thus, in the sample, neuroticism was not a significant moderator of the social networking addiction and depression

relationship. However, both social networking addiction ($b$ = 0.072, $t$ = 5.784, $p$ = .000) and neuroticism ($b$ = 0.511, $t$ = 16.647, $p$ = .000) were significant predictors of depression in the model. This indicated that each of them contributed meaningfully to predicting depression levels in the sample.

Model 4B was significant ($F_{3;607}$ = 104.882, $p$ = .000) and the coefficient of determination ($R^2$ = .341) indicated that social networking addiction, neuroticism, and the interaction between these accounted for 34.1% of the variance in anxiety. There was no significant interaction between social networking addiction and neuroticism on anxiety ($b$ = 0.003, $t$ = 1.618, $p$ = .106) therefore neuroticism was not a significant moderator of the social networking addiction and anxiety relationship in the sample. Both social networking addiction ($b$ = 0.048, $t$ = 4.277, $p$ = .000) and neuroticism ($b$ = -0.409, $t$ = 14.855, $p$ = .000) were significant predictors of anxiety, with each contributing meaningfully to predicting levels of anxiety in the sample.

Model 4C was also significant ($F_{3;607}$ = 167.764, $p$ = .000) and the coefficient of determination ($R^2$ = .453) implied that 45.3% of the variance in stress was explained by social networking addiction, neuroticism, and the interaction between these. No significant interaction was noted between social networking addiction and neuroticism on stress ($b$ = -0.002, $t$ = 1.345, $p$ = 0.179) thus, in the sample, neuroticism was not a significant moderator of the social networking addiction and stress relationship. Further, social networking addiction ($b$ = 0.054, $t$ = 5.216, $p$ = .000) and neuroticism ($b$ = 0.481, $t$ = 18.967, $p$ = .000) were significant predictors of stress in the model, with each contributing separately and meaningfully to predicting stress levels in the sample.

### *4.4.5 Predictive models with openness to experience as the moderator*

**Table 4.24**

*Predictive models for social networking addiction and depression, anxiety, and stress with openness to experience as the moderator (n = 611)*

| **Model 5A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .373 | .139 | 32.748 | .000 | .001 | .548 |
| **Model 5A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.042 | 0.236 | 34.058 | .000 | 7.578 | 8.506 |
| **SNA** | 0.137 | 0.014 | 9.677 | .000 | 0.110 | 0.165 |
| **Openness** | -0.050 | 0.040 | -1.263 | .207 | -0.128 | 0.028 |
| **Interaction** | 0.001 | 0.002 | 0.601 | .548 | -0.003 | 0.006 |
| **Model 5B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .326 | .106 | 24.087 | .000 | .001 | .367 |
| **Model 5B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.731 | 0.205 | 32.902 | .000 | 6.329 | 7.133 |
| **SNA** | 0.103 | 0.012 | 8.390 | .000 | 0.079 | 0.127 |
| **Openness** | 0.062 | 0.034 | 1.810 | .708 | -0.005 | 0.130 |
| **Interaction** | 0.002 | 0.002 | 0.903 | .367 | -0.002 | 0.006 |
| **Model 5C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .364 | .132 | 30.798 | .000 | .000 | .588 |
| **Model 5C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.681 | 0.204 | 42.548 | .000 | 8.281 | 9.082 |
| **SNA** | 0.118 | 0.123 | 9.580 | .000 | 0.093 | 0.142 |
| **Openness** | 0.049 | 0.034 | 1.442 | .150 | -0.018 | 0.117 |
| **Interaction** | 0.001 | 0.002 | 0.542 | .588 | -0.003 | 0.005 |

*Note*. SNA = social networking addiction

As shown in Table 4.24, models 5A, 5B, and 5C were used to determine the moderating role of openness to experience on the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .992 to .999; VIF values ranged from 1.001 to 1.008; and the condition index ranged

from 1.013 to 1.104, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.970 for Model 5A, 2.044 for Model 5B, and 1.973 for Model 5C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 5A was significant ($F_{3;607} = 32.748$; $p = .000$) and the coefficient of determination ($R^2 = .139$) indicated that social networking addiction, openness, and the interaction between these accounted for 13.9% of the variance in depression. No significant interaction was seen between social networking addiction and openness on depression ($b = 0.001$, $t = 0.601$, $p = .548$), showing that openness was not a significant moderator of the social networking addiction and depression relationship in the sample. Furthermore, openness ($b = -0.050$, $t = -1.263$, $p = .207$) on its own was not a significant predictor of depression in the model however social networking addiction ($b = 0.137$, $t = 9.677$, $p = .000$) was a significant predictor of depression levels in the sample.

Model 5B was significant ($F_{3;607} = 24.087$; $p = .000$) and the coefficient of determination ($R^2 = .106$) indicated that social networking addiction, openness, and the interaction between these accounted for 10.6% of the variance in anxiety. No significant interaction was seen between social networking addiction and openness on anxiety ($b = 0.002$, $t = 0.903$, $p = .367$), thus openness was not a significant moderator of the social networking addiction and anxiety relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b = 0.103$, $t = 8.390$, $p = .000$) and played a meaningful role in predicting levels of anxiety in the sample, however openness ($b = 0.062$, $t = 1.810$, $p = .708$) was not a significant predictor of anxiety in the model.

Lastly, Model 5C was significant ($F_{3;607} = 30.798$, $p = .000$) where according to the coefficient of determination ($R^2 = .132$), 13.2% of the variance in stress was explained by social networking addiction, openness, and the interaction between these. There was no

significant interaction between social networking addiction and openness on stress ($b$ = 0.001, $t$ = 0.542, $p$ = .588) therefore openness was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.118, $t$ = 9.580, $p$ = .000) and played a meaningful role in predicting levels of stress in the sample however openness ($b$ = 0.049, $t$ = 1.442, $p$ = .150) was not a significant predictor of stress in the model.

### *4.4.6 Conclusion*

Based on the output generated, social networking addiction was a consistently significant and positive predictor of depression, anxiety, and stress across all of the models. Extraversion, agreeableness, conscientiousness, and neuroticism were also all significant predictors of mental health across all of the models, with lower levels of extraversion, agreeableness, and conscientiousness and higher levels of neuroticism predicting higher levels of depression, anxiety, and stress. Openness to experience was not a significant predictor of mental health in any of the models. The results also showed that only one personality trait—agreeableness—had a significant moderating effect on the social networking addiction-mental health relationship. Both the relationship between social networking addiction and depression and the relationship between social networking addiction and stress were significantly moderated by agreeableness, such that these relationships were weaker for higher levels of agreeableness. Agreeableness thus acted as a buffer in these relationships, but was not a significant moderator in the relationship between social networking addiction and anxiety.

### 4.5 Moderated multiple regression: User motives as a moderator

For the sixth research question in the study regarding whether the nature of the relationships between social networking addiction and mental health differed on the basis of motives for using social networks i.e., whether user motives moderated the relationships between social networking addiction and depression, anxiety, and stress. Moderated multiple regression models were created using Hayes process in IBM SPSS Statistics© v. 28 to determine whether there were significant main and interaction effects between the variables. The aim was to assess whether there were significant relationships between social networking addiction and depression, anxiety, and stress and whether these relationships differed based on nine separate motives for using social networks, namely: new friendships, academic purposes, social connectedness, following and monitoring others, entertainment, self-expression, dating, social recognition, and information (Pertegal et al., 2019).

Prior to running the regression analyses, it was necessary to establish all assumptions, namely the scale of measure, normality, homoscedasticity, linearity, multicollinearity, and independence of observations (Howell, 2016). Given that the assumption for normality was violated for three of the SMU-SNS subscales (dating social recognition, and information), several transformations and dichotomisation were carried out in order to derive symmetrically shaped distributions (Howell, 2016). Social recognition was transformed using a square root transformation; information was transformed using a square transformation; and dating was not able to be transformed and was therefore converted to a dichotomous (binary) variable and entered into the regression equation as a dummy variable (Draper & Smith, 1998). The normal probability plot (P-P) and scatterplot for each model were examined to confirm the assumptions of homoscedasticity and linearity (Tabachnick & Fidell, 2013). All P-P plots showed points directly on or relatively close to the straight diagonal lines and all scatterplots were evenly scattered from left to right (Field, 2018). Standard residuals analyses

were performed on the data to detect any outliers, and the results showed that none of the participants needed to be removed (Montgomery et al., 2013). Relative to multicollinearity, 24 out of 27 predictive models produced tolerance values less than 0.100, VIF values below 5, and condition indices below 30 (Alin, 2010; Daoud, 2017; Tabachnick & Fidell, 2013), with the exception of the three predictive models for SMU-SNS dating. The tolerance and VIF values were minimally raised for these models, indicating that multicollinearity was a slight concern. On the whole, Durbin-Watson statistics close to ± 2 were generated in all cases, indicating that there was minimal autocorrelation between the residuals for the variables (Verma & Abdel-Salam, 2019), therefore, the data met the assumption of independence of the observations. The predictive models exploring the moderating role of user motives in the social networking addiction-mental health relationships are presented in sections 4.5.1 to 4.5.9.

### *4.5.1 Predictive models with new friendships as the moderator*

As shown in Table 4.25, models 6A, 6B, and 6C explored new friendships as a moderator of the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .987 to .994; VIF values ranged from 1.006 to 1.016; and the condition index ranged from 1.015 to 1.158, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.958 for Model 6A, 2.028 for Model 6B, and 1.965 for Model 6C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

**Table 4.25**

*Predictive models for social networking addiction and depression, anxiety, and stress with new friendships as the moderator (n = 611)*

| **Model 6A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .380 | .144 | 34.066 | .000 | .000 | .801 |
| **Model 6A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.025 | 0.236 | 33.992 | .000 | 7.561 | 8.489 |
| **SNA** | 0.136 | 0.014 | 9.544 | .000 | 0.108 | 0.163 |
| **MT_NF** | 0.094 | 0.041 | 2.293 | .022 | 0.014 | 0.175 |
| **Interaction** | 0.001 | 0.002 | 0.252 | .801 | -0.004 | 0.006 |
| **Model 6B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .335 | .112 | 25.596 | .000 | .002 | .294 |
| **Model 6B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.739 | 0.204 | 32.967 | .000 | 6.338 | 7.141 |
| **SNA** | 0.097 | 0.123 | 7.919 | .000 | 0.073 | 0.122 |
| **MT_NF** | 0.096 | 0.036 | 2.702 | .007 | 0.026 | 0.166 |
| **Interaction** | -0.002 | 0.002 | -1.050 | .294 | -0.007 | 0.002 |
| **Model 6C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .365 | .133 | 31.033 | .000 | .000 | .581 |
| **Model 6C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.685 | 0.205 | 42.476 | .000 | 8.283 | 9.086 |
| **SNA** | 0.114 | 0.012 | 9.243 | .000 | 0.090 | 0.138 |
| **MT_NF** | 0.059 | 0.036 | 1.656 | .098 | -0.011 | 0.129 |
| **Interaction** | -0.001 | 0.002 | -0.553 | .581 | -0.005 | 0.003 |

*Note.* SNA = social networking addiction; MT_NF = new friendships

Model 6A was significant ($F_{3;607} = 34.066$, $p = .000$) and the coefficient of determination ($R^2 = .144$) indicated that social networking addiction, new friendships, and the interaction between these accounted for 14.4% of the variance in depression. Further, the model showed no significant interaction between social networking addiction and new friendships on depression ($b = 0.001$, $t = 0.252$, $p = .801$), thus new friendships was not a

significant moderator of the social networking addiction and depression relationship in the sample. However, both social networking addiction ($b$ = 0.136, $t$ = 9.544, $p$ = .000) and new friendships ($b$ = 0.094, $t$ = 2.293, $p$ = .022) were significant predictors of depression in the model. This indicated that each of them contributed independently and meaningfully to predicting depression levels in the sample.

Model 6B was significant ($F_{3;607}$ = 25.596; $p$ = .000) and the coefficient of determination ($R^2$ = ·112) indicated that social networking addiction, new friendships, and the interaction between these accounted for 11.2% of the variance in anxiety. No significant interaction was found between social networking addiction and new friendships on anxiety ($b$ = -0.002, $t$ = -1.050, $p$ = .294), thus new friendships was not a significant moderator of the social networking addiction and anxiety relationship in the sample. However, social networking addiction ($b$ = 0.097, $t$ = 7.919, $p$ = .000) and new friendships ($b$ = 0.096, $t$ = 2.702, $p$ = .007) were statistically significant predictors of anxiety in the model, with each contributing in a unique but significant way to predicting anxiety levels in the sample.

Model 6C was also significant ($F_{3;607}$ = 31.033; $p$ = .000) and the coefficient of determination ($R^2$ = .133) indicated that 13.3% of the variance in stress was explained by social networking addiction, new friendships, and the interaction between these. No significant interaction was seen between social networking addiction and new friendships on stress ($b$ = -0.001, $t$ = -0.553, $p$ = .581), which implied that new friendships was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, social networking addiction ($b$ = 0.114, $t$ = 9.243, $p$ = .000) on its own contributed significantly to predicting stress levels in the sample, whereas new friendships ($b$ = 0.059, $t$ = 1.656, $p$ = .098) was not a significant predictor of stress in the model.

### *4.5.2 Predictive models with academic purposes as the moderator*

**Table 4.26**

*Predictive models for social networking addiction and depression, anxiety, and stress with academic purposes as the moderator (n = 611)*

| **Model 7A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .370 | .137 | 32.166 | .000 | .001 | .498 |
| **Model 7A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.056 | 0.239 | 33.762 | .000 | 7.588 | 8.525 |
| **SNA** | 0.140 | 0.014 | 9.736 | .000 | 0.112 | 0.168 |
| **MT_ACP** | -0.012 | 0.043 | -0.287 | .775 | -0.097 | 0.072 |
| **Interaction** | -0.002 | 0.003 | -0.678 | .498 | -0.007 | 0.003 |
| **Model 7B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .324 | .105 | 23.644 | .000 | .000 | .699 |
| **Model 7B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.704 | 0.207 | 32.438 | .000 | 6.299 | 7.110 |
| **SNA** | 0.098 | 0.125 | 7.843 | .000 | 0.073 | 0.122 |
| **MT_ACP** | 0.062 | 0.037 | 1.656 | .098 | -0.012 | 0.135 |
| **Interaction** | 0.001 | 0.002 | 0.387 | .699 | -0.004 | 0.005 |
| **Model 7C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .367 | .135 | 31.476 | .000 | .001 | .473 |
| **Model 7C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.650 | 0.206 | 42.064 | .000 | 8.246 | 9.054 |
| **SNA** | 0.112 | 0.012 | 9.001 | .000 | 0.087 | 0.136 |
| **MT_ACP** | 0.073 | 0.037 | 1.961 | .050 | -0.000 | 0.146 |
| **Interaction** | 0.002 | 0.002 | 0.718 | .473 | -0.003 | 0.006 |

*Note.* SNA = social networking addiction; MT_ACP = academic purposes

As shown in Table 4.26, Model 7A, 7B, and 7C looked at whether academic purposes played a moderating role in the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .964 to .982; VIF values ranged from 1.019 to 1.037; and the condition index ranged from 1.015 to 1.256, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick &

Fidell, 2013). The Durbin-Watson statistic was 1.972 for Model 7A, 2.031 for Model 7B, and 1.967 for Model 7C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 7A was significant ($F_{3;607}$ = 32.166, $p$ = .000) and the coefficient of determination ($R^2$ = .137) indicated that social networking addiction, academic purposes, and the interaction between these accounted for 13.7% of the variance in depression. Further, no significant interaction was noted between social networking addiction and academic purposes on depression ($b$ = -0.002, $t$ = -0.678, $p$ = .498), indicating that academic purposes was not a significant moderator of the social networking addiction and depression relationship in the sample. Furthermore, social networking addiction ($b$ = 0.140, $t$ = 9.736, $p$ = .000) on its own contributed significantly to predicting depression levels in the sample, whereas academic purposes ($b$ = -0.012, $t$ = -0.287, $p$ = .775) was not a significant predictor of depression in the model.

Model 7B was significant ($F_{3;607}$ = 23.644; $p$ = .000) and the coefficient of determination ($R^2$ = .105) indicated that 10.5% of the variance in anxiety was explained by social networking addiction, academic purposes, and the interaction between these. Further, there was no significant interaction between social networking addiction and academic purposes on anxiety ($b$ = 0.001, $t$ = 0.387, $p$ = .699), thus suggesting that academic purposes was not a significant moderator of the social networking addiction and anxiety relationship in the sample. Furthermore, social networking addiction ($b$ = 0.098, $t$ = 7.843, $p$ = .000) on its own contributed significantly to predicting anxiety levels in the sample, whereas academic purposes ($b$ = 0.062, $t$ = 1.656, $p$ = .098) was not a significant predictor of anxiety in the model.

Model 7C was also significant ($F_{3;607}$ = 31.476; $p$ = .000) and the coefficient of determination ($R^2$ = .135) indicated that social networking addiction, academic purposes, and

the interaction between these accounted for 13.5% of the variance in stress. No significant interaction was found between social networking addiction and academic purposes on stress ($b$ = 0.002, $t$ = 0.718, $p$ = .473) thus in the sample, academic purposes was not a significant moderator of the social networking addiction and stress relationship. Furthermore, social networking addiction ($b$ = 0.112, $t$ = 9.001, $p$ = .000) on its own contributed significantly to predicting anxiety levels in the sample, whereas academic purposes ($b$ = 0.073, $t$ = 1.961, $p$ = .050) was not a significant predictor of anxiety in the model.

### *4.5.3 Predictive models with social connectedness as the moderator*

Models 8A, 8B, and 8C in Table 4.27 looked at whether social connectedness played a moderating role in the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .879 to .989; VIF values ranged from 1.011 to 1.138; and the condition index ranged from 1.040 to 1.480, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.958 for Model 8A, 2.024 for Model 8B, and 1.966 for Model 8C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 8A was significant ($F_{3;607}$ = 32.927, $p$ = .000) and the coefficient of determination ($R^2$ = .140) indicated that 14.0% of the variance in depression was explained by social networking addiction, social connectedness, and the interaction between these. However, there was no significant interaction between social networking addiction and social connectedness on depression ($b$ = 0.000, $t$ = 0.137, $p$ = .891), thus in the sample, social connectedness was not a significant moderator of the social networking addiction and depression relationship. Furthermore, social networking addiction ($b$ = 0.131, $t$ = 8.719, $p$ = .000) on its own contributed significantly to predicting depression levels in the sample,

whereas social connectedness ($b$ = 0.074, $t$ = 1.573, $p$ = .116) was not a significant predictor of depression in the model.

**Table 4.27**

*Predictive models for social networking addiction and depression, anxiety, and stress with social connectedness as the moderator (n = 611)*

| **Model 8A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .374 | .140 | 32.927 | .000 | .000 | .891 |
| **Model 8A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.021 | 0.247 | 32.414 | .000 | 7.535 | 8.507 |
| **SNA** | 0.131 | 0.015 | 8.719 | .000 | 0.101 | 0.160 |
| **MT_SCC** | 0.074 | 0.047 | 1.573 | .116 | -0.018 | 0.166 |
| **Interaction** | 0.000 | 0.003 | 0.137 | .891 | -0.005 | 0.005 |
| **Model 8B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .326 | .106 | 24.020 | .000 | .001 | .479 |
| **Model 8B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.764 | 0.215 | 31.533 | .000 | 6.343 | 7.185 |
| **SNA** | 0.094 | 0.013 | 7.199 | .000 | 0.068 | 0.119 |
| **MT_SCC** | 0.070 | 0.041 | 1.731 | .084 | -0.010 | 0.150 |
| **Interaction** | -0.002 | 0.002 | -0.709 | .479 | -0.006 | 0.003 |
| **Model 8C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .370 | .137 | 32.027 | .000 | .000 | .579 |
| **Model 8C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.709 | 0.213 | 40.825 | .000 | 8.290 | 9.128 |
| **SNA** | 0.106 | 0.013 | 8.219 | .000 | 0.081 | 0.132 |
| **MT_SCC** | 0.090 | 0.040 | 2.215 | .027 | 0.010 | 0.169 |
| **Interaction** | -0.001 | 0.002 | -0.555 | .579 | -0.006 | 0.003 |

*Note*. SNA = social networking addiction; MT_SCC = social connectedness

Model 8B was significant ($F_{3;607}$ = 24.020; $p$ = .000) and the coefficient of determination ($R^2$ = .106) indicated that social networking addiction, social connectedness, and the interaction between these accounted for 10.6% of the variance in anxiety. There was no

significant interaction between social networking addiction and social connectedness on anxiety ($b$ = -0.002, $t$ = -0.709, $p$ = .479), indicating that social connectedness was not a significant moderator of the social networking addiction and anxiety relationship in the sample. Furthermore, social networking addiction ($b$ = 0.094, $t$ = 7.199, $p$ = .000) on its own contributed significantly to predicting anxiety levels in the sample, whereas social connectedness ($b$ = 0.070, $t$ = 1.731, $p$ = .084) was not a significant predictor of anxiety in the model.

Model 8C was significant ($F_{3;607}$ = 32.027; $p$ = .000) and the coefficient of determination ($R^2$ = .137) indicated that social networking addiction, social connectedness, and the interaction between these accounted for 13.7% of the variance in stress. Further, there was no significant interaction between social networking addiction and social connectedness on stress ($b$ = -0.001, $t$ = -0.555, $p$ = .579), which suggested that in the sample, social connectedness was not a significant moderator of the social networking addiction and stress relationship. However, social networking addiction ($b$ = 0.106, $t$ = 8.219, $p$ = .000) and social connectedness ($b$ = 0.090, $t$ = 2.215, $p$ = .027) were statistically significant predictors of stress in the model; with each contributing separately and meaningfully to predicting stress levels in the sample.

### *4.5.4 Predictive models with following and monitoring others as the moderator*

As shown in Table 4.28, models 9A, 9B, and 9C explored the moderating role of following and monitoring others on the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .908 to .997; VIF values ranged from 1.003 to 1.101; and the condition index ranged from 1.022 to 1.385, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.965 for Model 9A, 2.043 for

Model 9B, and 2.001 for Model 9C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

**Table 4.28**

*Predictive models for social networking addiction and depression, anxiety, and stress with following and monitoring others as the moderator (n = 611)*

| **Model 9A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .378 | .143 | 33.645 | .000 | .002 | .279 |
| **Model 9A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 7.958 | 0.245 | 32.540 | .000 | 7.478 | 8.438 |
| **SNA** | 0.132 | 0.015 | 8.891 | .000 | 0.103 | 0.161 |
| **MT_FMO** | 0.081 | 0.046 | 1.765 | .078 | -0.009 | 0.171 |
| **Interaction** | 0.003 | 0.003 | 1.083 | .279 | -0.002 | 0.008 |
| **Model 9B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .326 | .106 | 24.059 | .000 | .000 | .887 |
| **Model 9B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.709 | 0.212 | 31.600 | .000 | 6.292 | 7.125 |
| **SNA** | 0.094 | 0.013 | 7.293 | .000 | 0.069 | 0.119 |
| **MT_FMO** | 0.078 | 0.040 | 1.969 | .049 | 0.000 | 0.157 |
| **Interaction** | 0.000 | 0.002 | 0.143 | .887 | -0.004 | 0.005 |
| **Model 9C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .404 | .163 | 39.521 | .000 | .003 | .170 |
| **Model 9C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.594 | 0.208 | 41.343 | .000 | 8.185 | 9.002 |
| **SNA** | 0.099 | 0.013 | 7.843 | .000 | 0.074 | 0.124 |
| **MT_FMO** | 0.187 | 0.039 | 4.802 | .000 | 0.111 | 0.264 |
| **Interaction** | 0.003 | 0.002 | 1.374 | .170 | -0.001 | 0.007 |

*Note.* SNA = social networking addiction; MT_FMO = following and monitoring others

Model 9A was significant ($F_{3;607}$ = 33.645, $p$.= .000) and the coefficient of determination ($R^2$ = .143) indicated that social networking addiction, following and monitoring others, and the interaction between these accounted for 14.3% of the variance in

depression. Further, there was no significant interaction between social networking addiction and following and monitoring others on depression ($b$ = 0.003, $t$ = 1.083, $p$ = .279), thus following and monitoring others was not a significant moderator of the social networking addiction and depression relationship in the sample. Furthermore, social networking addiction ($b$ = .132, $t$ = 8.891, $p$ = .000) on its own contributed significantly to predicting depression levels in the sample whereas following and monitoring others ($b$ = .081, $t$ = 1.765, $p$ = .078) was not a significant predictor of depression in the model.

Model 9B explored the moderating role of following and monitoring others on the relationship between social networking addiction and anxiety. Results indicated that the overall model was significant ($F_{3;607}$ = 24.059; $p$ = .000) and the coefficient of determination ($R^2$ = .106) indicated that social networking addiction, following and monitoring others, and the interaction between these accounted for 10.6% of the variance in anxiety. There was no significant interaction between social networking addiction and following and monitoring others on anxiety ($b$ = .000, $t$ = .143, $p$ = .887), thus following and monitoring others was not a significant moderator of the social networking addiction and anxiety relationship in the sample. However, social networking addiction ($b$ = .094, $t$ = 7.293, $p$ = .000) and following and monitoring others ($b$ = .078, $t$ = 1.969, $p$ = .049) were both statistically significant predictors of anxiety in the model, indicating that each of these variables contributed in a unique but significant way to predicting anxiety levels in the sample.

Model 9C was significant ($F_{3;607}$ = 39.521; $p$ = .000) and the coefficient of determination ($R^2$ = .163) indicated that social networking addiction, following and monitoring others, and the interaction between these accounted for 16.3% of the variance in stress. Further, there was no significant interaction between social networking addiction and following and monitoring others on stress ($b$ = .003, $t$ = 1.374, $p$ = .170), thus following and monitoring others was not a significant moderator of the social networking addiction and stress

relationship in the sample. However, social networking addiction ($b$ = .099, $t$ = 7.843, $p$ = .000) and following and monitoring others ($b$ = .187, $t$ = 4.802, $p$ = .000) were both statistically significant predictors of stress in the model, indicating that each of these variables contributed in a unique but significant way to predicting stress levels in the sample.

### *4.5.5 Predictive models with entertainment as the moderator*

**Table 4.29**

*Predictive models for social networking addiction and depression, anxiety, and stress with entertainment as the moderator (n = 611)*

| **Model 10A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .375 | .140 | 33.003 | .000 | .000 | .812 |
| **Model 10A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.005 | 0.260 | 30.818 | .000 | 7.495 | 8.515 |
| **SNA** | 0.127 | 0.016 | 7.939 | .000 | 0.096 | 0.158 |
| **MT_ENT** | 0.098 | 0.062 | 1.578 | .115 | -0.024 | 0.219 |
| **Interaction** | 0.001 | 0.003 | 0.238 | .812 | -0.006 | 0.007 |
| **Model 10B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .322 | .103 | 23.336 | .000 | .000 | .802 |
| **Model 10B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.741 | 0.226 | 29.887 | .000 | 6.298 | 7.184 |
| **SNA** | 0.094 | 0.014 | 6.740 | .000 | 0.066 | 0.121 |
| **MT_ENT** | 0.062 | 0.054 | 1.162 | .246 | -0.043 | 0.168 |
| **Interaction** | -0.001 | 0.003 | -0.251 | .802 | -0.006 | 0.005 |
| **Model 10C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .361 | .130 | 30.305 | .000 | .000 | .980 |
| **Model 10C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.670 | 0.225 | 38.569 | .000 | 8.229 | 9.112 |
| **SNA** | 0.110 | 0.014 | 7.941 | .000 | 0.083 | 0.137 |
| **MT_ENT** | 0.050 | 0.054 | 0.942 | .347 | -0.055 | 0.155 |
| **Interaction** | 0.000 | 0.003 | 0.025 | .980 | -0.005 | 0.006 |

*Note.* SNA = social networking addiction; MT_ENT = entertainment

Models 10A, 10B, and 10C in Table 4.29 looked at whether entertainment played a moderating role in the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .677 to .841; VIF values ranged from 1.189 to 1.477; and the condition index ranged from 1.135 to 2.049, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.968 for Model 10A, 2.040 for Model 10B, and 1.980 for Model 10C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 10A was significant ($F_{3;607}$ = 33.003, $p$ = .000) and the coefficient of determination ($R^2$ = .140) indicated that social networking addiction, entertainment, and the interaction between these accounted for 14.0% of the variance in depression. Further, the model showed no significant interaction between social networking addiction and entertainment on depression ($b$ = 0.001, $t$ = 0.238, $p$ = .812), thus indicating that entertainment was not a significant moderator of the social networking addiction and depression relationship in the sample. Furthermore, social networking addiction ($b$ = 0.127, $t$ = 7.939, $p$ = .000) on its own contributed significantly to predicting depression levels in the sample, whereas entertainment ($b$ = 0.098, $t$ = 1.578, $p$ = .115) was not a significant predictor of depression in the model.

Model 10B was also significant ($F_{3;607}$ = 23.336, $p$ = .000) and the coefficient of determination ($R^2$ = .103) indicated that social networking addiction, entertainment, and the interaction between these accounted for 10.3% of the variance in anxiety. Further, there was no significant interaction between social networking addiction and entertainment on anxiety ($b$ = -0.001, $t$ = -0.251, $p$ = .802), thus indicating that entertainment was not a significant moderator of the social networking addiction and anxiety relationship in the sample.

Furthermore, on its own, social networking addiction was significant ($b$ = 0.094, $t$ = 6.740, $p$ = .000) and played a meaningful role in predicting levels of anxiety in the sample, however, entertainment ($b$ = 0.062, $t$ = 1.162, $p$ = .246) was not a significant predictor of anxiety in the model.

Model 10C was significant ($F_{3;607}$ = 30.305, $p$ = .000) and the coefficient of determination ($R^2$ = .130) indicated that social networking addiction, entertainment, and the interaction between these accounted for 13.0% of the variance in stress. There was no significant interaction between social networking addiction and entertainment on stress ($b$ = 0.000, $t$ = 0.025, $p$ = .980), therefore entertainment was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.110, $t$ = 7.941, $p$ = .000) and played a meaningful role in predicting levels of stress in the sample, whereas entertainment ($b$ = 0.050, $t$ = 0.942, $p$ = .347) was not a significant predictor of stress in the model.

### *4.5.6 Predictive models with self-expression as the moderator*

Models 11A, 11B, and 11C in Table 4.30 tested whether self-expression played a moderating role in the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .977 to .993; VIF values ranged from 1.007 to 1.024; and the condition index ranged from 1.012 to 1.193, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.963 for Model 11A, 2.035 for Model 11B, and 1.975 for Model 11C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

**Table 4.30**

*Predictive models for social networking addiction and depression, anxiety, and stress with self-expression as the moderator (n = 611)*

| **Model 11A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .371 | .138 | 32.215 | .000 | .000 | .431 |
| **Model 11A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.007 | 0.238 | 33.676 | .000 | 7.540 | 8.473 |
| **SNA** | 0.139 | 0.014 | 9.724 | .000 | 0.111 | 0.167 |
| **MT_SLF** | 0.002 | 0.417 | 0.043 | .966 | -0.080 | 0.084 |
| **Interaction** | 0.002 | 0.002 | 0.788 | .431 | -0.003 | 0.007 |
| **Model 11B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .321 | .103 | 23.276 | .000 | .000 | .683 |
| **Model 11B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.728 | 0.206 | 32.640 | .000 | 6.323 | 7.133 |
| **SNA** | 0.099 | 0.012 | 7.970 | .000 | 0.075 | 0.123 |
| **MT_SLF** | 0.047 | 0.036 | 1.300 | .194 | -0.024 | 0.118 |
| **Interaction** | -0.001 | 0.002 | -0.409 | .683 | -0.005 | 0.003 |
| **Model 11C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .359 | .129 | 29.935 | .000 | .000 | .914 |
| **Model 11C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.670 | 0.206 | 42.172 | .000 | 8.266 | 9.074 |
| **SNA** | 0.116 | 0.012 | 9.411 | .000 | 0.092 | 0.141 |
| **MT_SLF** | -0.009 | 0.036 | -0.239 | .812 | -0.079 | 0.062 |
| **Interaction** | 0.000 | 0.002 | 0.108 | .914 | -0.004 | 0.004 |

*Note.* SNA = social networking addiction; MT-SLF = self-expression

Model 11A was significant ($F_{3;607}$ = 32.215, $p$ = .000) and the coefficient of determination ($R^2$ = .138) indicated that 13.8% of the variance in depression was explained by social networking addiction, self-expression, and the interaction between these. There was no significant interaction between social networking addiction and self-expression on depression ($b$ = 0.002, $t$ = 0.788, $p$ = .431), thus self-expression was not a significant

moderator of the social networking addiction and depression relationship in the sample. Furthermore, social networking addiction ($b$ = 0.139, $t$ = 9.724, $p$ = .000) on its own contributed significantly to predicting depression levels in the sample, whereas self-expression ($b$ = 0.002, $t$ = 0.043, $p$ = .966) was not a significant predictor of depression in the model.

Model 11B tested the moderating role of self-expression on the relationship between social networking addiction and anxiety. Results indicated that the overall predictive model was significant ($F_{3;607}$ = 23.276, $p$ = .000) and the coefficient of determination ($R^2$ = .103) indicated that self-expression, social networking addiction, and the interaction between these accounted for 10.3% of the variance in anxiety. There was no significant interaction between social networking addiction and self-expression on anxiety ($b$ = -0.001, $t$ = -0.409, $p$ = .683), thus self-expression was not a significant moderator of the social networking addiction and anxiety relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.099, $t$ = 7.970, $p$ = .000) and played a meaningful role in predicting levels of anxiety in the sample, whereas self-expression ($b$ = 0.047, $t$ = 1.300, $p$ = .194) was not a significant predictor of anxiety in the model.

Lastly, model 11C looked at whether self-expression was a significant moderator of the relationship between social networking addiction and stress. Overall, the predictive model was significant ($F_{3;607}$ = 29.935; $p$ = .000) and the coefficient of determination ($R^2$ = .129) indicated that 12.9% of the variance in stress was explained by social networking addiction, self-expression, and the interaction between these. There was no significant interaction between social networking addiction and self-expression on stress ($b$ = 0.002, $t$ = 0.108, $p$ = .914), thus self-expression was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.116, $t$ = 9.411, $p$ = .000) and played a meaningful role in

predicting levels of stress in the sample, whereas self-expression ($b$ = -0.009, $t$ = -0.239, $p$ = .812) was not a significant predictor of stress in the model.

### *4.5.7 Predictive models with dating as the moderator*

**Table 4.31**

*Predictive models for social networking addiction and depression, anxiety, and stress with dating as the moderator (n = 611)*

| **Model 12A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .375 | .141 | 33.135 | .000 | .001 | .474 |
| **Model 12A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.943 | 0.725 | 9.582 | .000 | 5.520 | 8.366 |
| **SNA** | 0.107 | 0.044 | 2.460 | .014 | 0.022 | 0.193 |
| **MT_DAT** | 0.745 | 0.477 | 1.564 | .119 | -0.191 | 1.681 |
| **Interaction** | 0.021 | 0.029 | 0.716 | .474 | -0.036 | 0.077 |
| **Model 12B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .333 | .111 | 25.241 | .000 | .001 | .456 |
| **Model 12B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 5.197 | 0.627 | 8.294 | .000 | 3.967 | 6.428 |
| **SNA** | 0.072 | 0.038 | 1.902 | .058 | -0.002 | 0.146 |
| **MT_DAT** | 1.046 | 0.412 | 2.538 | .011 | 0.237 | 1.855 |
| **Interaction** | 0.019 | 0.025 | 0.746 | .456 | -0.030 | 0.067 |
| **Model 12C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .362 | .131 | 30.474 | .000 | .001 | .563 |
| **Model 12C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.037 | 0.627 | 12.817 | .000 | 6.805 | 9.268 |
| **SNA** | 0.094 | 0.038 | 2.497 | .013 | 0.020 | 0.168 |
| **MT_DAT** | 0.434 | 0.412 | 1.052 | .293 | -0.376 | 1.244 |
| **Interaction** | 0.014 | 0.025 | 0.580 | .563 | -0.034 | 0.063 |

*Note.* SNA = social networking addiction; MT_DAT = dating

Models 12A, 12B, and 12C in Table 4.31 investigated whether dating played a moderating role in the relationships between social networking addiction and depression,

anxiety, and stress. For these models, tolerance values ranged from .105 to .990; VIF values ranged from 1.010 to 9.494; and the condition index ranged from 1.033 to 6.118, indicating that multicollinearity was a slight concern in the models (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.962 for Model 12A, 2.032 for Model 12B, and 1.964 for Model 12C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 12A was significant ($F_{3;607} = 33.135$; $p = .000$) and the coefficient of determination ($R^2 = .141$) indicated that 14.1% of the variance in depression was explained by social networking addiction, dating, and the interaction between these. There was no significant interaction between social networking addiction and dating on depression ($b = 0.021$, $t = 0.716$, $p = .474$) thus dating was not a significant moderator of the social networking addiction and depression relationship in the sample. Furthermore, social networking addiction ($b = 0.107$, $t = 2.460$, $p = .014$) on its own contributed meaningfully to predicting depression levels in the sample, whereas dating ($b = 0.745$, $t = 1.564$, $p = .119$) was not a significant predictor of depression in the model.

In model 12B, the moderating role of dating on the relationship between social networking addiction and anxiety was tested. Results indicated that the model was significant ($F_{3;607} = 25.242$; $p = .000$) and the coefficient of determination ($R^2 = .111$) indicated that social networking addiction, dating, and the interaction between these accounted for 11.1% of the variance in anxiety. There was no significant interaction between social networking addiction and dating on anxiety ($b = 0.019$, $t = 0.746$, $p = .456$), showing that dating was not a significant moderator of the social networking addiction and anxiety relationship in the sample. Furthermore, on its own, dating was significant ($b = 1.046$, $t = 2.538$, $p = .011$) and played a meaningful role in predicting levels of anxiety in the sample, however, social

networking addiction ($b$ = 0.072, $t$ = 1.902, $p$ = .058) was not a significant predictor of anxiety in the model.

Model 12C looked at whether dating was a significant moderator of the relationship between social networking addiction and stress. The overall model was significant ($F_{3;607}$ = 30.474; $p$ = .000) where the coefficient of determination ($R^2$ = .131) indicated that 13.1% of the variance in stress was explained by social networking addiction, dating, and the interaction between these. No significant interaction was seen between social networking addiction and dating on stress ($b$ = 0.014, $t$ = 0.580, $p$ = .563), showing that dating was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.094, $t$ = 2.497, $p$ = .013) and played a meaningful role in predicting levels of stress in the sample, however dating ($b$ = 0.434, $t$ = 1.052, $p$ = .293) was not a significant predictor of stress in the model.

### *4.5.8 Predictive models with social recognition as the moderator*

Models 13A, 13B, and 13C in Table 4.32 investigated whether social recognition played a moderating role in the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .872 to .946; VIF values ranged from 1.057 to 1.147; and the condition index ranged from 1.128 to 1.526, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.969 for Model 13A, 2.042 for Model 13B, and 1.973 for Model 13C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

**Table 4.32**

*Predictive models for social networking addiction and depression, anxiety, and stress with social recognition as the moderator (n = 611)*

| **Model 13A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .374 | .140 | 32.853 | .000 | .001 | .566 |
| **Model 13A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 7.993 | 0.245 | 32.668 | .000 | 7.512 | 8.473 |
| **SNA** | 0.132 | 0.015 | 8.944 | .000 | 0.103 | 0.162 |
| **MT_SRG** | 0.389 | 0.313 | 1.244 | .214 | -0.225 | 1.004 |
| **Interaction** | 0.010 | 0.017 | 0.575 | .566 | -0.024 | 0.043 |
| **Model 13B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .326 | .107 | 24.105 | .000 | .002 | .198 |
| **Model 13B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.791 | 0.212 | 32.032 | .000 | 6.375 | 7.208 |
| **SNA** | 0.096 | 0.013 | 7.481 | .000 | 0.071 | 0.121 |
| **MT_SRG** | 0.482 | 0.271 | 1.778 | .076 | -0.050 | 1.015 |
| **Interaction** | -0.019 | 0.015 | -1.287 | .198 | -0.048 | 0.010 |
| **Model 13C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .366 | .134 | 31.258 | .000 | .000 | .749 |
| **Model 13C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.691 | 0.211 | 41.142 | .000 | 8.276 | 9.106 |
| **SNA** | 0.109 | 0.013 | 8.541 | .000 | 0.084 | 0.134 |
| **MT_SRG** | 0.507 | 0.270 | 1.875 | .061 | -0.024 | 1.038 |
| **Interaction** | -0.005 | 0.015 | -0.320 | .749 | -0.033 | 0.024 |

*Note.* SNA = social networking addiction; MT_SRG = social recognition

Model 13A was significant ($F_{3;607}$ = 32.853; $p$ = .000) and the coefficient of determination ($R^2$ = .140) indicated that 14% of the variance in depression was explained by social networking addiction, social recognition, and the interaction between these. There was no significant interaction between social networking addiction and social recognition on depression ($b$ = 0.010, $t$ = 0.575, $p$ = .566), thus, in the sample, social recognition was not a significant moderator of the social networking addiction and depression relationship.

Furthermore, social networking addiction ($b$ = 0.132, $t$ = 8.944, $p$ = .000) on its own contributed meaningfully to predicting depression levels in the sample, whereas social recognition ($b$ = 0.389, $t$ = 1.244, $p$ = .214) was not a significant predictor of depression in the model.

Results indicated that model 13B was significant ($F_{3;607}$ = 24.105, $p$ = .000) and the coefficient of determination ($R^2$ = .107) indicated that social networking addiction, social recognition, and the interaction between these accounted for 10.7% of the variance in anxiety. There was no significant interaction between social networking addiction and social recognition on anxiety ($b$ = -0.019, $t$ = -1.287, $p$ = .198), showing that social recognition was not a significant moderator of the social networking addiction and anxiety association in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.096, $t$ = 7.481, $p$ = .000) and played a meaningful role in predicting levels of anxiety in the sample, whereas social recognition ($b$ = 0.482, $t$ = 1.778, $p$ = .076) was not a significant predictor of anxiety in the model.

Model 13C looked at whether social recognition was a significant moderator of the relationship between social networking addiction and stress. The model was significant ($F_{3;607}$ = 31.258, $p$ = .000) and the coefficient of determination ($R^2$ = .134) indicated that 13.4% of the variance in stress was explained by social networking addiction, social recognition, and the interaction between these. No significant interaction was seen between social networking addiction and social recognition on stress ($b$ = -0.005, $t$ = -0.320, $p$ = .749) thus social recognition was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.109, $t$ = 8.541, $p$ = .000) and played a meaningful role in predicting levels of stress in the sample, however social recognition ($b$ = 0.507, $t$ = 1.875, $p$ = .061) was not a significant predictor of stress in the model.

### *4.5.9 Predictive models with information as the moderator*

**Table 4.33**

*Predictive models for social networking addiction and depression, anxiety, and stress with information as the moderator (n = 611)*

| **Model 14A Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
|---|---|---|---|---|---|---|
| | .372 | .139 | 32.560 | .000 | .001 | .335 |
| **Model 14A** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.074 | 0.240 | 33.676 | .000 | 7.604 | 8.545 |
| **SNA** | 0.141 | 0.014 | 9.776 | .000 | 0.113 | 0.169 |
| **MT_INF** | -0.002 | 0.002 | -0.967 | .334 | -0.006 | 0.002 |
| **Interaction** | -0.000 | 0.000 | -0.965 | .335 | -0.000 | 0.000 |
| **Model 14B Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .324 | .105 | 23.680 | .000 | .000 | .899 |
| **Model 14B** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 6.712 | 0.208 | 32.294 | .000 | 6.304 | 7.120 |
| **SNA** | 0.097 | 0.013 | 7.780 | .000 | 0.073 | 0.122 |
| **MT_INF** | 0.003 | 0.002 | 1.678 | .094 | -0.001 | 0.006 |
| **Interaction** | 0.000 | 0.000 | 0.127 | .899 | -0.000 | 0.000 |
| **Model 14C Summary** | **R** | **$R^2$** | **F** | **Sig.** | **$R^2$ change** | **Sig. $R^2$ change** |
| | .359 | .129 | 29.935 | .000 | .000 | .965 |
| **Model 14C** | **B** | **Std. Error** | **t** | **Sig.** | **LLCI** | **ULCI** |
| **Constant** | 8.671 | 0.208 | 41.792 | .000 | 8.264 | 9.078 |
| **SNA** | 0.115 | 0.013 | 9.250 | .000 | 0.091 | 0.140 |
| **MT_INF** | 0.000 | 0.002 | 0.256 | .798 | -0.003 | 0.004 |
| **Interaction** | 0.000 | 0.000 | 0.044 | .965 | -0.000 | 0.000 |

*Note.* SNA = social networking addiction; MT_INF = information

Models 14A, 14B, and 14C in Table 4.33 looked at whether information played a moderating role in the relationships between social networking addiction and depression, anxiety, and stress. For these models, tolerance values ranged from .916 to .964; VIF values

ranged from 1.038 to 1.092; and the condition index ranged from 1.110 to 1.400, indicating that multicollinearity was not a concern (Montgomery et al., 2013; Tabachnick & Fidell, 2013). The Durbin-Watson statistic was 1.967 for Model 14A, 2.026 for Model 14B, and 1.974 for Model 14C, indicating that in all cases, there was minimal autocorrelation between the residuals for the variables (Kenton, 2021).

Model 14A prediction was significant ($F_{3;607}$ = 32.560, $p$ = .000) and the coefficient of determination ($R^2$ = .139) indicated that 13.9% of the variance in depression was explained by social networking addiction, information, and the interaction between these. No significant interaction was seen between social networking addiction and information on depression ($b$ = -0.000, $t$ = -0.965, $p$ = .335) thus information was not a significant moderator of the social networking addiction and depression relationship in the sample. Furthermore, social networking addiction ($b$ = 0.141, $t$ = 9.776, $p$ = .000) on its own contributed meaningfully to predicting depression levels in the sample, whereas information ($b$ = -0.002, $t$ = -0.967, $p$ = .334) was not a significant predictor of depression in the model.

Results indicated that Model 14B was significant ($F_{3;607}$ = 23.680, $p$ = .000) and the coefficient of determination ($R^2$ = .105) indicated that social networking addiction, information, and the interaction between these accounted for 10.5% of the variance in anxiety. There was no significant interaction between social networking addiction and information on anxiety ($b$ = 0.000, $t$ = 0.127, $p$ = .899) thus information was not a significant moderator of the relationship between social networking addiction and anxiety in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.097, $t$ = 7.780, $p$ = .000), playing a meaningful role in predicting levels of anxiety in the sample, however, information ($b$ = 0.003, $t$ = 1.678, $p$ = .094) was not a significant predictor of anxiety in the model.

Model 14C looked at whether information was a significant moderator of the relationship between social networking addiction and stress. The model was significant ($F_{3;607}$ = 29.935, $p$ = .000) and the coefficient of determination ($R^2$ = .129) indicated that 12.9% of the variance in stress was explained by social networking addiction, information, and the interaction between these. No significant interaction was noted between social networking addiction and information on stress ($b$ = 0.000, $t$ = 0.044, $p$ = .965), therefore information was not a significant moderator of the social networking addiction and stress relationship in the sample. Furthermore, on its own, social networking addiction was significant ($b$ = 0.115, $t$ = 9.250, $p$ = .000), playing a meaningful role in predicting levels of stress in the sample, however, information ($b$ = 0.000, $t$ = 0.256, $p$ = .798) was not a significant predictor of stress in the model.

### *4.5.10 Conclusion*

To conclude, none of the user motives assessed in the study acted as moderators of the relationships between social networking addiction and depression, stress, and anxiety in the sample. Social networking addiction remained a consistent predictor of mental health across all the models, with a single exception for the model that explored whether a motive for dating moderated the relationship between social networking addiction and mental health. A motive for using social networks to make new friends significantly predicted both depression and anxiety in the sample, but did not significantly predict levels of stress; while a motive to obtain social connectedness significantly predicted stress levels in the sample, but did not predict depression or anxiety. Following and monitoring others significantly predicted both anxiety and stress, but not depression; and a dating motive significantly predicted anxiety levels but not depression or stress in the sample. Five motives assessed in the study, namely:

academic purposes, entertainment, self-expression, social recognition, and information, did not significantly predict any aspect of mental health in the sample.

### 4.6 Qualitative Data

For the qualitative section of the survey, information was gathered by asking the participants a set of predetermined, open-ended questions to obtain their written responses. Three questions were selected for analysis that most closely aligned with addressing the seventh research question re participants' perceptions of using social networking and how this relates to their mental health. These questions were:

- If you use social networking sites, how does using these make you feel?
- If you use social networking sites, does using these ever make you feel unhappy or anxious? Please give a brief explanation for your answer.
- Are there ever times when you feel that you are too involved with social networking sites? Please give a brief explanation for your answer.

Conventional content analysis was conducted in order to analyse the data from these questions (Hsieh & Shannon, 2005). Data coding in MS Excel© was used to analyse the responses to these questions in order to determine categories linked to brief themes as well as frequencies associated with these categories. To find trends in the data, the initial categories were then grouped into clusters (Hsieh & Shannon, 2005). These clusters were then reviewed and categorised into themes for discussion, with quotes selected to express these themes in the participants' own words (Figgou & Pavlopoulos, 2015).

For the question regarding how using social networking sites made participants feel, 471 (77.0%) responses from the sample (n = 612) were interpreted, 131 (21.4%) respondents chose not to answer the question, and 10 (1.6%) answers were discarded on grounds of

irrelevance. This question was centred on participants' feelings while using social media platforms. Commonly occurring themes such as "feel normal", "don't feel anything", "relaxed", "good", "happy", "entertained" , "distracted", "drained", "insecure and depressed", "up to date", and "connected" generated five broader categories: indifference, positive emotions, negative emotions, mixed emotions, and a sense of being connected and informed.

**Table 4.34**

*Themes and categories for feelings when using social networking sites*

| Theme description | Category | Frequency | Percentage |
|---|---|---|---|
| Neutral; nothing; normal; no change; indifferent | Indifference | 81 | 13.2% |
| Okay; relaxed; not bored, entertained; good; happy | Positive emotions | 170 | 27.8% |
| Distracted; drained; insecure; depressed; bored | Negative emotions | 50 | 8.2% |
| Depends on contents/ interactions/ mood | Mixed emotions | 132 | 21.6% |
| Informed; connected; sense of community | Connected and informed | 38 | 6.2% |
| | Complete responses | 471 | 77.0% |
| | Missing responses | 131 | 21.4% |
| | Discarded responses | 10 | 1.6% |
| | Total | 612 | 100% |

As shown in Table 4.34, 81 (13.2%) responses fell into the category of indifference, showing that the respondents in one way or another felt the same when using social networking sites. Many respondents in this category said that they felt normal, indifferent,

and that using social networking sites did not make them feel anything. Responses were fairly neutral, and participants felt that using social media was part of a daily routine showing no real feelings attached to it:

> "*I don't know. I don't really feel anything" (Participant 1, age 23, 8 sites, 2-3 hours per day.)*

> *"Normal. It has no effect on me"(Participant 369, age 18, 7 sites, 3-4 hours per day).*

> *"Not any particular way. Most times I scroll aimlessly to fill my free time" (Participant 458, age 22, 4 sites, 5-8 hours per day).*

The highest proportion of respondents indicated having positive emotions (n = 170 (27.8%)); most said that they felt relaxed and content, while others felt excited and entertained. Responses were often centred around entertainment experiences which made the participants feel gratified, engaged, and part of a community:

> *"Relaxed and happy; I am able to find things that suit my interests that can fill my spare time or help with my creativity" (Participant 466, age 21, 3 sites, 2-3 hours).*

> *"Usually quite happy and entertained. At times I even feel validated by the content someone else has made. I often feel satisfied or engaged when interacting with my friends or content that regards concepts that I enjoy. I also love the feeling of being apart of fandom spaces and feeling like I belong. The ability to joke about or theorise books or movies with people all over the world feels extremely gratifying for me" (Participant 93, age 21, 5 sites, 3-4 hours).*

> *"I am able to enjoy and laugh somewhat happy" (Participant 441, age 19, 6 sites ,4-5 hours per day).*

132 (21.6%) participants reported having mixed emotions (a combination of both positive and negative states). Some reported that they enjoyed themselves despite having feelings of guilt and worry that they spent too much time on social media. Others said that whether they felt good or bad depended on the content that they were consuming or the platform that they engaged on. Responses primarily focused on conflicting emotions: negative states were generally triggered by positive social media engagement.

> *"Often guilty as it tends to be used as a form of procrastination. However, when I have set time aside (say 1hr of youtube for example), then I enjoy it as I'm watching what I wanted to watch. I just hate when I scroll pointlessly"*
> *(Participant 292, age 19, 3 sites, 4-5 hours per day).*

> *"It depends on the day sometimes happy sometimes indifferent sometimes" concerned"(Participant 122, age 18, 6 sites, 3-4 hours per day).*

> *"Depends on my mood and what I watch it can cause anxiety ir make me happy" (Participant 399, age 22, 7 sites, 5-8 hours per day).*

> *"Each site makes me feel a different way. Instagram will make me feel insecure at times, so will Twitter because you never feel fun enough or beautiful enough. Sometimes the preaching of self-love and self-acceptance can be a bit of a drag because it may not be sincere (they may just do it for the likes or follows). TikTok is not bad, makes me happy and I haven't really felt any negativity regarding it. Sites like Insta, Twitter and Snapchat make you feel like you're lacking and sometimes, that's dangerous for some people because they could end up getting depressed - as a teenager I had some close calls, even as a young adult I have doubts but I have a higher level of clarity than I did back then" (Participant 318, age 20, 8 sites, 2-3 hours per day).*

Other participants (n = 50 (8.2%)) expressed having only negative emotions while using social media. Respondents felt that their social media engagement influenced their life satisfaction and well-being. Some participants admitted to being conscious of their misuse and believed that they were procrastinating, felt distracted, and 'hooked' by its addictive nature. This left some of them feeling depressed; others felt anxious, insecure, and unsociable. These responses also pointed out key characteristics of mindless use that included habitually monitoring social media and losing track of time when online.

> *"Like I'm procrastinating real life with it being a distraction" (Participant 84, age 21, 7 sites, 8-10 hours per day).*

> *"Not great. It's weird. I know I hate social media and that it makes me feel left out at times and insecure other times but I'm hooked. It's just become a habit of some sort" (Participant 156, age 20, 7 sites, 8-10 hours per day).*

> *"Not well - depressed and anxious" (Participant 315, age 23, 6 sites, 1-2 hours per day).*

> *"Stressed unsociable and sometimes affects my physical health" (Participant 212, age 32, 10 sites, 8-10 hours per day).*

The remaining 38 (6.2%) of the respondents reported that they felt connected, informed, and up to date through using social networks. Some expressed a need for social connection—a sense of belongingness to communities, while others felt a need to keep informed of the latest developments. Overall, respondents found that their social media engagement had a positive influence on their life satisfaction.

> *"Generally make me feel informed about what is happening in the world" (Participant 448, age 20, 6 sites, 4-5 hours per day).*

> *"It makes me feel a sense of community when I am interacting with people who have the same interests as I do" (Participant 211, age 23, 8 sites, 2-3 hours per day).*

> *"It makes me feel connected to people and satisfied to be up to date with notifications" (Participant 583, age 20, 6 sites, 30 minutes - 1 hour per day).*

For the second question regarding whether using social networking sites made the participants feel unhappy or anxious, 132 (21.6%) respondents chose not to respond to the question. Almost a third of the sample (188 (30.7%)) responded "*No*" (133 (21.7%)), or "*Yes or Sometimes*" (55 (9.0%)) without providing reasons for their experiences. Commonly occurring themes such as "time lost,", "procrastinating instead of working/studying", "peer pressure", "comparing myself to others", "bullying", "violence" , "glued to the screen", "media propaganda", "insecure and depressed", "can't stop watching", and "addicted" generated four broader categories: time wasting, social pressure, negative content, and addictive/compulsive behaviour.

**Table 4.35** *Themes and categories on social media use inducing anxiety and unhappiness.*

| Theme description | Category | Frequency | Percentage |
|---|---|---|---|
| Time lost, wasted time, too much screen time, procrastinating instead of working/studying. | Time wasting | 29 | 4.7% |
| Social comparison, validation, interpersonal conflict, bullying, peer pressure, personal attacks. | Social pressure | 167 | 27.3% |
| Media news, politics, propaganda, violence, information overload. | Negative content | 93 | 15.2% |
| Addicted, can't stop watching, glued to the screen | Addictive/ obsessive behaviour | 3 | 0.1% |
| | Non-responses | 132 | 21.6% |
| | No responses | 133 | 21.7% |
| | Yes/Sometimes (no explanation given) | 55 | 9.0% |
| | Total | 612 | 100% |

As presented in Table 4.35, 29 (4.7%) respondents explicitly stated that they were concerned about the amount of time they spent on social media; this notion of wasted time was also implied across a larger proportion of responses and pervaded other themes. Some respondents directly and indirectly reported that they were tempted to procrastinate and were concerned about the amount of time they spent on social media which made them feel upset. Others expressed that this affected their daily lives negatively in terms of academic or work productivity.

> *"I do feel like I am wasting precious time when using social media which makes me upset with myself" (Participant 559, age 23, 3 sites, 5-8 hours per day).*

> *"Yes when I have an important task to do but I am glued to the screen" (Participant 530, age 20, 7 sites, 5-8 hours per day).*

> *"Yes After wasting hours instead of working" (Participant 280, age 21, 2 sites, 2-3 hours per day).*

A further 167 (27.3%) respondents felt anxious and/or unhappy when confronted with a host of social pressures. Respondents said that they were exposed to peer pressure, mostly resulting from social comparison such as keeping up appearances, while others were exposed to bullying and unfavourable interactions with others. These respondents expressed that they witnessed people being nasty to each other, or that content was "mean and hurtful" thus discouraging them from engaging further. Another common response to this question was the need to often compare themselves to others, which brought about feelings of anxiousness and unhappiness.

> *"Sometimes social networks can make me unhappy or anxious when I see beautiful people and other material things. It makes me feel like I'm behind I'm not beautiful enough I don't dress well and sometimes make me worry about things I don't have" (Participant 250, age 29, 4 sites, 2-3 hours per day).*

> *"Unhappy yes. Anxious no. Unhappiness from using social media stems from the online bullying a erson sees and mean and hurtful content people can publish towards other people (Participant 11, age 19, 6 sites, 1-2 hours per day).*

> *"Only when people are being mean to each other I sometimes then feel like I can't express myself as people will attack me (Participant 208, age 20, 5 sites, 5-8 hours per day).*

Some respondents (93 (15.2%)) felt overwhelmed and upset by the negative content found on social media, which was accounted for by most news media reporting tragedies, violence, fear, propaganda, injustices, and death. One respondent said the sharing of news media containing traumatic events travelled faster on social media—"it goes viral". Another respondent said that negative content on social media triggered a compulsion to search for even more unpleasant and depressing news.

> *"Yes social media is often flooded with upsetting information about injustice poverty war etc. It can be overwhelming" (Participant 342, age 19, 7 sites, 2-3 hours per day).*

> *"Yes when a traumatic event happens it goes viral and one can share in this sadness or anxiety from parties involved" (Participant 60, age 31, 7 sites, 3-4 hours per day).*

> *"It does when the world is in a bad place politically because I end up doomscrolling and looking into all the bad news and getting nihilistic" (Participant 364, age 25, 7 sites, 1-2 hours per day).*

A very few respondents (3 (0.1%)) showed obsessive or compulsive proclivities towards prolonged use of social media; this was important enough to justify creating a category on its own despite the negligible amount of responses. One respondent acknowledged how addictive social media could be, while the other two expressed the urge to frequently check the amount of likes and followers they had. These actions may be attributable to compulsive behaviour.

> *"Yes, (… ) and also it is addicting which is bad. You can get so addicted that it takes up so much of your life and you lose out so much time to actually do stuff which is more productive or exciting like taking up a hobby, learning a new skill or just being with your family. Being anxious may result in you see things happening worldwide and when you get news of it, it makes you anxious about the world and life. Unhappy maybe because you realise that people get famous and get money and live these amazing lives from doing bare minimum stuff and you work so hard and might never get to that level and then you get unhappy thinking if you are doing the right thing or wish that your life went a different way" (Participant 500, age 20, 8 sites, 3-4 hours per day).*

> *Yes sometimes through comparing likes and following on instagram but luckily we can turn our likes off now. also when i have work to do it can be distracting. the anxiety part can come into play when someone i have deep feelings for performs actions on these platforms they can be triggering if you don't take care to mute or block them (Participant 524, age 18, 5 sites, 4-5 hours per day).*

> *Sometimes I do feel anxious but I have calmed down quite a bit I think it might be because I have more followers now. Which actually scares me because what if I lose them all tomorrow. Insane (Participant 574, age 21, 4 sites, 1-2 hours per day).*

The third question asked the respondents to give reasons for their over-involvement on social media, if any existed.

**Table 4.36**

*Themes and categories on overinvolvement on social media*

| Theme description | Category | Frequency | Percentage |
|---|---|---|---|
| Limited usage, do not engage, have boundaries, time management | Not overinvolved | 204 | 33.3% |
| Endless scrolling, too much time, procrastinating, unproductive at work/studies | Excessive time spent | 131 | 21.4% |
| Addictive, constantly checking, reliance, craving, habit. | Overdependence/binge-watching | 39 | 6.4% |
| Oversharing one's life stories, monitoring others, consumed by drama/ controversial topics | Emotionally invested in cause/debates/comments | 56 | 9.2% |
| Drained, depressed, stressed, loneliness, emptiness, self-isolation, self-neglect, insomnia, eyes aching. | Affecting aspects of health | 15 | 2.5% |
| | Non-responses | 132 | 21.6% |
| | Discarded responses | 35 | 5.7% |
| | Total | 612 | 100% |

As shown in Table 4.36, nearly three quarters (455 (74.3%)) of the sample provided responses to the question. However, 132 (21.6%) chose not to answer and 35 (5.7%) were discarded due to irrelevance. Commonly occurring themes such as "do not engage,", "time

management", "scrolling", "procrastinating", "distraction", "craving" , "monitoring others", "oversharing", "habit", "drained", and "depressed" generated five broader categories: not over-involved, excessive time spent, overdependence/binge-watching, emotionally invested in cause/debates/comments, and affecting aspects of health.

204 (33.3%) respondents stated that they were not too involved with social media for reasons of limited usage, setting boundaries, and managing their time effectively. They generally felt that they could regulate their social media use.

> *"Not really. I only get to social media when i have time. Once in three weeks or a month" (Participant 537, age 35, 5 sites, 15-30 minutes per day).*

> *"No. I am able to have boundaries if I feel too involved" (Participant 561, age 22, 5 sites, 2-3 hours per day).*

> *"No because I can manage my time effectively" (Participant 504, age 18, 6 sites, 4-5 hours per day).*

A further 131 (21.4%) respondents reported spending countless hours aimlessly scrolling and procrastinating, while falling behind with work or studies. Some respondents reported that they made an effort to limit their social media use, while others reported that they were overly involved on social media as a result of their inability to regulate their use.

> *"Yeah. I had a screen time use app and it was like 10 hours just on my phone. I thought that was crazy. I was wasting so much of my life on something so unproductive. What was I doing with all that time? And also it made me think that I have so much time to actually do better things but social media has this way of making 10 hours feel like 30 minutes. I would never have known that I spent so much time on social media. Thats the crazy part. And that's what I dislike." (Participant 156, age 20, 7 sites, 8-10 hours per day).*

> *"Sometimes I can spend 8 hours on social media per day and find it difficult to close the apps and continue with 'real life'."(Participant 371, age 23, 4 sites, 5-8 hours per day).*

> *"Yes when I spend half of my day on social media without getting any work done"(Participant 247, age 19, 6 sites, 3-4 hours per day).*

> *"Yes I sometimes neglect important work to be on social media and I spend more time on social media when there is more pressure or strict deadlines or when work is more stressful" (Participant 159, age 32, 7 sites, 1-2 hours per day).*

> *"Yes it wastes alot of precious time but the procrastination sometimes gets me to work- because my eyes get sore so I get into a cycle o hating myself because I couldn't control scrolling and then I'm too tired to be productive. Even if I try to take action it doesn't always work. I've found a dramatic solution that works- switching my phone off so it completely restricts me" (Participant 341, age 25, 5 sites, 5-8 hours per day).*

Several respondents (39 (6.4%)) reported feeling overly dependent on social media. These respondents reported an intense preoccupation with social media sites, failed to control their use, and sometimes experienced unpleasant feelings when they were not able to engage fully on these sites.

> *"Yes. I've been trying to deactivate but I go back in hours. I want to focus on my life but I think I'm addicted. To seeing what others are doing what's going on. Watching others e.g. vlogs is nice but time-consuming and sad sometimes. I don't see what I gain from there anymore" (Participant 126, age 28, 7 sites, 5-8 hours per day).*

> *"Yes sometimes I have to force myself to put my phone down and actually focus on what I'm doing. And I find myself picking my phone up again in a few minutes for no real reason" (Participant 127, age 27, 5 sites, 4-5 hours per day).*

> *"Yes it can become addictive or habitual" (Participant 139, age 30, 3 sites, 30 minutes-1 hour per day).*

> *"Definitely I noticed that when Facebook was down for a few hours. I felt out of place and I know that means I'm too invested" (Participant 241, age 22, 9 sites, 3-4 hours per day).*

A further 56 (9.2%) felt emotionally invested in various causes, debates, and other people's comments. Some reported that over-involving themselves by following others on social media platforms caused them to become emotionally entangled in a variety of situations. A few regretted oversharing personal information online at one point in their lives.

> *"Yes if there a story or scandal on celebrities I actually feel like I know those people and get consumed by the drama" (Participant 39, age 28, 4 sites, 3-4 hours per day).*

> *"Yeah when the US Elections came around I found myself VERY INVOLVED. I had to work my way out of that because it really wasn't any of my businesss" (Participant 48, age 24, 8 sites, 2-3 hours per day).*

> *"yes there are time like when there is some online drama with influencers they have either said something or done something very controversial and i get alarmingly invested in how the story plays out. Or when an award show happens and you get to see all the fashion on the red carpet" (Participant 433, age 19, 6 sites, 30 mins -1 hour per day).*

> *"Yes when I realised I overshare too much information about my life" (Participant 558, age 26, 9 sites, 4-5 hours per day).*

Lastly, 15 (2.5%) respondents said that over-involvement in social media sometimes affected their health. Some respondents acknowledged sometimes having various physical or mental health conditions, for example, sore eyes, stress, self-neglect, and despondency (hopelessness, and despair).

> *"Yes when I feel my eyes aching; then I know that I have been glued to the screen for a long time" (Participant 530, age 20, 7 sites, 5-8 hours per day).*

> *"Yes. When I feel overwhelmed with work I tend to procrastinate by going on social media. This does not help with my mental health and often causes more stress or despondency" (Participant 61, age 27, 7 sites, 3-4 hours per day).*

> *"Yes - when I'm not in a good space I tend to neglect myself and over indulge on social networking sites" (Participant 399, age 22, 7 sites, 5-8 hours per day).*

Overall, the findings identified that while most participants felt positively regarding the use of social networks, a good proportion of my participants expressed mixed emotions in that it depended on the content, their interactions with others or their mood at the time. On the other hand, a few expressed a need for social connection—a sense of belongingness to communities, while others felt the need to keep informed of the latest developments. Some participants were concerned about the experiences of social pressure, procrastination and wasted time, constant exposure to negative content, and the addictive nature of social media use. Other participants seemingly spent countless hours aimlessly scrolling and procrastinating, while falling behind with work or studies. The participants who experienced

an intense preoccupation with social media sites, failed to control their use and sometimes experienced unpleasant feelings when they were not able to engage fully on these sites.

### *4.6.1 Conclusion*

This chapter presented the results of the statistical analyses that were conducted to answer the research questions, including establishing internal consistency reliability for the instruments in the sample, descriptive statistics for the data obtained, and the inferential statistical techniques used to answer the research questions. The chapter also presented the findings from the conventional content analysis used to analyse important qualitative data obtained in the study. Chapter 5 will outline a review of previous research combined with a discussion of the findings of this study as well as address its implications, strengths and limitations, and directions for future research.

# CHAPTER 5

# 5 DISCUSSION

Although the utilisation of digital technologies has several demonstrated advantages, international research has suggested that the advancement of social media in the internet era has also led to unforeseen effects on psychological well-being (Andreassen, 2015; Griffiths et al., 2014; Turel & Serenko, 2012). In South Africa, research concerning social networking addiction and problematic/excessive use of social media platforms that may lead to poor mental health outcomes has been lacking. The aim of the current study, therefore, was to explore the nature of the relationships between social networking addiction, personality, user motives, and mental health outcomes in a South African sample, as well as the extent to which personality characteristics and underlying motives functioned as moderators of the relationship between social networking addiction and mental health in the sample. The study also sought to explore participants' perceptions of their use of social networking platforms and how this related to their mental health.

In this chapter, the seven research questions presented in Chapter 1 are discussed in chronological order. The chapter begins with a discussion on internal consistency reliability for each scale, followed by an interpretation of the statistical and qualitative findings of the study that incorporates a review of earlier research findings and available literature. The final section of the chapter addresses the study's strengths, limitations, and implications, and concludes with the directions for future research.

## 5.1 Internal consistency reliability of the scales

Four scales were employed in this study, namely, the Social Networking Addiction Scale (SNAS), the Depression, Anxiety, and Stress Scale (DASS-21), the Big Five Inventory (BFI), and the Scale of Motives for Using Social Networking Sites (SMU-SNS). It was important to determine scale reliability for these in the South African sample used in the study. For determining internal consistency, Cronbach Alpha represents a set of items' homogeneity and whether they consistently measure the same construct (Anastasi, 1976). Although a scale should also be evaluated against its purpose, a Cronbach's alpha of $\alpha$ =.70 is a commonly accepted level of adequacy (Hulin et al., 2001).

The psychometric properties of the Social Networking Addiction Scale (SNAS) were established internationally, and the scale was found to be psychometrically sound with reliability estimates greater than $\alpha$ = .70 for every factor (Shahnawaz & Rehman, 2020) and $\alpha$ = .93 for the composite scale (Atwan et al., 2022). This study's findings also support sound internal consistency reliability. The scale demonstrated a Cronbach Alpha coefficient of .93 for the total score (n = 611) and Cronbach Alpha coefficients of .76 for salience, .77 for mood modification, .83 for tolerance, .91 for withdrawal, .71 for conflict, and .92 for relapse. As such, the reliability estimates obtained in this study were acceptable and the results suggested that the SNAS may be regarded as a reliable instrument in the South African context.

The well-established psychometric properties of the Depression, Anxiety, and Stress Scales (DASS) have long been documented and reported since 1995 (Lovibond & Lovibond, 1995). The short-form DASS-21 was found to have good internal consistency reliability with an Alpha coefficient of .93 (Henry & Crawford, 2005), and more recently, an acceptable internal consistency of at least .70 was determined in a South African sample (Dreyer et al.,

2019). This study's findings corroborate previous research that reported strong internal consistency reliabilities for the DASS-21. The sample demonstrated alpha coefficients of .92 for depression, .83 for anxiety, and .85 for stress indicating high internal consistency reliability. Combined, the DASS-21 also had an acceptable reliability coefficient of $\alpha = .94$ in the sample showing strong interrelationships among the items (Anastasi, 1976). Thus, the DASS-21 appears to be a reliable research instrument for use in South Africa.

The internal consistency for the five dimensions of the Big Five Inventory (BFI) in this study were satisfactory with Cronbach Alpha values ranging from moderate to high (between $\alpha = .69$ and $\alpha = .82$). The following Cronbach alphas were obtained: extraversion ($\alpha = .82$), neuroticism ($\alpha = .81$), conscientiousness ($\alpha = .79$), agreeableness ($\alpha = .73$), and openness to experience ($\alpha = .69$). Although slightly lower estimates were found in comparison to North American samples which typically range from .75 to .90 (John & Srivastava, 1999), the current findings are nonetheless acceptable. The estimates in the current study were also slightly lower than those identified by Bell and Njoli (2016), who found internal consistency reliability estimates ranging between .79 and .88 for the BFI subscales in a South African sample. Despite this, the current study's findings add support for the BFI as a reliable instrument for assessing personality in South African adults.

Due to the lack of prior exploration and use of the Scale of Motives for Using Social Networking Sites (SMU-SNS) in South Africa, there is very limited information available regarding the psychometric properties of the scale in this context. This study appears to be the first to explore the internal consistency reliability of the scale in a sample of South African participants. From the study's findings, the subscales had Cronbach Alpha values ranging from .79 to .94. Overall, the scale demonstrated good internal consistency reliability for each

factor: new friendships (α = .94), academic purposes (α =.91), self-expression (α =.87), social connectedness (α =.87), entertainment (α =.86), dating (α =.85), information (α =.85), social recognition (α =.82), and following and monitoring others (α =.79). This study's findings, therefore, closely matched with the results obtained by Pertegal et al. (2019), which demonstrated Cronbach's Alpha values varying from .77 to .90 and suggested good internal consistency reliability for the scale in an international sample.

## 5.2 Social networking addiction, depression, anxiety, and stress

This section discusses the first and second research questions concerning levels of social networking addiction and levels of depression, anxiety, and stress in the sample and the nature of the relationships between these.

In the study, the overall scores for social networking addiction were normally distributed indicating that the data were widely dispersed, with slightly more respondents falling into the lower levels of social networking addiction than the higher ranges. The results also demonstrated a low prevalence rate of social networking addiction. Thirty (4.9%) individuals had high levels of social networking addiction, compared to the remaining 581 (94.9%) individuals from the sample. As such, the study sample revealed a notably low addictive pattern, indicating that approximately 5% of the sample surpassed the scale's addiction threshold. In comparison, a meta-analytic review found that collectivist countries had greater estimates of prevalence of social media addiction than individualistic ones and that Africa, in particular, had higher prevalence estimates compared with the Middle East and North America (Cheng et al., 2021). Contrary to the outcomes of the above research, the current study did not support the findings regarding the higher prevalence rates of social networking addiction in Africa. However, it is important to note that the Social Networking Addiction Scale (SNAS) was not included in the abovementioned comparative meta-analysis.

At the time of writing this report, it appeared that only one other study (with high prevalence rates at 45.8 %) had made use of the SNAS (Atwan et al., 2022). This is understandable given that the scale was newly developed and published in 2020.

Earlier research has suggested that today's generation may be more susceptible to experiencing depressive symptoms as a result of the number of hours spent on social networks. For instance, Bányai et al. (2017) reported that compared with the no-risk and low-risk groups for developing social networking addiction, the high-risk group (4.5%) spent more time on social media sites ($M$ = 33.73/week) and experienced more depressive symptoms. These findings are comparable to this study's findings, both for levels of social networking addiction (at 4.9%) and for the amount of time spent on social networks (which was approximately 2-3 hours per day). Another interesting finding was that the majority of participants in the sample were active users on many social media apps, with more than 64% of participants using between four and seven social media apps. The high rates of reported social networking usage and time spent on these platforms in the sample do not entirely match with the levels of reported social networking addiction symptoms, and may indicate possible underreporting due to response bias (Foxcroft & Roodt, 2018; Price et al., 2017).

Bányai et al. (2017) reported that withdrawal received the highest score among the at-risk group in their study, which contrasts with the current study's findings. In the sample, the highest average for reported symptoms was for those associated with salience, followed by mood modification, relapse, withdrawal, tolerance, and, lastly, conflict. The salience, mood modification, and tolerance subscales also had slightly elevated means in relation to their range values while the withdrawal, conflict, and relapse subscales did not. The implications of the average levels of symptoms in the sample might be that social networking is a prominent feature of participants' daily lives and something they engage in frequently. Many of the users in the sample also seemed to continue to use social networks in the same

repetitive, cyclical manner in order to lift their moods, which could be a concern. People who frequently use social networking constantly receive rewards from doing so, and as a result, they tend to become more and more involved, which may lead to a wide range of problems (such as ignoring real-life relationships and conflicts between work and school, for example). The ensuing problems may then make people feel worse about themselves. As a result, these people may engage in social networking activities more frequently as a means of overcoming dysphoric mood states (Griffiths et al., 2014; Xu & Tan, 2012). Since little is known about the forms social networking may take and how it manifests in South Africa, the novel contribution of this set of findings may be an important base for furthering theory and practice.

Aside from social networking addiction findings, the current study found moderate levels of mental health problems in the sample. With the use of the cut-offs from the DASS manual (Lovibond & Lovibond, 2005), almost three-quarters of the sample reported experiencing high levels of depression and/or anxiety. Specifically, 33.5% reported having severe or extremely severe depression, 40% reported having severe or extremely severe anxiety, and 25.5% had severe stress or extremely severe stress. By implication, the present study's findings on mental health are comparable to those of the earlier studies conducted in South Africa. It was previously reported that the estimated risk of mental illness was higher than the lifetime prevalence rate at 47.5% (Herman et al., 2009), and among all mental diseases in South Africa, anxiety had the highest mean number of days spent out of the workplace (Mall et al., 2015). Furthermore, the current findings are also in line with the South Africa Stress and Health (SASH) survey carried out by Stein et al. (2008), including a study done by van Zyl et al. (2017), as determined by the DASS-21 screening test. The results of this study may have reflected the current contextual circumstances surrounding the occurrence of widespread prevalence of mental health issues both domestically and abroad.

As delineated in the literature review, the World Health Organisation (WHO, 2017) reported that depression has become increasingly prevalent around the world, and it is now acknowledged as one of the main contributors to illness and disability. To add to that, *Nature* reported an estimate of 54% of the global population for anxiety and depression combined (Nochaiwong et al., 2021). The sample's rates of depression, anxiety, and stress are thus consistent with prior findings about South Africans' mental health profiles, although they are still concerning and strongly point to the need for more research to determine the underlying causes and contributing factors to poor mental health as a basis for treatment and intervention.

This study also attempted to provide evidence to support established links between social networking addiction and mental health internationally in a population of South African young adults. Correlational and regression analyses were conducted in order to address the study's second research question regarding the nature of the relationships between social networking addiction and mental health. According to the literature, social media addiction has drawn a lot of attention from researchers interested in its effects on mental health. As such, the vast majority of studies have discovered a positive relationship between social networking addiction and poor mental health outcomes (Donnelly & Kuss, 2016; Griffiths et al., 2014; Hussain & Griffiths, 2019). Specifically, depression, anxiety, and stress are considered to be important mental health indicators that may be negatively affected by using social networking sites (Jovanović et al., 2021; Seabrook et al., 2016).

In this study, analyses revealed a number of significant relationships between social networking addiction and mental health dimensions. A significant, positive linear relationship between social networking addiction and overall mental health was identified in the current study. This correlation showed that people who reported higher levels of social networking addiction symptoms also reported higher levels of poor mental health. All three dimensions

of mental health measured in the study, namely: depression, anxiety, and stress, were also found to have significant, positive, and moderate relationships with social networking addiction. The overall level of social networking addiction symptoms reported was also a significant predictor of depression, anxiety, and stress in all of the regression models run in the study except for a single model (for social networking addiction as a predictor of anxiety with dating as a proposed moderator).

These results thus confirm earlier international research that suggests that there is a positive association between social media addiction and depression (Bányai et al., 2017; Nguyen et al., 2020), anxiety (Hussain & Griffiths, 2019), and stress (Hou et al., 2017; Hussain & Griffiths, 2019) and that social networking addiction is a significant predictor of mental health. The study's findings also confirm the theoretical postulations made by the three models of social networking addiction, which posit that behavioural addictions have adverse effects on the user's well-being and their environments (Turel & Serenko, 2012). Conditions such as cognitive distortions, deficiencies in social skills, or lapses in self-regulation may result in behavioural addictions that consequently lead to poor mental health outcomes (Davis, 2001; Caplan, 2005; Zimmerman, 2000).

In this study, depression, anxiety, and stress were also significantly and positively correlated with all six components of social networking addiction—salience, tolerance, mood modification, withdrawal, conflict, and relapse. The strongest relationships identified were those between depression, anxiety, stress, and the relapse component of the components model. This suggests that individuals who found it difficult to reduce social media use and who resorted to going back to previous patterns of behaviours were more likely to have poorer mental health (Griffiths, 2005). The components of salience, tolerance, mood modification, and withdrawal demonstrated slightly weaker positive relationships with the different mental health indicators in the sample, although these were still significant. Similar

to substance-related addictions, behavioural addiction (social networking addiction) incorporates the experience of typical addiction symptoms (Griffiths et al., 2014), suggesting that relapse occurs after a time of abstinence, as addicts soon return to their excessive use of social networks.

According to literature, there is a delicate balance differentiating frequent, non-problematic habitual use of social networks from problematic and potentially addictive use (salience, mood modification, tolerance, conflict, withdrawal, and relapse) (Griffiths & Kuss, 2017). Griffiths and Kuss (2017) argue that users who experience these symptoms and consequences may be classified as "at risk" of social networking addiction or as addicted to using media platforms. The current study's findings, therefore, were consistent with earlier research demonstrating positive associations between social networking addiction and mental health, including levels of depression, anxiety and stress.

### 5.3 Personality, social networking addiction, and mental health

Correlational analyses were conducted to answer the study's third research question regarding the nature of the relationships between personality, social networking addiction, and mental health. Firstly, all five personality dimensions demonstrated normal distributions in the study sample, which is consistent with O'Connor's (2017) evaluation of the Big Five personality traits. Secondly, the findings revealed that neuroticism was significantly and positively associated with overall social networking addiction, while extraversion, agreeableness, conscientiousness, and openness to experience were significantly and negatively related to overall social networking addiction. The correlations also demonstrated that neuroticism was significantly and positively related to all of the social networking addiction dimensions (salience, mood modification, tolerance, conflict, withdrawal, and relapse), while conscientiousness was significantly and negatively related to all of the social

networking addiction dimensions. Extraversion was significantly and negatively related to the tolerance, relapse, and conflict subscales; and agreeableness was significantly and negatively related to the tolerance, withdrawal, relapse, and conflict subscales. Openness to experience was only significantly and negatively related to the tolerance subscale.

Several researchers have looked into personality traits and their relationships to both internet and social media addiction (Huang, 2022; Kircaburun & Griffiths, 2018; Rajesh & Rangaiah, 2020; Sumaryanti et al., 2020). Kayiş et al. (2016) found that internet addiction was positively linked to neuroticism and negatively linked to extraversion, conscientiousness, agreeableness, and openness to experience. This pattern has been supported by other researchers (Andreassen et al., 2013; Blackwell et al., 2017; MacLaren et al., 2011) and is consistent with the findings in the study.

In contrast, previous literature has noted that evidence on the relationships between personality and social media addiction has produced mixed findings (Andreassen et al., 2013; Kircaburun & Griffiths, 2018; Rajesh & Rangaiah, 2020). For instance, extraversion has been found to be either positively related to addiction to social media (c.f. Andreassen et al., 2012; Kuss & Griffiths, 2011; Sindermann et al., 2020; Wang et al., 2015) or negatively related to social media addiction (Kircaburun et al., 2020; Müller et al., 2016). In this study, there was a negative relationship between extraversion and social networking addiction, indicating that as extraversion levels increased, social networking addiction levels decreased. Consistent with the cognitive-behavioural model, it is understood that maladaptive cognitions combined with certain environmental factors ultimately lead to internet and social networking addiction (Davis, 2001; Griffiths et al., 2014). Due to their chatty, outgoing nature, extroverts typically have larger online social networks, participate more in social groups, and spend longer periods of time on social networks (Leong et al., 2019). However, it appears that extraverts may have characteristics that render them less vulnerable to environmental factors and

maladaptive cognitions that typically result in social networking addiction. Furthermore, Ahmed and Vaghefi (2021) indicated that individuals who used social networks to gain others' approval were more likely to develop an addiction to networking sites due to poor self-esteem. On the positive side, increases in extraversion are associated with increases in self-esteem and extraversion and self-esteem have been linked with positive affect and social support (Wilt & Revelle, 2016).

Earlier research has shown that openness to experience was positively associated with frequent use of social networks (c.f. Correa et al., 2010), however, El-Tah and Aradat (2018) found that openness to experience was not associated with the use of social networks. These contrasted with the results of the current study, which showed that openness to experience was significantly and negatively associated with both overall social networking addiction and tolerance (spending increasing amounts of time on platforms) in the sample. One explanation for this could be that social media sites and smartphones are no longer a novelty for open-minded individuals (Prensky, 2001). Furthermore, open-minded people may be better able to control their own and other people's emotions since they are more conscious of their own emotional states (Sutin, 2015). This ability to self-regulate to ward off addictive behaviours can be explained by the socio-cognitive model which is concerned with how a person's lack of self-regulation may lead to social networking addiction (Ahmed & Vaghefi, 2021). Due to their non-conformist, adventurous, and creative traits, open-minded people—who tend to be able to self-regulate—are likely to have a decreased desire to draw social comparisons, the need to belong, and the need for self-representation (Ozimek & Förster, 2021).

Findings from the literature have suggested fairly consistently that neuroticism should be regarded as a risk factor for social networking addiction whereas conscientiousness and agreeableness appear to be protective factors (Ahmed et al., 2022; Huang, 2022; Kircaburun and Griffiths, 2018; Sindermann et al., 2020). The results of this study also support these

conclusions. High neuroticism has been observed to be a predictor of social network use and addiction in several studies (Andreassen et al., 2013; Blackwell et al., 2017; Tang et al., 2018). It has been suggested that social networks can be used to regularly stay in touch with others which may drive those with high neuroticism to be highly anxious during interpersonal interactions. As a result, people identifying with neuroticism seem to be prone to social networking addiction if they use social networks excessively (Blackwell et al., 2017). These findings are in line with López Rosales et al. (2021) who found only neuroticism associated with Facebook addiction. Individuals with high neuroticism may prefer to interact through a screen rather than to communicate face-to-face in the hopes of receiving feedback and comfort from others (Kandell, 1998). This can be explained by the increased demand for self-expression and/or self-representation as a means of obtaining social support (Shen et al., 2015), which is consistent with the social skills model (Caplan, 2005). Furthermore, those with high neuroticism have a propensity towards nervousness, emotional instability, and pessimism (Tackett & Lahey, 2016), and according to the cognitive-behavioural model, are also more likely to exhibit maladaptive cognitions and to feel a strong need for approval from others resulting in social networking addiction (Griffiths et al., 2014). Conscientiousness and agreeableness, on the other hand, which were negatively related to social networking addiction in this study, can be explained by the cognitive-behavioural model (Ahmed & Vaghefi, 2021) in that highly conscientious people who tend to be cautious and diligent and have other interests besides engaging in online interactions may have a reduced susceptibility to social networking addiction. Equally, highly agreeable people who are empathic, considerate, and have the desire to help others may have better real-life relationships thus reducing the risk factors and maladaptive cognitions associated with social networking addiction (Griffiths et al., 2014).

The results in this study therefore largely align with the general findings in the literature and suggest that social networking addiction symptoms were more prevalent in participants who were less extroverted, agreeable, conscientious, and open to experience, as well as those who were more neurotic. Huang et al. (2022) caution that there is large variation in the nature of the relationships identified between social media addiction and personality traits and this does seem to be country specific. The findings from this study are, therefore, an important base from which to establish comparability between South Africa and other countries in terms of the links between personality and social networking addiction, and, if these are confirmed through additional research, could support the application of personality-based interventions for social networking addiction developed internationally in the South African context.

The relationships amongst the Big Five personality traits and depression, anxiety, and stress in the sample were determined using correlation and regression. The results indicated that extraversion, agreeableness, and conscientiousness were all significantly and negatively related to depression, anxiety, and stress, while neuroticism was significantly and positively related to depression, anxiety, and stress. All four of these traits were also significantly predictive of depression, anxiety, and stress in the sample. Openness to experience was not significantly related to depression, anxiety, or stress and was not a significant predictor in the regression models.

These findings are similar to those of Malouff and colleagues (2005), who noted that lower extraversion, agreeableness, conscientiousness, and higher neuroticism were related to mental health problems. Lewis and Cardwell (2020) found that high neuroticism and low conscientiousness was associated with poorer mental health; and Nikčević et al. (2021) found that extraversion, openness to experience, conscientiousness, and agreeableness were negatively correlated with anxiety and depression and neuroticism was positively correlated

with depression and anxiety. This pattern of relationships was expected since positive affectivity and good mental health are typically linked with increased extraversion, agreeableness, and conscientiousness (Costa & McCrae, 2015; Lamers et al., 2012). Research data also supports the hypothesis that high neuroticism levels may play a role in physical health, psychopathology, and quality of life (McCrae, 2006). Those with high levels of neuroticism tend to worry excessively and are more inclined to experience negative emotions, including anxiety, restlessness, and depression (Ahmed et al., 2022; McCrae & John, 1992). This suggests that neuroticism, which is seen as a vulnerability factor, indirectly contributes to poor health outcomes (Tackett & Lahey, 2016). Equally, earlier research has not indicated a positive or negative relationship between openness and depressive states (Kotov et al., 2010; Malouff et al., 2005). The findings imply that less conscientious people who lack self-control (Jackson & Roberts, 2017), introverts who avoid real-life connections (Wilt & Revelle, 2016), and disagreeable people who are unsympathetic and antagonistic (Graziano & Tobin, 2016) are more likely to develop depression, anxiety, and stress. The study's findings thus corroborate earlier studies on the relationships between the personality traits of the Big Five and mental health and suggest that these associations apply equally in the South African context.

The fourth research question asked whether the Big Five personality traits moderated the relationships between social networking addiction and mental health in the sample. The aim was to assess whether there were significant relationships between social networking addiction, depression, anxiety, and stress and whether these relationships appeared to be different based on the level of each of the Big Five traits. In this regard, earlier research has suggested that personality factors played a significant moderating role in the associations between social networking addiction and other factors, such as mental health issues (Andreassen et al., 2013; Blackwell et al., 2017; MacLaren et al., 2011). This suggests that

various personality traits might buffer or intensify the relationships between social networking addiction and negative mental health effects, either reducing or increasing the severity of these (Vujicic & Randjelovic, 2017).

Multiple regression analyses were performed to determine whether the personality traits moderated the relationships between social networking addiction and mental health. In these models, social networking addiction, the personality traits, and the interactions between these were entered as the predictor variables and depression, anxiety, and stress were entered as the output variables. The results showed that only one personality trait—agreeableness—had a significant moderating effect on the social networking addiction-mental health relationship. Both the relationship between social networking addiction and depression and the relationship between social networking addiction and stress were significantly moderated by agreeableness, to the extent that these relationships were weaker for those with higher levels of agreeableness. Agreeableness thus acted as a buffer in these relationships but was not a significant moderator in the relationship between social networking addiction and anxiety.

There does not appear to be any previous research that has explored personality as a moderator of the social networking addiction-mental health relationship in South Africa. Thus, the findings of this study are new and make an important contribution to a better understanding of the role of personality in social networking addiction in the South African context. Agreeableness is typically associated with positive mental health and reduced depression and anxiety (Lamers et al., 2012; Malouff et al., 2005; Nikčević et al., 2021). These findings are similar and comparable to Merrill et al. (2022) who observed that those who were more agreeable were less likely to become depressed than those who were less agreeable. This may be due to the fact that individuals who are more considerate, kind, caring, and empathetic also tend to be more insulated from the negative environmental

influences and distorted cognitive processes associated with both increased social network addiction and poorer mental health as characterised by the cognitive-behavioural model (Griffiths et al., 2014). Therefore, it stands to reason that higher agreeableness levels could serve as a protective factor in the social networking addiction-mental health relationship (Huang, 2022), even though this was only apparent for depression and stress and not anxiety. This could be a result of the specific sample—an artefact of measurement (Cooper et al., 2007) or could reflect a difference in the type of symptoms agreeableness buffers against. To date, there is very little research that has explored personality as a moderator between social networking addiction and mental health. It is also important to emphasise that none of the other personality traits moderated the relationship between social networking addiction and mental health in the sample; this was rather unexpected given that they were directly linked to mental health and, for the most part, served as independent predictors of mental health. More research is needed to explore this further and, in the event that this pattern is confirmed, it may have important implications for the ways in which treatments and interventions for social networking addiction based on personality are developed.

### 5.4 User motives, social networking addiction, and mental health

There has been minimal international research examining the relationships between motives for social network use, social networking addiction, and mental health, and at the time of writing this report, none appeared to be available in South Africa. In addressing the fifth research question, quantitative correlational analyses and regressions were conducted to establish the nature of the relationships between user motives, social networking addiction, and mental health.

Firstly, it was interesting to note the distributions from the current study revealed that the motives of dating, social recognition, and new friendships had the lowest mean scores,

while information, entertainment, and academic purposes had especially high mean scores. This could suggest that participants in the sample were more motivated to use social networking sites for individual purposes such as education and entertainment than for social purposes such as forming social connections. This may also relate to the types of social networking platforms most frequently used in the sample, which were WhatsApp, YouTube, Instagram, and Facebook. For example, WhatsApp was used by almost all of the participants in the sample (97.9%) and it is generally used to maintain existing relationships and for education and information (Kircaburun et al., 2020).

Secondly, correlations were calculated to investigate the relationships between social networking addiction and user motives, and it was observed that all nine motives were significantly and positively associated with higher levels of overall social networking addiction. For the social networking addiction subscales, the motive of new friendships was significantly and positively related to salience, mood modification, withdrawal, and conflict. Furthermore, academic purposes, social connectedness, following and monitoring others, entertainment, and social recognition were significantly and positively related to all six of the subscales, and the self-expression motive was significantly and positively related to salience, mood modification, tolerance, and withdrawal. The dating motive was significantly and positively related to salience, withdrawal, and conflict, and the information motive was significantly and positively related to salience, mood modification, tolerance, withdrawal, and relapse.

Despite the lack of existing literature, some comparisons can nevertheless be made with previous studies. Although not all the Scale of Motives for Using Social Networking sites (SMU-SNS) subscales were used in the study, Karayigit et al. (2021) noted positive associations with social networking addiction and the motives of social connectedness and social recognition. Pertegal et al. (2019) found that loneliness was associated with the motive

of social connectedness—potentially to make up for real-life isolation, while high motive scores on following and monitoring others and self-expression were suggestive of a person's need for social support. People who actively maintained their groups or circle of friends on social networking platforms in order to stay updated boosted their life satisfaction. Kircaburun et al. (2020) found increased levels of problematic use of social networks that were related to certain motives, such as socialising and making new friends, self-expression, and entertainment. Additionally, it was observed that motives predicted people's preferences for different platforms. In the current study, all of the motives were associated with a higher level of overall social networking addiction and most of the motives were related to all or most of the different components of social networking addiction. Consequently, the findings in the current study may suggest that regardless of the reason for using social networking sites, the mere use of these is associated with a higher likelihood of becoming addicted, which does seem to align with previous literature (Pertegal et al., 2019; Wang et al., 2016).

Thirdly, correlations between mental health and user motives were investigated using correlation and regression. It was observed that new friendships, following and monitoring others, social connectedness, entertainment, dating, and social recognition were all significantly and positively correlated with depression, anxiety, and stress. In the regression models, new friendships significantly predicted depression and anxiety, social connectedness significantly predicted stress, following and monitoring others significantly predicted anxiety and stress, and dating significantly predicted anxiety. Entertainment and social recognition did not significantly predict depression, anxiety, or stress. Additionally, the motive for academic purposes was significantly and positively correlated with anxiety and stress, and the motives of self-expression and information were significantly and positively correlated with anxiety. None of these three motives significantly predicted depression, anxiety, or stress in the regression models.

These findings suggest that certain types of social networking motives may be associated more closely with poorer mental health than others. Motives that directly involve social activity and that are more interpersonal in nature such as making new friends or finding a dating partner, following and monitoring the activity of others, making social connections, and gaining social recognition often include activities that elicit direct comparisons with others in the same social network (Hoffman & Novak, 2012). Comparisons that are unfavourable have been found to have negative emotional consequences such as envy, reduced life satisfaction, and lower self-esteem, which may be linked to the idealised way in which many users present themselves and their life experiences online (Braghieri et al., 2022; Cain, 2018; Fardouly et al., 2015; Scully et al., 2020). Many online sites are also designed to reward receiving attention through the number of likes or responses a person receives; and an absence of these while carrying out online activities with a purpose of connecting with others may evoke feelings of shame, distress, and rejection (Cain, 2018). These emotional consequences may, in turn, lead to higher rates of depression, anxiety, or stress, especially if a user feels a strong need for validation through using their social networks (Braghieri et al., 2022; Cain, 2018). In contrast, using social networking sites to gain information, to express oneself, or to carry out academic activities are more individually-based activities that may not involve the same degree of social comparison and perceived judgement and this may explain why these purposes were only related to anxiety and stress in the sample (Hoffman & Novak, 2012).

There appears to be limited research on the associations between different motives for using social networks and the implications they have on mental health. Rae and Lonborg (2015) found that engaging with existing friends on Facebook increased psychological well-being and life satisfaction, whereas connecting to Facebook to search for new friends and connecting for other reasons, increased depression and anxiety levels. Pertegal et al. (2019)

reported that the motive for social connection was linked to loneliness; the motives on self-expression and following and monitoring others were indicative of an individual's need for social support, and the motive for information increased life satisfaction. The motive for entertainment (avoiding boredom and passing time) was found to be positively related to insomnia and poor sleep quality (Brailovska et al., 2019).

There is also research that has established a connection between certain types of user motives and problematic or excessive social media use/social media addiction, which in turn has been shown to relate directly to poorer mental health (Giannakos et al., 2013; Kircaburun et al., 2020; Pertegal et al., 2019; Teppers et al., 2014). For instance, Kircaburun et al. (2020) found that motives such as entertainment, socialising and meeting new people, and putting forward a more popular self were all associated with increased levels of problematic social media usage. Other studies found that the escapism motive (for reducing negative moods) (Brailovskaia et al., 2020), and the self-presentation motive (passing the time and presenting a more popular self) (Süral et al., 2019) were linked to higher addictive use of social media.

The results of this study are particularly useful as a starting point in order to establish a better understanding of the relationships between user motives, social networking addiction, and mental health, however, further research is required as there appears to be very little earlier research available.

The sixth research question pertained to whether different user motives moderated the relationships between social networking addiction and mental health. The aim was to assess whether there were significant relationships between social networking addiction, depression, anxiety, and stress, and whether these relationships appeared to be different based on high or low types of motivation for using social networking sites. Multiple regression analyses were performed with social networking addiction and each user motive (new friendships, for academic purposes, social connectedness, following and monitoring others, self-expression,

dating, entertainment, information, and social recognition) entered as independent variables, and depression, anxiety, and stress entered as outcome variables. Based on the output generated, none of the user motives assessed in the study acted as moderators of the relationships between social networking addiction and depression, stress, and anxiety in the sample.

To date there does not appear to be any existing research that has explored user motives as a moderator in the social networking addiction-mental health relationship in South Africa or internationally, and research regarding the associations between user motives and mental health is also extremely limited. This study sought to add to existing understandings of the complex relationships between user motives, social networking addiction, and mental health and the findings that none of the user motives acted as moderators for the social networking addiction-mental health relationship are thus valuable and contribute to knowledge. Although only from a single study, the findings suggest that the role user motives may play in predicting mental health is separate from the role played by social networking addiction, and this has important implications for treatment and intervention design. However, more research is required to explore this further and to corroborate the findings.

## 5.5 Participants' perceptions of using social networking sites

Responses to open-ended questions were gathered with the quantitative data to better understand what the participants experienced when using social networks and how they experienced this. Some of this data was used to address the seventh research question regarding participants' perceptions of using social networks and how this related to their mental health. Conventional content analysis was used to analyse qualitative data relating to three of the questions asked thematically (Hsieh & Shannon, 2005). The three questions that were selected as most relevant for answering the research questions were how using social

networking sites made participants feel, whether using social networking sites ever made participants feel unhappy or anxious, and whether participants ever felt that they were too involved with social networking sites.

Information was provided about how the use of social networking sites made the participants feel. From the themes that emerged in this study, it is evident that a majority of the participants who made use of social networking sites responded that this made them feel happy, entertained, and relaxed. The findings also identified that while many participants felt positively regarding the use of social networking sites, a number of participants expressed mixed emotions and indicated that this depended on the content of the sites, their interactions with others on the sites, or their mood at the time. There were also a number of respondents who felt fairly neutral and that using social media was part of a daily routine with no emotions attached to this. On the other hand, a few other participants expressed a need for social connection—a sense of belongingness to communities, and others felt the need to keep informed of the latest developments. Further analysis identified that a small proportion of participants felt that their social networking engagement had influenced their life satisfaction and well-being negatively. Some admitted to being conscious of their misuse of social networking sites and believed that they used these to procrastinate or felt distracted or 'hooked' by the sites' addictive nature.

These findings support recent research by De Doncker and McLean (2022) which suggests that the use of social networks has been increasingly integrated into daily life in South Africa. The findings may also be indicative of the low prevalence rate of reported social networking addiction symptoms (4.9%) in the sample since a relatively small proportion of respondents experienced negative emotions or reported significant negative health and psychosocial effects while engaging on social networking sites (Griffiths et al., 2016). This shows replicability with some international research regarding the prevalence of

social networking addiction symptoms (Bányai et al., 2017). The motives participants most often identified for using social networks included entertainment (seeking amusing and relaxing content), information (the need to keep informed of the latest developments), and social connectedness (the need for belongingness to one's community). Using social networks for entertainment (to pass the time) has been related to higher rates of social networking addiction, but other motives that have been related to higher rates of social networking addiction such as seeking new friends, escaping from negative emotions, and presenting oneself as more popular than reality were reported less in the sample (Brailovskaia et al., 2020; Kircaburun et al., 2020; Rae & Lonborg, 2015; Süral et al., 2019). Very few participants mentioned engaging with social networks to obtain approval from others or to escape the real world, which are also motivations that have been found to increase rates of social networking addiction (Ahmed & Vaghefi, 2021).

The participants were also asked whether the use of social networking sites induced feelings of unhappiness or anxiousness. From the themes that emerged from this question, it is apparent that participants were concerned about experiences of social pressure, procrastination and wasted time, constant exposure to negative content, and the addictive nature of social media use. From the information provided, a number of participants felt that the temptation to procrastinate and waste time on social networks affected their daily lives negatively in terms of academic or work productivity. Existing literature has observed that habitual over-engagement and problematic use of social networking sites may lower productivity in terms of occupation, education, and during daily life activities which may potentially lead to addictive behaviour (Bányai et al., 2017; Casale, 2020; Griffiths & Kuss, 2017). Moreover, findings revealed that some participants were exposed to peer pressure and that this resulted mostly from social comparison. A recent study found that using social

networking platforms as a tool for making instant social comparisons on one's social outcomes, for example, status, wealth, and lifestyle, may be what drives social networking addiction (Kim et al., 2021). Additionally, exposure to negative content viewing was another theme that emerged from the information provided. Previous research that corroborates the current study's findings has indicated that traumatic and fear-inducing content on social networking sites may potentially lead to psychological distress—the Covid-19 response, as an example (Zhang et al., 2021).

Further findings revealed that a few participants were aware of the potentially addictive qualities of frequent use of social networks and the adverse impacts that could result from this. Self-awareness of negative emotions evoked may act as a protective factor against developing a full-blown addiction (Goldstein et al., 2008). This awareness may be linked to the ability to recognise when behaviour shifts from mild non-addictive behaviour to the more extreme obsessive behaviour that characterises social networking addiction. Similar to other behavioural addiction studies such as pathological gambling, one of the main characteristics of addiction is the affected person's lack of awareness that they have a problem and their inadequate understanding that the course of action they are pursuing in life is detrimental and no longer beneficial (Brevers et al., 2013). All of the above-mentioned negative reactions are quite comparable to those recognised internationally and fit with the literature addressing negative emotional reactions and cognitive distortions that have been shown to increase the likelihood of social networking addiction and reduced mental health.

The participants were also asked whether they ever felt that they were too involved with social networking sites. The themes that emerged from the responses to this question were: excessive time spent, overdependence/binge-watching, emotionally invested in cause/debates/comments, and affecting aspects of health. From the information that was

provided, it was evident that participants who felt overinvolved on social networking sites experienced some physical and emotional distress as a result of this.

Some participants reported spending countless hours aimlessly scrolling and procrastinating, while falling behind with work or studies. Some made an effort to limit their social media use, while others felt overly involved as a result of their inability to regulate their use. Some key characteristics of social networking addiction include negative and active interference with completing daily life and activities and an intense preoccupation with using the sites. Those who struggled to regulate their use would therefore be at much greater risk of developing a social networking addiction (Khan et al., 2021). Some participants reported experiencing an intense preoccupation with social networking sites, failing to regulate their use of these, and sometimes experiencing unpleasant feelings when they were not able to engage fully on these sites. These symptoms associated with intense preoccupation and unpleasant feelings when faced with the inability to interact online are tapped by the subscales salience and withdrawal symptoms of the Social Networking Addiction Scale (SNAS). In light of this, it is likely that participants exhibited addictive behaviour that is characterised by high salience and an inability to withdraw.

A few participants acknowledged having a variety of physical or mental health problems such as sore eyes, stress, self-neglect, and despondency (hopelessness, and despair) as a result of over-involvement in social networking sites. These findings are in alignment with the known physical and mental consequences of social networking addiction, and especially the potential for excessive use to have a negative effect on mental health (Hussain & Griffiths, 2019; Keles et al., 2020; Li et al., 2022; Seabrook et al., 2016). Equally, the findings in this current study, specifically the finding that increased experiences of social networking addiction symptoms was both related to and predictive of poorer mental health such as depression, stress, and anxiety, are also in line with this.

Some participants reported that over-involving themselves by following others on social media platforms caused them to become emotionally entangled in a variety of situations. In some instances, they felt emotionally invested in various causes, debates, and other people's comments; and a few indicated that they regretted oversharing personal information online. Pertegal et al. (2019) observed high motive scores on self-expression and following and monitoring others were indicative of an individual's need for social support. A strong need for social support has been attributed to lower levels of self-esteem and increased loneliness, both of which have been linked to a greater risk for social networking addiction (Ahmed & Vaghefi, 2021; Dalvi-Esfahani et al., 2019). This generally supports the relevance of motives as a potential factor in determining social networking addiction.

Self-regulation and social comparison emerged as two broader themes from the qualitative data overall. In particular, participants seemed most concerned about their use of social networking and the potential consequences this could have if they felt they were less able to regulate or control their involvement. Participants also seemed to report that the most negative consequences of using social networking sites that they experienced were a result of comparing themselves to others online or feeling rejected in some way. These findings strongly align with the literature on social networking addiction and the detrimental effects of excessive social networking use on mental health (Appel et al., 2016; Fardouly et al., 2015). The information provided in the qualitative data, therefore, supported some of the trends identified regarding motives in the study and literature. In particular, more social motives tended to be reported as evoking more negative emotions, and certain motives also seemed to be linked more closely with a risk of social networking addiction.

The information provided in this analysis supports existing literature pertaining to the harmful effects of social networking addiction and mental health (Cheng et al., 2021; Dalvi-Esfahani et al., 2019; Griffiths & Kuss, 2017; Jovanović et al., 2021; Nguyen et al., 2020).

This study attempted to provide a rich, comprehensive response to the study's research questions by integrating quantitative and qualitative data to assist in identifying similarities and differences between the two. Consequently, this procedure assisted in demonstrating how the qualitative information supported several of the quantitative findings.

## 5.6 Conclusions and implications

This study appears to be the first in South Africa to investigate the relationships between social networking addiction, personality, user motives, and outcomes related to mental health. A mixed methods approach was used to collect, analyse, and interpret the data taken from a sample consisting of 612 South African young adults. The study aimed to examine the nature of the relationships between social networking addiction and depression, anxiety, and stress as indicators of mental health. It also investigated whether personality and user motives moderated the relationships between social networking addiction and depression, anxiety, and stress. The qualitative data collected in the study provided insight into how participants themselves described their use of social networks, allowing for a deeper understanding of the potential consequences of the country's growing reliance on social media and smartphones. This study, therefore, hoped to build on earlier research done (Chen & Roberts, 2020; Donnelly & Kuss, 2016; Griffiths, 2013; Kircaburun et al., 2020; Kuss & Griffiths, 2011; Shahnawaz & Rehman, 2020; Vujicic & Randjelovic, 2017), as well as to contribute to South African literature on social networking addiction, mental health, personality, and user motives.

All four scales used in this study—the Social Networking Addiction Scale (SNAS), the Depression, Anxiety, and Stress Scale (DASS-21), the Big Five Inventory (BFI), and the Scale of Motives for Using Social Networking Sites (SMU-SNS)—demonstrated sound internal consistency reliability in the sample. The findings demonstrated a low prevalence of

social networking addiction in the sample of approximately 5%, although more than 64% of participants used between four and seven social media apps and spent approximately 2 to 3 hours per day or more on social media platforms. The top three apps used in the sample were WhatsApp, YouTube, and Instagram. Moreover, the results indicated moderate levels of mental health problems in the sample, with 33.5% reporting severe or extremely severe depression, 40% reporting severe or extremely severe anxiety, and a further 25.5% reporting severe stress or extremely severe stress. Furthermore, significant, positive linear relationships between social networking addiction symptoms and mental health were identified, suggesting that participants who used social media platforms excessively also reported higher levels of poor mental health in the form of depression, anxiety, and stress. Multiple regression showed that social networking addiction was also a consistent, significant, and positive predictor of depression, anxiety, and stress in the sample.

With regards to the relationships between social networking addiction and personality, neuroticism was significantly and positively related to social networking addiction and extraversion, agreeableness, conscientiousness, and openness were significantly and negatively related to social networking addiction. For the relationships between mental health and personality, the results indicated that extraversion, agreeableness, and conscientiousness were all significantly and negatively related to depression, anxiety, and stress, while neuroticism was significantly and positively related to depression, anxiety and stress. Openness to experience was not significantly related to any of the three emotional states. Extraversion, agreeableness, conscientiousness, and neuroticism were also all significant predictors of mental health across all of the regression models, with lower levels of extraversion, agreeableness, and conscientiousness, and higher levels of neuroticism predicting higher levels of depression, anxiety, and stress.

Agreeableness was the only personality trait that significantly moderated the relationships between social networking addiction and mental health in the sample. Specifically, agreeableness moderated the relationships between social networking addiction and depression and social networking addiction and stress such that higher levels of agreeableness reduced the strength of the relationship between these and thus acted as a buffer in these relationships. Agreeableness did not moderate the relationships between social networking addiction and anxiety, and none of the other personality traits moderated any of the relationships between social networking addiction and mental health in the sample.

With regards to the relationships between user motives and social networking addiction, all nine motives were positively associated with higher levels of social networking addiction. However, only the motives of new friendships, social connectedness, following and monitoring others, entertainment, dating, and social recognition were significantly and positively correlated with depression, anxiety, and stress in the sample. The motive of academic purposes was significantly and positively related to anxiety and stress, and both information and self-expression were significantly and positively related to anxiety. In the regression models, only a motive for new friendships significantly predicted depression; motives for new friendships, following and monitoring others, and dating predicted anxiety; and motives for social connectedness and following and monitoring others predicted stress. Motives for entertainment, self-expression, social recognition, academic purposes, and information did not significantly predict any of the mental health indicators in the sample. Furthermore, none of the user motives assessed in the study moderated the relationships between social networking addiction and mental health.

Finally, the qualitative information provided by the participants supported the study's quantitative findings and existing literature pertaining to the harmful effects of social networking addiction and mental health. The findings indicated that while a majority of

participants felt positive or neutral about how using social networking sites made them feel, a number of participants expressed mixed or negative emotions about this. When asked directly about negative emotional experiences, participants indicated that they were concerned about experiences of social pressure, the temptation to procrastinate and waste time, constant exposure to negative content, and the addictive nature of social media use. When asked directly about over-involvement with social networking sites, themes that emerged included spending an excessive amount of time on social networks, binge-watching and developing an overdependence on social networks, becoming overly invested emotionally in causes, debates, or online commentary, and negative physical and emotional consequences from overuse. Some participants indicated that over-involvement was a result of their not feeling able to regulate their use of social networks successfully; and some participants mentioned self-neglect, stress, and despondency as negative effects of over-involvement. Comparison with others emerged as a source of distress and negative consequences from using social networking sites.

The main findings from the study have several potential implications for theory and practice. Firstly, despite the growing usage of social media sites in South Africa, the low prevalence rate of social networking addiction was similar to that of international rates, therefore, these findings support existing theory and the relevance of the current research. However, the prevalence of moderate levels of depression, anxiety, and stress found in this study was concerning. This raises the question of the extent to which the findings of this study may have been influenced by the context in which reported increases in mental health problems, such as depression, anxiety, and stress are currently prevalent both locally and internationally. This underscores the critical need for further research to better understand the mechanisms contributing to the current rates of depression, anxiety, and stress.

Furthermore, this study's major finding showed that social networking addiction was related to as well as predictive of mental health (depression, anxiety, and stress); and as such, highlighted the importance of understanding the causes and development of social networking addiction in South Africa. Accordingly, this part of the study may have important practical implications for developing interventions and treatments. Analyses also showed that all personality traits were related to social networking addiction and neuroticism, extraversion, conscientiousness, and agreeableness were predictive of mental health. Another important practical and theoretical implication is that these findings not only suggest that these traits should be factored in for treatment and intervention but also add support for an emerging pattern of connections in the literature. With the exception of agreeableness, none of the other personality traits moderated any of the relationships between social networking addiction and mental health in the sample. It was revealed that only the trait of agreeableness moderated the relationships between social networking addiction and depression and social networking addiction and stress, such that the strength of these relationships was reduced for those with higher levels of agreeableness. This finding highlights a theoretical contribution to existing literature as no earlier research has explored this to date, therefore, further research is necessary to corroborate this and whether it is supported in other contexts.

Additionally, findings from statistical analyses showed that of the five user motives that were not significant predictors, four—academic purposes, information, entertainment, and social recognition—appeared to be more intrinsic and individual in nature, while all the motives that predicted mental health—new friendships, social connectedness, dating, and following and monitoring others—seemed to be socially-based and to be strongly interpersonal in nature. There appears to be limited research available on this distinction across all motives, therefore, this highlights the need for further research to establish whether there are more consistent patterns. Equally, this may suggest that user motives may play a

role in the development of social networking addiction but less of a role in mental health consequences linked to social networking addiction. One interesting finding is that the motives identified as predictors were all predominantly socially-based. As a result, this finding has possible implications for future research. Another interesting finding is that none of the user motives moderated any of the relationships between social networking addiction and mental health in the sample and as such, this may be an important finding to contribute to theory, however, more research is necessary so as to confirm this and whether it is supported in other contexts. Lastly, the qualitative findings suggested that while only a small number of participants experienced purely negative emotions when using social networks, there was a range of explanations provided by participants who felt unhappy or anxious that were often linked to situations involving comparisons with others. Furthermore, overinvolvement was seen as connected to a failure to be able to regulate usage, as well as an excessive emotional investment, with both leading to negative physical and emotional consequences, including stress and despondency. These qualitative findings, therefore, support the quantitative findings in the study and enhance previous understandings of how the process of developing social networking addiction occurs and the implications of using social networks by adding richness and depth to the quantitative findings and providing insight into personal experiences.

## 5.7 Strengths and limitations of the study

The current study presented some limitations that should be acknowledged despite its contribution to existing literature. This study employed a convergent mixed methods approach. For the quantitative section, a non-experimental, correlational and cross-sectional method was used, therefore, it was not possible to establish causal conclusions (Laher, 2016). Nevertheless, as this was not the aim of the study, its practical, flexible and useful methods

were sufficient for establishing relationships and seeing real-life patterns (Terre Blanche et al., 2006). For the qualitative component, the phenomenological approach was beneficial for gaining insight, since its inclusion enriched understandings (Teherani et al., 2015). However, due to the nature of the questionnaire and missing responses, there was limited depth to the responses as it was not possible to fully capture the participants' perspectives or explore these in more detail. A mixed methods approach is useful for balancing the different strengths of the two approaches and allowing one to inform the other, however, more time and resources were required to collect and analyse the data and integrate the findings.

Despite being relatively large (n = 612) and representing a range of characteristics, the sample in the current study nonetheless was still relatively small, limiting how well it could accurately reflect the broader population. The use of non-probabilistic sampling methods, such as convenient and snowball sampling, also raises concerns regarding generalisability in terms of adequately representing young adults in South Africa (Salkind, 2012). An online survey was used which required English-speaking volunteers with access to the Internet and data, and the majority of those who responded were university students representing a high level of education. As a result, the findings may have been impacted by a combination of sample non-representativeness, self-reported questionnaires, and response bias (i.e., social desirability) (Foxcroft & Roodt, 2018). Nevertheless, the sampling method used in this study was necessary for practical reasons and sufficient for research purposes (Durrheim & Painter, 2006).

Although good reliability was determined from the sample for all the scales used in this study, validation procedures were not considered (Foxcroft & Roodt, 2018). Furthermore, the psychometric properties of the Social Networking Addiction Scale (SNAS) and the Scale of Motives for Using Social Networking Sites (SMU-SNS) have not been fully established as these scales appear to have never been used in a South African sample previously. All

instruments were self-report in nature and, therefore, relied on the ability of the respondents to understand the questions and their willingness to respond honestly and accurately (Foxcroft & Roodt, 2018). In certain cases, missing data was encountered although this was accounted for in the analysis wherever possible. The online administration of the measures, although practical, may have limited the responses from those with connectivity and data issues.

All ethical requirements were adhered to, and precautionary measures were carried out to ensure participants were not disadvantaged in any way. Participants were also provided with a referral for assistance if necessary. Although precautionary measures were carried out to ensure that all assumptions were met for the statistical analyses in the study, some minor concerns regarding multicollinearity were identified in a few of the regression models. In conjunction with conventional content analysis, some necessary steps were taken to ensure qualitative rigour, such as trustworthiness and reflexivity. Direct quotes were selected to reflect the participants' voices in articulating the major themes, however, there were missing responses for these questions which may have affected the range of issues discussed and the themes that emerged.

Despite the limitations of this study, one of its key strengths is that it contributed to limited South African research on the relationships between social networking addiction, mental health, personality, and user motives. Furthermore, it is hoped that the results of the Big Five Inventory (BFI) contribute to existing research in the local context in terms of the Five Factor Model, although construct validity was not determined in this study. Another important strength was that the qualitative component enriched the study further by allowing for a better understanding of the participants' perspectives on the use of social media. A number of novel findings emerged from the study, and although further research is needed to

verify these, they nevertheless represent an important contribution to existing knowledge and may contribute to intervention and treatment practice.

## 5.8 Future directions for research

Future research conducted in South Africa should seek to expand on the findings in this study and to explore the key constructs in the study and the relationships between these further and in more detail. More research is necessary to explore the extent to which social networking addiction is prevalent in the South African context, the symptom profile for social networking addiction in young South Africans, and how social networking addiction is related to mental health. More research is also needed to explore how social networking addiction may be linked to the types of motives for using social networking sites and the types of apps used; and whether more socially-based motives for using social networking sites are more closely related to the development of social networking addiction. There is also an urgent need for more research on levels of mental health in young South Africans and factors that might contribute to this.

Equally, larger sample sizes spread over a wider geographical area and more representative samples should be used in future research in order to properly extend and generalize future findings. It would also be important to research the effects of using different types of social networking sites and the role that time spent on these plays. In order to mitigate possible response bias in future research, “screen time” information should be included in the questionnaire for each social networking app used (Linder, 2022). Furthermore, the psychometric properties of the scales used in this study should be fully established in South African samples and alternate instruments for measuring the same constructs should also be explored. More detailed and comprehensive qualitative information from a range of different participants should also be obtained in order to more fully

understand people's perceptions and experiences in the context of social networking use and the implications thereof.

Given that the practical concerns of excessive social media use in this country have not been addressed sufficiently, awareness programmes should be developed and initiated in schools and the workplace regarding the risks of excessive use and the addictive nature of social networking sites which may potentially result in negative health consequences. This could aid in increasing awareness and setting the groundwork for intervention and treatment. Future research could also focus on evaluating these and on establishing how to make these programmes more effective.

Social networking has become the norm in society. Most institutions today strongly advocate the use of social networking for personal, professional, and educational purposes, therefore, this study attempted to provide information on the prevalence of social networking addiction and its potential links to negative mental health in South Africa. It would be important for future studies to build on the findings in this study and to extend these using different samples, methods, and analyses to better understand social networking addiction in South Africa.

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# 7 APPENDICES

## 7.1 Appendix A: Demographic Information

Please provide the following biographical information. Note that this information cannot be used to identify you as a particular individual and will be kept entirely confidential.

| | | |
|---|---|---|
| 1 | Age in years (please type in your answer) | |
| 2 | Gender | Male<br>Female<br>Trans-gender<br>Non-binary<br>Prefer not to answer<br>Other (please specify)<br>--------- |
| 3 | Race | Asian<br>Black<br>Coloured<br>Indian<br>White<br>Other (please specify)<br>--------- |
| 4 | Languages spoken<br>(please select as many as apply) | Afrikaans<br>English<br>Ndebele<br>Northern Sotho<br>Southern Sotho<br>Swati<br>Tsonga<br>Tswana<br>Venda<br>Xhosa<br>Zulu<br>Other:<br>(please specify) |
| 5 | Please indicate the language you speak most often (please type in only one language) | |
| 6 | Highest qualification completed/ completing (if you are currently completing a qualification please select the qualification you are currently completing) | Doctorate<br>Masters<br>Honours<br>Bachelors/ undergraduate degree<br>Diploma<br>Technical/Vocational<br>National Senior Certificate/ Matric<br>Some High School<br>Other:<br>(please specify) |
| 7 | Employment status<br>(please select as many as apply) | Employed full-time<br>Employed part-time<br>Self-employed<br>Not employed<br>Studying full-time<br>Studying part-time<br>Other:<br>(please specify) |

| | | |
|---|---|---|
| 8 | If you are currently employed (full-time, part-time, or self-employed), please type in your occupation and field of work | |
| 9 | If you are currently studying (full-time or part-time), please type in your field of study and your current year of study | |
| 10 | Which of the following social media platforms do you currently use?<br>(please select as many as apply) | I do not have any social media accounts (please give a reason for this answer)<br>I deleted/deactivated all my social media accounts (please give a reason for this answer)<br>Instagram<br>Facebook<br>TikTok<br>Twitter<br>WhatsApp<br>Telegram<br>Signal<br>LinkedIn<br>Snapchat<br>Tumblr<br>Pinterest<br>Reddit<br>YouTube<br>Other: _____<br>(please specify) |
| 11 | Average time spent on social media per day | Not applicable<br>0-15 minutes<br>15 minutes-30 minutes<br>30 minutes to 1 hour<br>1-2 hours<br>2-3 hours<br>3-4 hours<br>4-5 hours<br>5-8 hours<br>8-10 hours<br>More than 10 hours |

## 7.2 Appendix B: Social Networking Addiction Scale (SNAS)

**For each of the questions below, select the response that best characterises how you feel about the statement, where**
**1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always**

| | | Never (1) | Rarely (2) | Sometimes (3) | Often (4) | Always (5) |
|---|---|---|---|---|---|---|
| 1 | While I work/study, my mind remains on social networking sites. | | | | | |
| 2 | I go to social networking sites instantly after waking up in the morning. | | | | | |
| 3 | I check for updates on social networking sites while studying/ working. | | | | | |
| 4 | I check my social networking account before starting any task or activity. | | | | | |
| 5 | I go to social networking sites whenever I am upset. | | | | | |
| 6 | Social networking helps me lift my mood. | | | | | |
| 7 | I feel relaxed whenever I am on social networking sites. | | | | | |
| 8 | These days I spend more and more time on social networking sites. | | | | | |
| 9 | When compared I spend more time on social networking sites now than I did in the past. | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| 10 | I need to be on social networking sites for longer time than before to be satisfied. | | | | | |
| 11 | I feel sad when I am unable to log in to social networking sites. | | | | | |
| 12 | I become irritable whenever I cannot log in to social networking sites. | | | | | |
| 13 | I feel frustrated when I cannot use social networking sites. | | | | | |
| 14 | I become restless when I do not get time for social networking. | | | | | |
| 15 | I try to hide the time I spend on social networking. | | | | | |
| 16 | I need to lie to my family and others when they ask about my social networking usage. | | | | | |
| 17 | I ignore my sleep because I have/ want to be on social networking sites. | | | | | |
| 18 | I have failed to cut down the time I spend on social networking sites. | | | | | |
| 19 | I have tried to stop using social networking sites but have failed. | | | | | |
| 20 | I am unable to cut-down the time I spend on social networking sites. | | | | | |
| 21 | My repeated attempts to reduce the time I spend on social networking sites have failed. | | | | | |

## 7.3 Appendix C: The Depression, Anxiety and Stress Scales (DASS-21)

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past month**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:
0 Did not apply to me at all
1 Applied to me to some degree, or some of the time
2 Applied to me to a considerable degree or a good part of time
3 Applied to me very much or most of the time

| | | | | | |
|---|---|---|---|---|---|
| 1 | I found it hard to wind down. | 0 | 1 | 2 | 3 |
| 2 | I was aware of dryness of my mouth. | 0 | 1 | 2 | 3 |
| 3 | I couldn't seem to experience any positive feeling at all. | 0 | 1 | 2 | 3 |
| 4 | I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion). | 0 | 1 | 2 | 3 |
| 5 | I found it difficult to work up the initiative to do things. | 0 | 1 | 2 | 3 |
| 6 | I tended to over-react to situations | 0 | 1 | 2 | 3 |
| 7 | I experienced trembling (e.g. in the hands). | 0 | 1 | 2 | 3 |
| 8 | I felt that I was using a lot of nervous energy. | 0 | 1 | 2 | 3 |
| 9 | I was worried about situations in which I might panic and make a fool of myself. | 0 | 1 | 2 | 3 |
| 10 | I felt that I had nothing to look forward to. | 0 | 1 | 2 | 3 |
| 11 | I found myself getting agitated. | 0 | 1 | 2 | 3 |
| 12 | I found it difficult to relax. | 0 | 1 | 2 | 3 |
| 13 | I felt down-hearted and blue. | 0 | 1 | 2 | 3 |
| 14 | I was intolerant of anything that kept me from getting on with what I was doing. | 0 | 1 | 2 | 3 |
| 15 | I felt I was close to panic. | 0 | 1 | 2 | 3 |
| 16 | I was unable to become enthusiastic about anything. | 0 | 1 | 2 | 3 |
| 17 | I felt I wasn't worth much as a person. | 0 | 1 | 2 | 3 |
| 18 | I felt that I was rather touchy. | 0 | 1 | 2 | 3 |
| 19 | I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat). | 0 | 1 | 2 | 3 |
| 20 | I felt scared without any good reason. | 0 | 1 | 2 | 3 |
| 21 | I felt that life was meaningless. | 0 | 1 | 2 | 3 |

## 7.4 Appendix D: Big Five Inventory (BFI)

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who likes to spend time with others? Please select a number next to each statement to indicate the extent to which you agree or disagree with that statement.

| | | Disagree strongly | Disagree a little | Neither agree nor disagree | Agree a little | Agree Strongly |
|---|---|---|---|---|---|---|
| | **I see Myself as Someone Who...** | | | | | |
| 1 | Is talkative | 1 | 2 | 3 | 4 | 5 |
| 2 | Tends to find fault with others | 1 | 2 | 3 | 4 | 5 |
| 3 | Does a thorough job | 1 | 2 | 3 | 4 | 5 |
| 4 | Is depressed, blue | 1 | 2 | 3 | 4 | 5 |
| 5 | Is original, comes up with new ideas | 1 | 2 | 3 | 4 | 5 |
| 6 | Is reserved | 1 | 2 | 3 | 4 | 5 |
| 7 | Is helpful and unselfish with others | 1 | 2 | 3 | 4 | 5 |
| 8 | Can be somewhat careless | 1 | 2 | 3 | 4 | 5 |
| 9 | Is relaxed, handles stress well | 1 | 2 | 3 | 4 | 5 |
| 10 | Is curious about many different things | 1 | 2 | 3 | 4 | 5 |
| 11 | Is full of energy | 1 | 2 | 3 | 4 | 5 |
| 12 | Starts quarrels with others | 1 | 2 | 3 | 4 | 5 |
| 13 | Is a reliable worker | 1 | 2 | 3 | 4 | 5 |
| 14 | Can be tense | 1 | 2 | 3 | 4 | 5 |
| 15 | Is ingenious, a deep thinker | 1 | 2 | 3 | 4 | 5 |
| 16 | Generates a lot of enthusiasm | 1 | 2 | 3 | 4 | 5 |
| 17 | Has a forgiving nature | 1 | 2 | 3 | 4 | 5 |
| 18 | Tends to be disorganized | 1 | 2 | 3 | 4 | 5 |
| 19 | Worries a lot | 1 | 2 | 3 | 4 | 5 |
| 20 | Has an active imagination | 1 | 2 | 3 | 4 | 5 |
| 21 | Tends to be quiet | 1 | 2 | 3 | 4 | 5 |
| 22 | Is generally trusting | 1 | 2 | 3 | 4 | 5 |
| 23 | Tends to be lazy | 1 | 2 | 3 | 4 | 5 |
| 24 | Is emotionally stable, not easily upset | 1 | 2 | 3 | 4 | 5 |
| 25 | Is inventive | 1 | 2 | 3 | 4 | 5 |
| 26 | Has an assertive personality | 1 | 2 | 3 | 4 | 5 |
| 27 | Can be cold and aloof | 1 | 2 | 3 | 4 | 5 |
| 28 | Perseveres until the task is finished | 1 | 2 | 3 | 4 | 5 |
| 29 | Can be moody | 1 | 2 | 3 | 4 | 5 |
| 30 | Values artistic, aesthetic experiences | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 31 | Is sometimes shy, inhibited | 1 | 2 | 3 | 4 | 5 |
| 32 | Is considerate and kind to almost everyone | 1 | 2 | 3 | 4 | 5 |
| 33 | Does things efficiently | 1 | 2 | 3 | 4 | 5 |
| 34 | Remains calm in tense situations | 1 | 2 | 3 | 4 | 5 |
| 35 | Prefers work that is routine | 1 | 2 | 3 | 4 | 5 |
| 36 | Is outgoing, sociable | 1 | 2 | 3 | 4 | 5 |
| 37 | Is sometimes rude to others | 1 | 2 | 3 | 4 | 5 |
| 38 | Makes plans and follows through with them | 1 | 2 | 3 | 4 | 5 |
| 39 | Gets nervous easily | 1 | 2 | 3 | 4 | 5 |
| 40 | Likes to reflect, play with ideas | 1 | 2 | 3 | 4 | 5 |
| 41 | Has few artistic interests | 1 | 2 | 3 | 4 | 5 |
| 42 | Likes to cooperate with others | 1 | 2 | 3 | 4 | 5 |
| 43 | Is easily distracted | 1 | 2 | 3 | 4 | 5 |
| 44 | Is sophisticated in art, music, or literature | 1 | 2 | 3 | 4 | 5 |

## 7.5 Appendix E: The Scale of Motives for Using Social Networking Sites (SMU-SNS)

The following statements are about the motives for using social networking sites. Read them and answer indicating to which extent they apply to you.

| 1 2 3 4 5 6 7<br>Completely untrue Completely true | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1. | To hook up | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. | To look for a date | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. | To seek a romantic partner | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. | To make new friends | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. | To extend my circle of friends | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. | To meet new people | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. | To ask for information about what to study for the exams/what to prepare for work | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. | To ask or share class/ work-related information | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. | To check or share group assignments/ to consult about work with colleagues | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. | To not feel disengaged from the world | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. | To feel connected with people | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12. | To feel socially integrated | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13. | To keep up-to-date with what my contacts are doing in their day-to-day life | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14. | To know the details of my friends' lives | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15. | To snoop on people that I am interested in | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16. | To fill my free time | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17. | To kill time when I am bored | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18. | To entertain myself | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19. | To stand out from others | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20. | For other people to comment my posts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. | To check that other like my posts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22. | To express my feelings and thoughts | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23. | To give my opinion on a topic | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24. | To discuss some subject (with other people) | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 25. | To keep up about what happens in the world | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 26. | To be informed about the news | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 27. | To find information about the topics that I like and am interested in | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## 7.6 Appendix F: Open-ended Survey Questions

1. Why do you use social networking sites? Please give a brief explanation for your answer.
2. Is using social networking sites important for you? Please give a brief explanation for your answer.
3. Is there anything that you particularly like about using social networking sites?
4. Is there anything that you particularly dislike about using social networking sites?
5. If you use social networking sites, how does using these make you feel?
6. If you use social networking sites, does using these ever make you feel unhappy or anxious? Please give a brief explanation for your answer.
7. Are there ever times when you feel that you are too involved with social networking sites? Please give a brief explanation for your answer.

## 7.7 Appendix G: Access Request Letter

[formal Departmental letterhead to be inserted]

Date: [to be inserted]

To [relevant title/ name to be inserted]

My name is Irene Sarrimanolis, and I am conducting research at the University of the Witwatersrand in partial fulfilment of the requirements to obtain a Masters by Dissertation degree in Psychology. My research aim is to explore the relationships between social networking addiction, mental health, personality, and motives for social networking use.

I am requesting permission to please be allowed to approach first year through to postgraduate students, including the [year-level/s to be inserted] students registered in your [Institution/ School/ Department/ class], to ask them to participate in my research study. If you are willing to allow this, please can you provide me with a brief formal letter or email giving consent for this. If you are a course coordinator and/or lecturer, I am also requesting that you please send out an invitation to participate in the study with a participant information sheet attached on [Ulwazi or alternate institutional e-learning site] to the class. The study will ask students to volunteer to complete an electronic survey which will take 20 to 30 minutes.

Participation is completely voluntary and will not advantage or disadvantage students in any way whether they choose to complete the survey or not. There are also no direct benefits and minimal foreseeable risks for participating in the study (a referral for counselling will be included in the participant information sheet if respondents are concerned about any of the questions asked or would like to discuss these further). Participants will be given a full participant information sheet with the invitation and will be asked to give consent to participate; submission of a completed questionnaire will be seen as informed consent to participate in the study. No identifying information, such as names or identity numbers, will be asked for and participants will therefore remain completely anonymous and the data they provide will not be linked to them as individuals in any way. Participants will be able to obtain feedback for the study in the form of a summary of general results; individual feedback will not be possible as the data is anonymous. Participants

will also be asked for permission to store their data in anonymous electronic form and to use this for future research. The research and research supervisor's contact details will be provided in the participant information sheet.

This research will help to better understand social networking addiction and mental health. If you choose to allow me to approach students for their participation, it would therefore be greatly appreciated.

If you have any questions or concerns, please feel free to contact me or my supervisor as per the details below. Any queries regarding ethical issues can also be directed to: The University of the Witwatersrand Human Research Ethics Committee (non-medical): 011-717-1408; Shaun.Schoeman@wits.ac.za.

Yours sincerely,

Irene Sarrimanolis

Student: Irene Sarrimanolis; 1260758@students.wits.ac.za

Supervisor: Dr Nicky Israel 011-717-4557; Nicky.Israel@wits.ac.za

## 7.8 Appendix H: Electronic Survey Invitation

Hi,

My name is Irene and I am a Master's student in Psychology at the University of the Witwatersrand. I am doing a study to explore social networking addiction, mental health, personality, and motives for social networking use. In order to get data for the study, I am asking for South African adult volunteers between the ages of 18 and 35 to please fill out an online survey that should take approximately 20 – 30 minutes of your time. This survey will run for 4 to 6 weeks. Please take note of the following:

- Your participation is completely voluntary
- Responses will be completely confidential and anonymous.
- Completion of the survey will be considered as consent to participate.
- Once submitted, it will be used for research purposes

I would really appreciate if you would consider participating in my study!

Please follow the link below which will take you to an online survey with the participant information sheet and questionnaires.

[link address to be inserted]

If you know of anyone else who would fit in the sample and who might be interested in participating in the study, please pass this invitation on to them as well.

Thank you in advance,
Researcher: Irene Sarrimanolis (1260758@students.wits.ac.za)

Supervisor: Dr Nicky Israel (Nicky.Israel@wits.ac.za)

## 7.9 Appendix I: Participant Information Sheet

[formal Departmental letterhead to be inserted]

Date: [to be inserted]

Hello,

My name is Irene Sarrimanolis and I am a student currently completing my Masters by Dissertation in Psychology at the University of the Witwatersrand. As part of the requirements for my degree, I am conducting research. My research aim is to explore the relationships between social networking addiction, mental health, personality, and motives for using social networks. I will be using data obtained from volunteers in the South African population between the ages 18 -35 with access to the Internet in order to answer the research questions.

If you meet these criteria, I would like to ask you to please consider participating in my study. Participating will require you to access and complete a set of online questionnaires at a convenient time for you. These questionnaires should take approximately 20-30 minutes to complete and you are asked to do this within four to six weeks of receiving this invitation. Once you have answered the questionnaires, you can submit the completed answers online.

Participation is completely voluntary and you will not be advantaged or disadvantaged in any way, whether you choose to complete the questionnaires or not. You will be asked for informed consent to participate in the study at the end of this participant information sheet and submission of the completed questionnaire will be regarded as consent to participate in the study. No identifying information, such as your name or identity number, will be asked for and you will therefore be completely anonymous. Your responses will remain confidential and your anonymity is guaranteed as no identifying information or IP addresses will be recorded.

There are no direct benefits for participating in the study. In the event that you are concerned by any of the questions asked in the questionnaires and/or if you would like to discuss any of these further, you can contact: SADAG 8am-8pm Monday to Sunday – 011-234-4837; 24 hour helpline 0800-456-789; Zane Wilson zane@sadag.org. To find out more information on social networking addiction, please access the following website:

https://www.recoverydirect.co.za/10-surefire-signs-that-you-are-addicted-to-social-media/

You will be able to obtain feedback for the study in the form of a summary of the general results by requesting this from the researcher; individual feedback will not be possible as the data is anonymous. With your permission, we would also like to store your responses permanently in anonymous, electronic form to possibly use for future research projects. Findings from this study will be reported in a dissertation submitted to the University of the Witwatersrand and may be reported in academic journals and/or at conferences as well.

This research will help to better understand social networking addiction and mental health. If you have any questions or concerns, please feel free to contact me or my supervisor as per the details below. Ethical queries can also be directed to: The University of the Witwatersrand Human Research Ethics Committee (non-medical): 011-717-1408; Shaun.Schoeman@wits.ac.za.

Yours sincerely
Irene

Irene Sarrimanolis; 1260758@students.wits.ac.za

Supervisor: Dr Nicky Israel (Nicky.Israel@wits.ac.za)

I have read the details of this study and consent to participate in the study on a voluntary basis. I also understand that I may withdraw at any point up to submission.

| YES | NO |
|---|---|

## 7.10 Appendix J: Ethics Clearance Certificate

UNIVERSITY OF THE WITWATERSRAND JOHANNESBURG

Research Office

**HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)**
R14/49 Sarrimanolis

| | |
|---|---|
| **CLEARANCE CERTIFICATE** | **PROTOCOL NUMBER: H21/07/42** |
| **PROJECT TITLE** | Social Networking Addiction, Mental Health, Personality Traits and User Motives |
| **INVESTIGATOR(S)** | Ms I Sarrimanolis |
| **SCHOOL/DEPARTMENT** | Human and Community Development/ |
| **DATE CONSIDERED** | 23 July 2021 |
| **DECISION OF THE COMMITTEE** | Approved<br>Risk Level: Minimal |
| **EXPIRY DATE** | 31 August 2024 |

**DATE** 01 September 2021 **CHAIRPERSON** J Knight
(Professor J Knight)

cc: Supervisor : Dr N Israel

**DECLARATION OF INVESTIGATOR(S)**

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to submit an amendment of the protocol to the Committee. **I agree to completion of a regular progress report. For Minimal and Low studies, this is due annually on 31 December. For Medium and High Risk studies, this is due twice annually on 30 June and 31 December.**

Signature

2 / 09 / 2021
Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES

## 7.11 Appendix K: Histograms for each scale and subscale and descriptive statistics

**Figure 7.1**

*Distribution of the total scores for the Social Networking Addiction Scale (SNAS)*

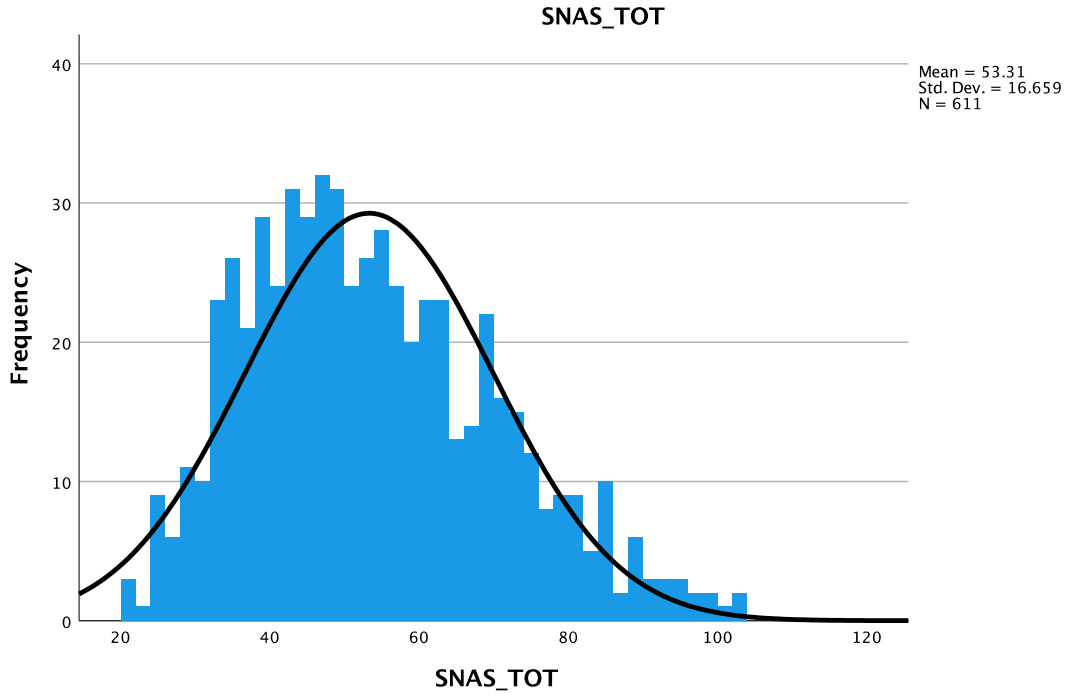


**Figure 7.2**

*Distribution for the Salience subscale of the Social Networking Addiction Scale (SNAS)*

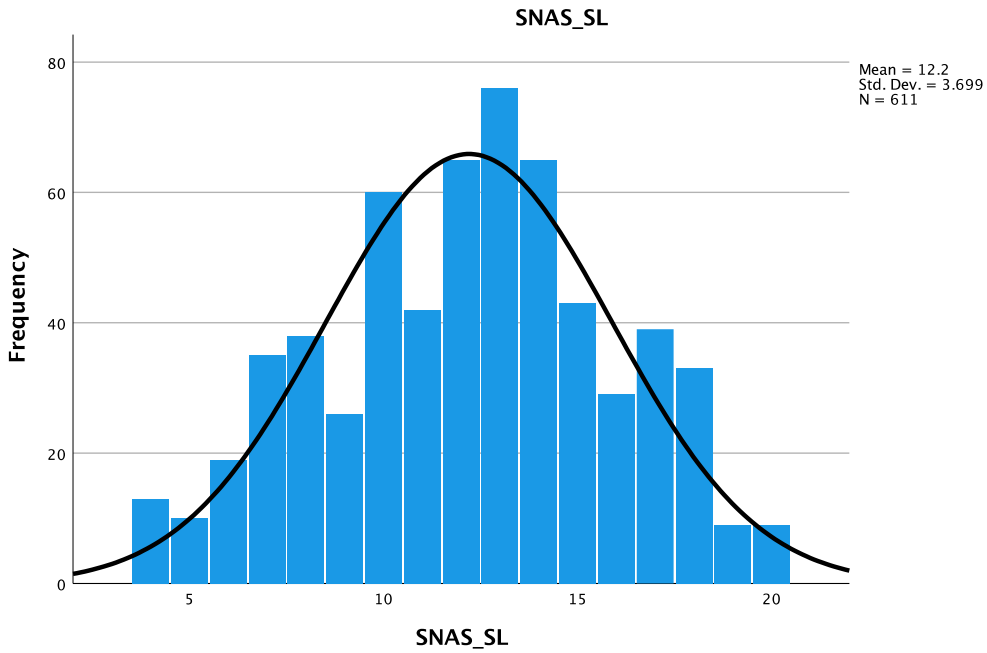



**Figure 7.3**

*Distribution for the Mood Modification subscale of the Social Networking Addiction Scale (SNAS)*

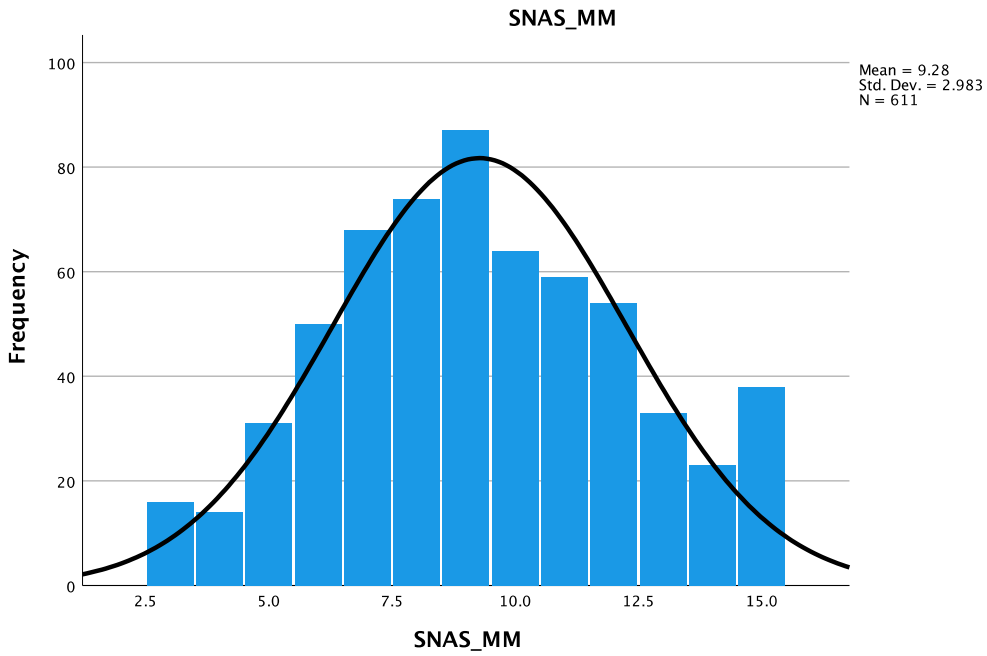


**Figure 7.4**

*Distribution for the Tolerance subscale of the Social Networking Addiction Scale (SNAS)*

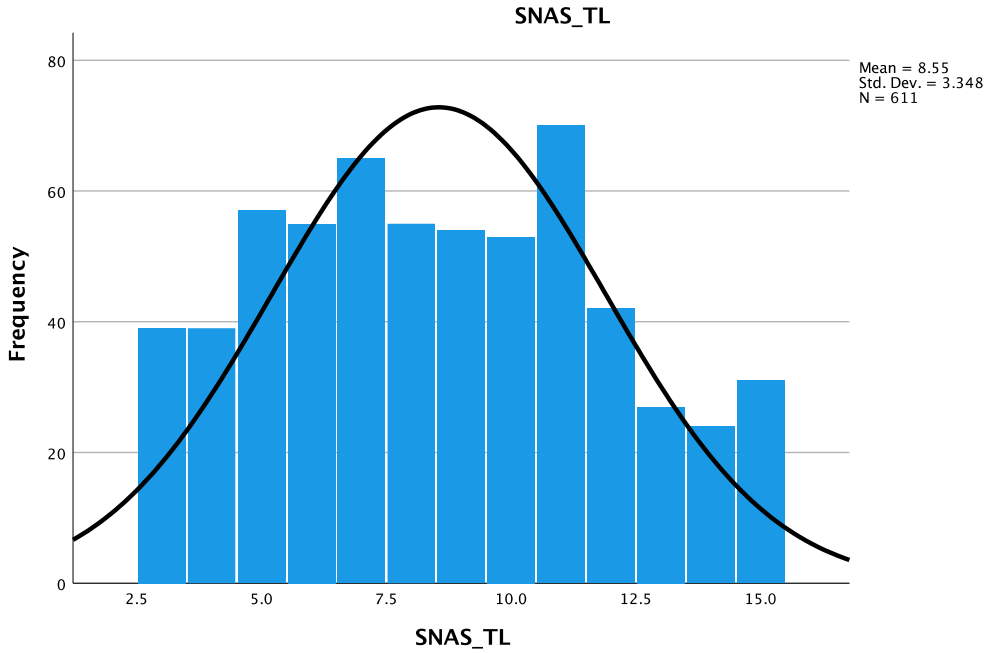



**Figure 7.5**

*Distribution for the Withdrawal subscale of the Social Networking Addiction Scale (SNAS)*

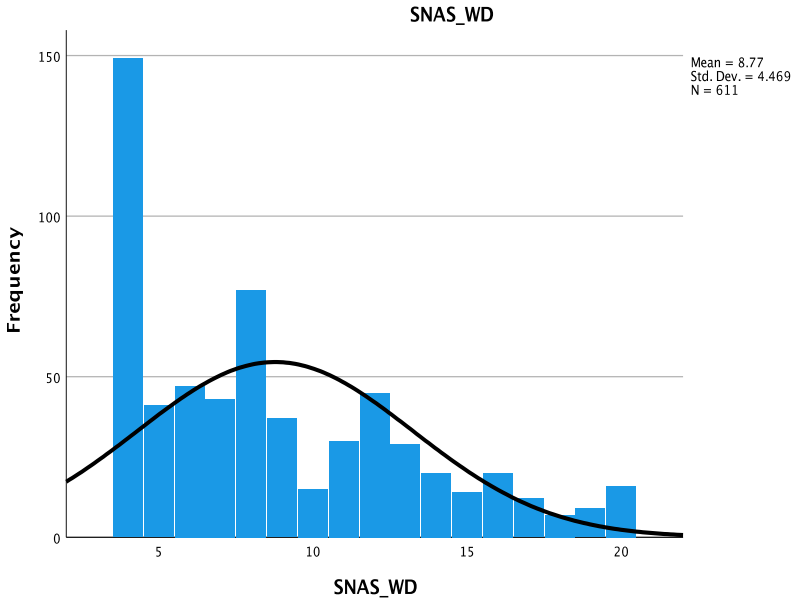


**Figure 7.6**

*Distribution for the Conflict subscale of the Social Networking Addiction Scale (SNAS)*

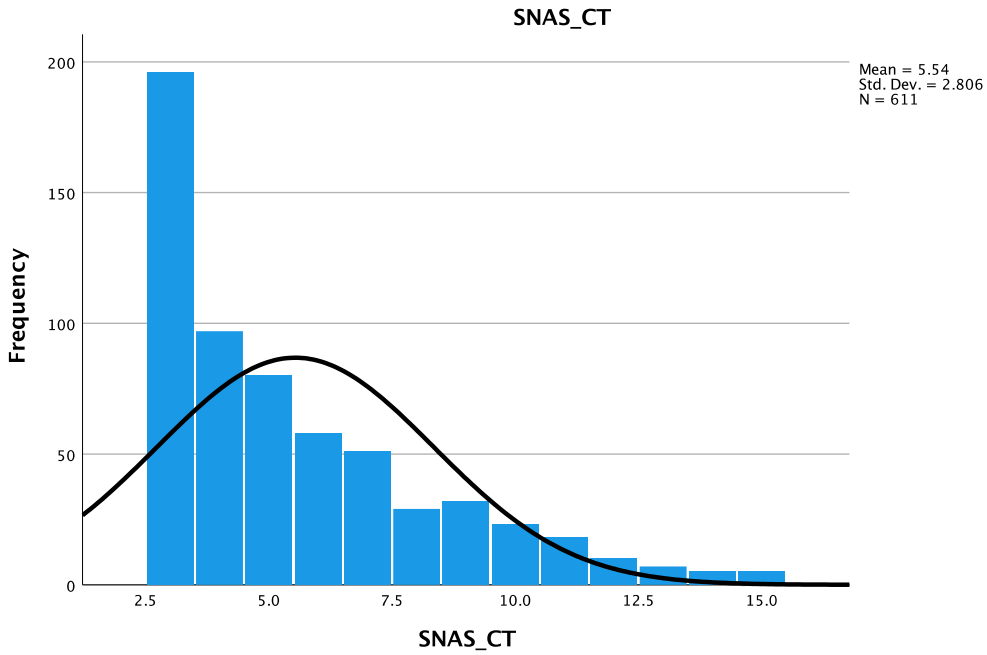



**Figure 7.7**

*Distribution for the Relapse subscale of the Social Networking Addiction Scale (SNAS)*

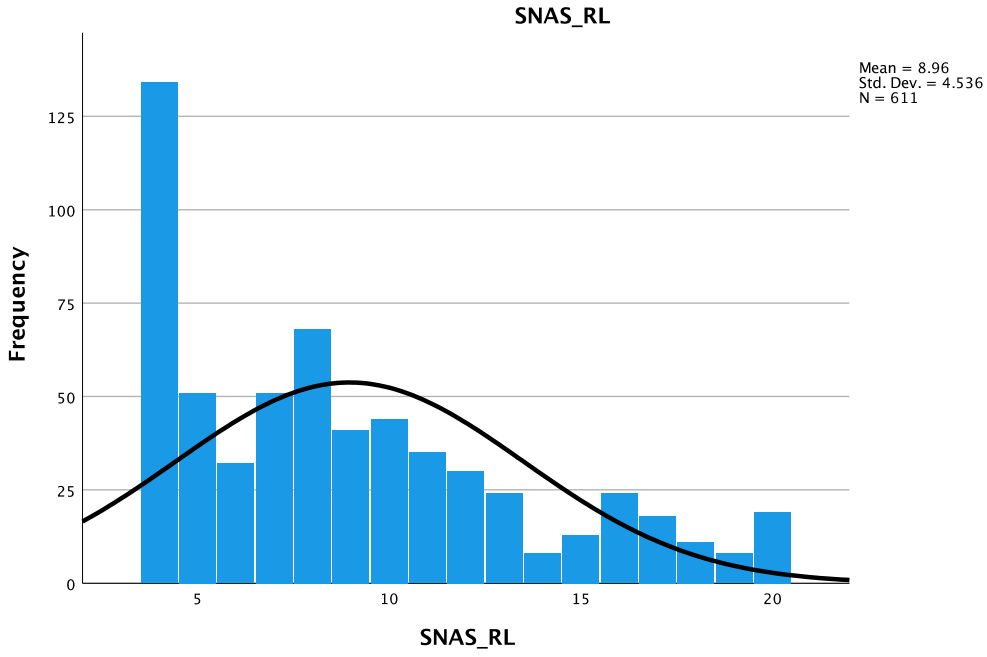


**Figure 7.8**

*Distribution of the total scores for the Depression, Anxiety and Stress Scales (DASS-21)*

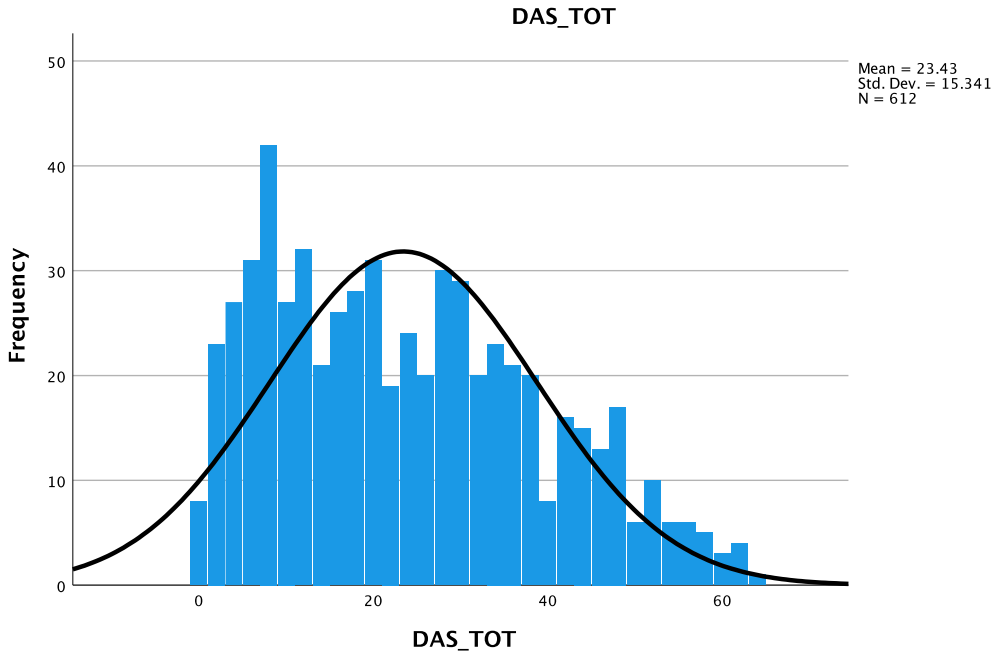



**Figure 7.9**

*Distribution for the Depression subscale of the Depression, Anxiety and Stress Scales (DASS-21)*

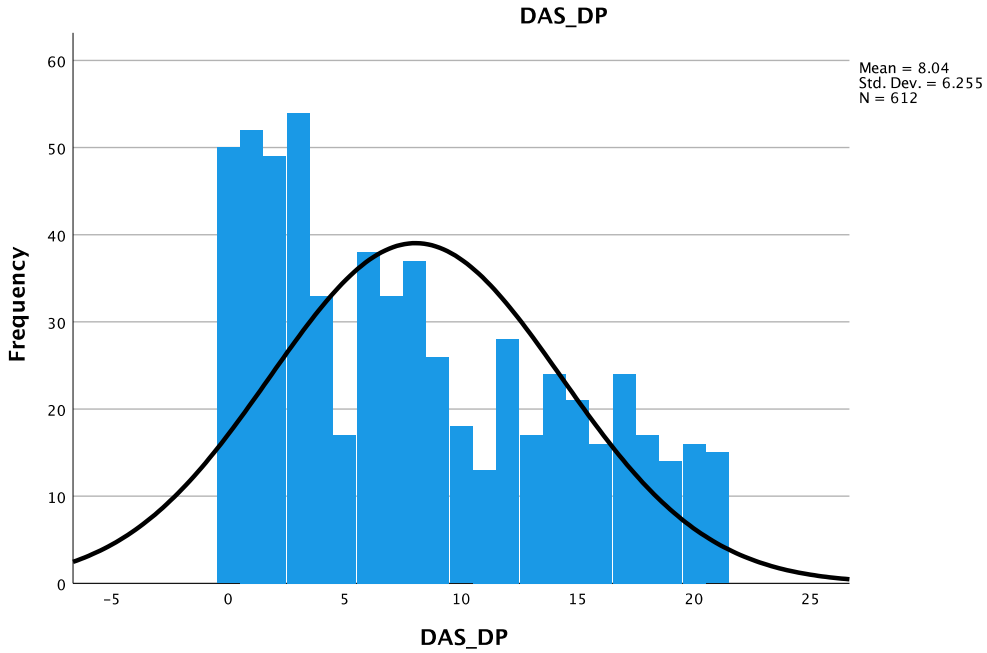


**Figure 7.10**

*Distribution for the Anxiety subscale of the Depression, Anxiety and Stress Scales (DASS-21)*

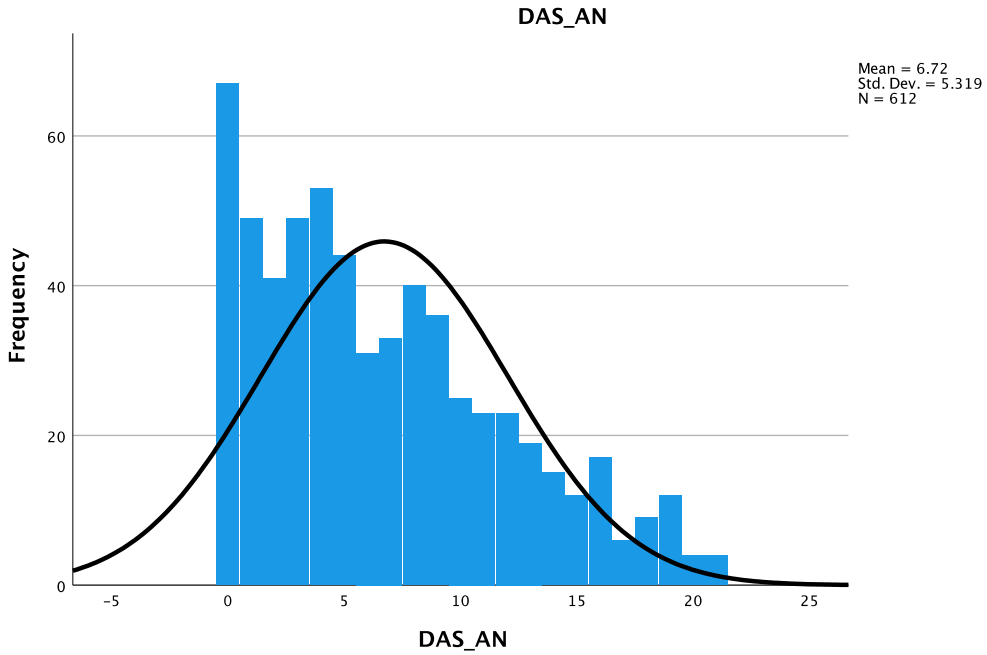



**Figure 7.11**

*Distribution for the Stress subscale of the Depression, Anxiety and Stress Scales (DASS-21)*

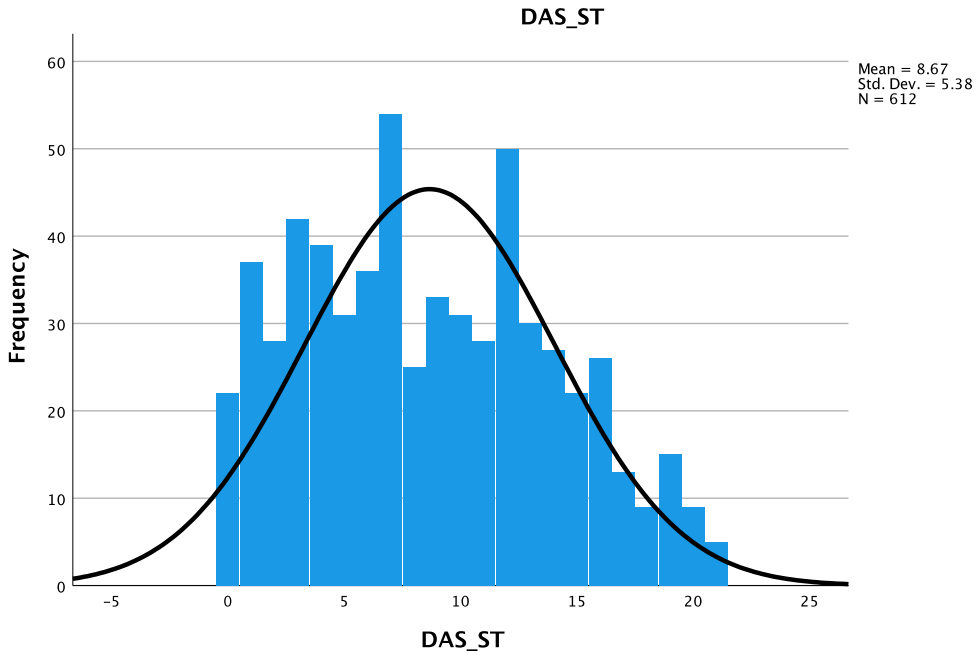


**Figure 7.12** *Distribution for Extraversion of the Big Five Inventory (BFI)*

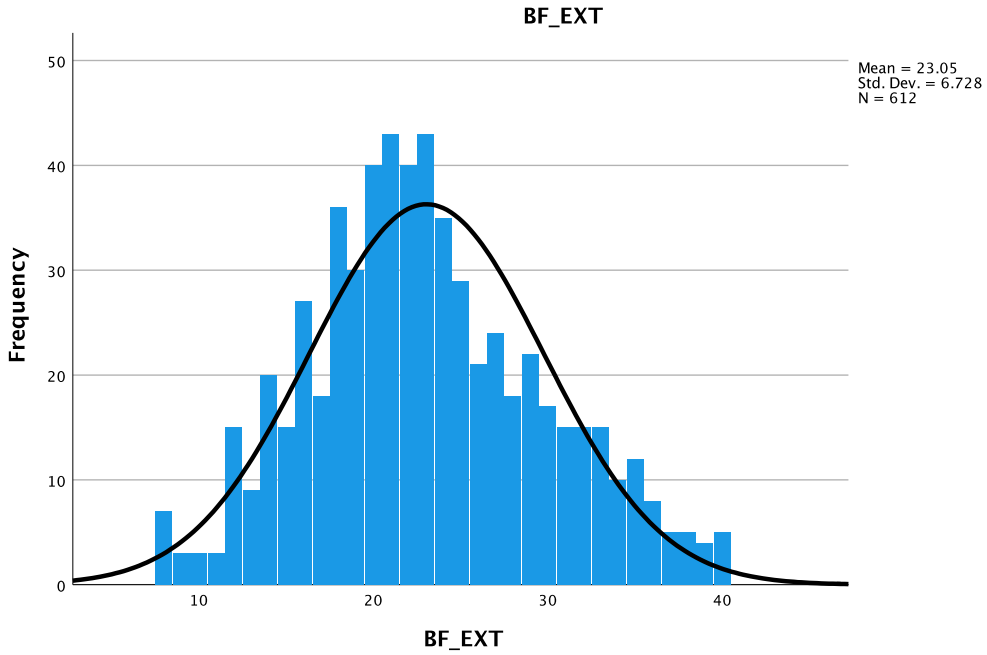



**Figure 7.13**

*Distribution for Agreeableness of the Big Five Inventory (BFI)*

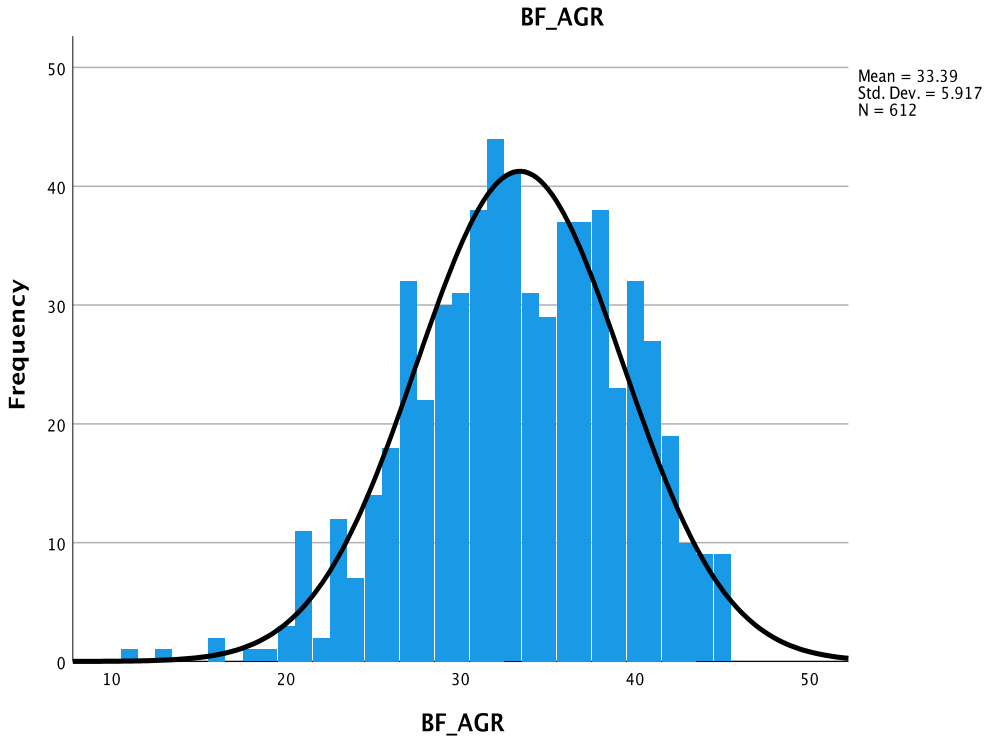


**Figure 7.14**

*Distribution for Conscientiousness of the Big Five Inventory (BFI)*

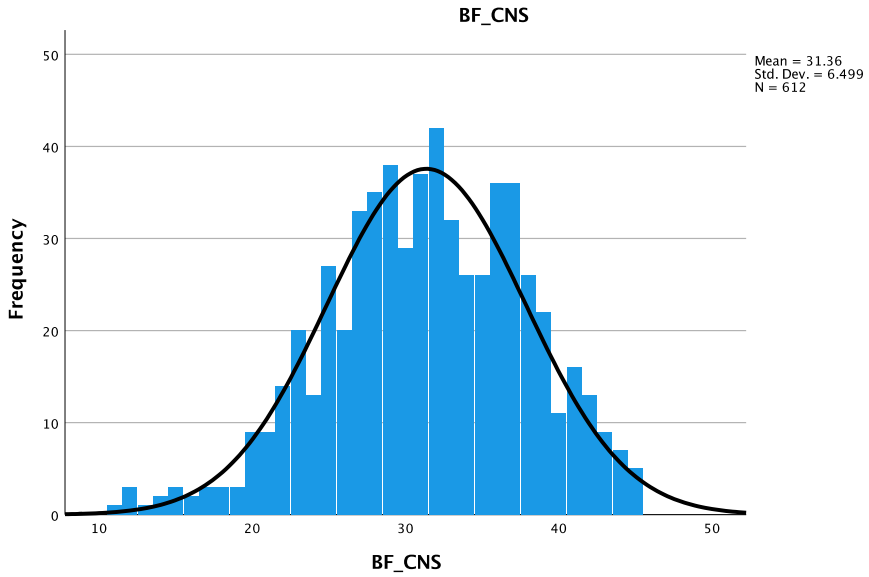



**Figure 7.15**

*Distribution for Neuroticism of the Big Five Inventory (BFI)*

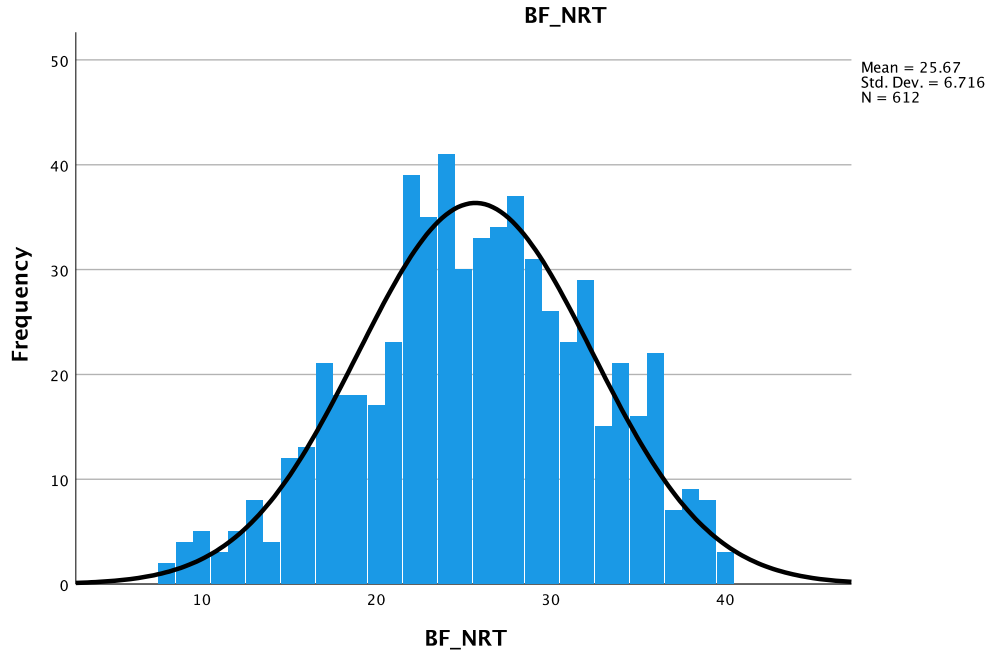


**Figure 7.16**

*Distribution for Openness of the Big Five Inventory (BFI)*

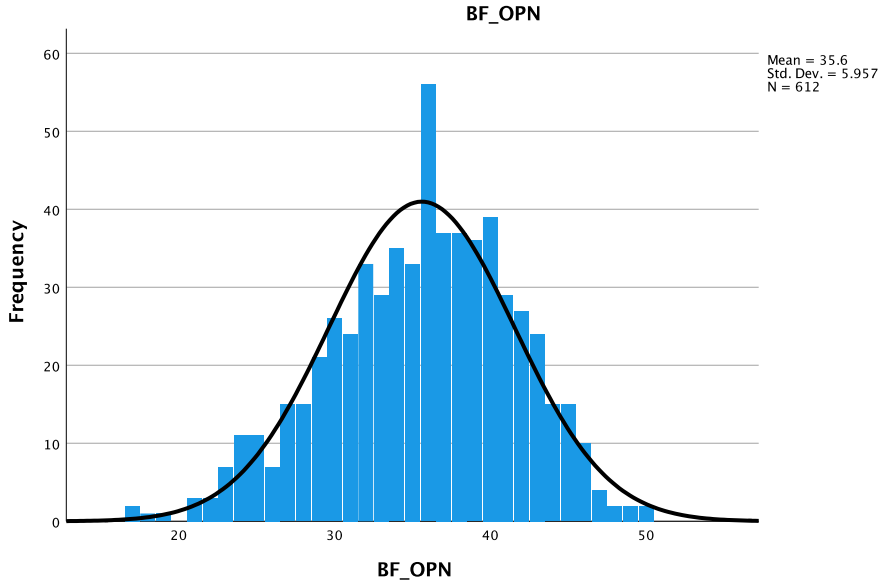



**Figure 7.17**

*Distribution for the Dating subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

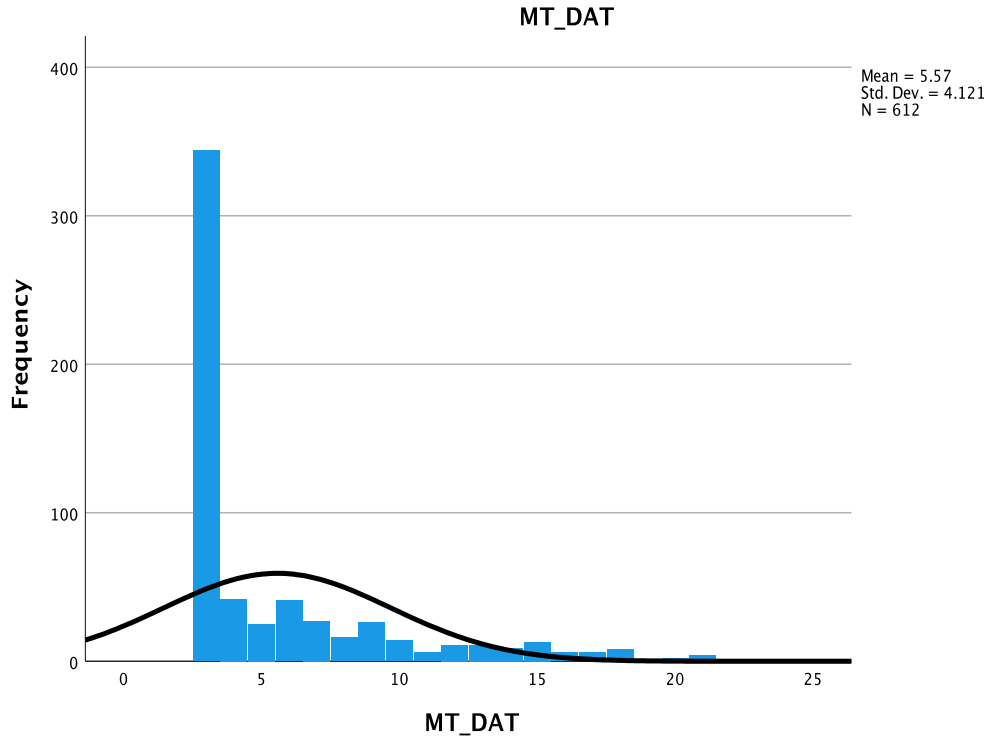


**Figure 7.18**

*Distribution for the New Friendships subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

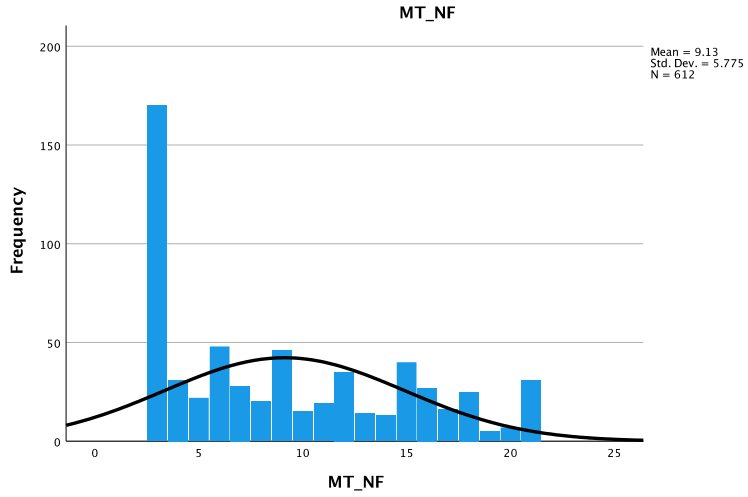



**Figure 7.19**

*Distribution for the Academic Purposes subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

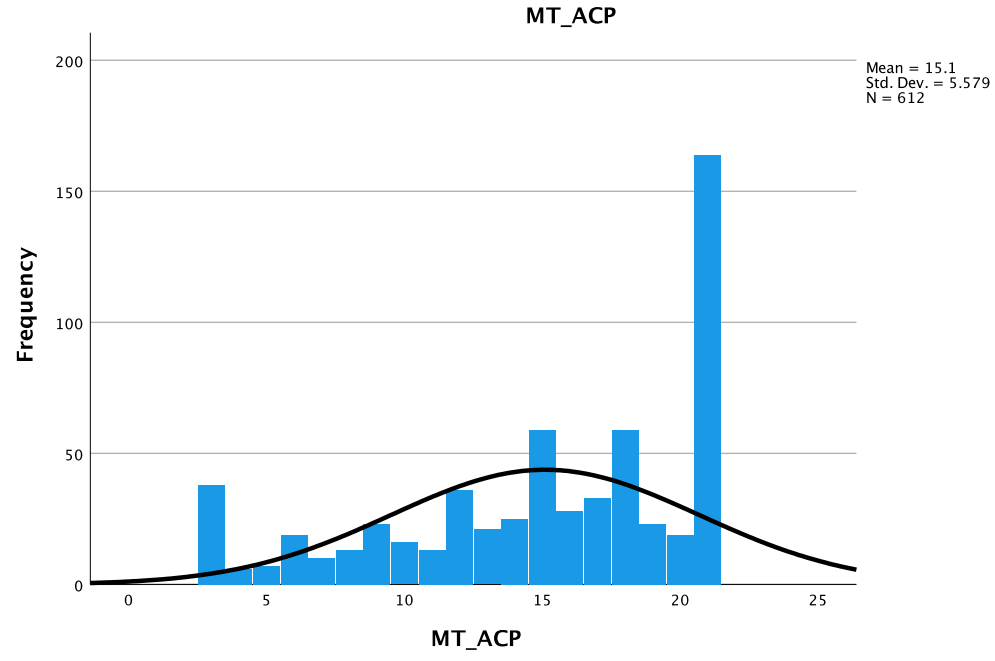


**Figure 7.20**

*Distribution for the Social Connectedness subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

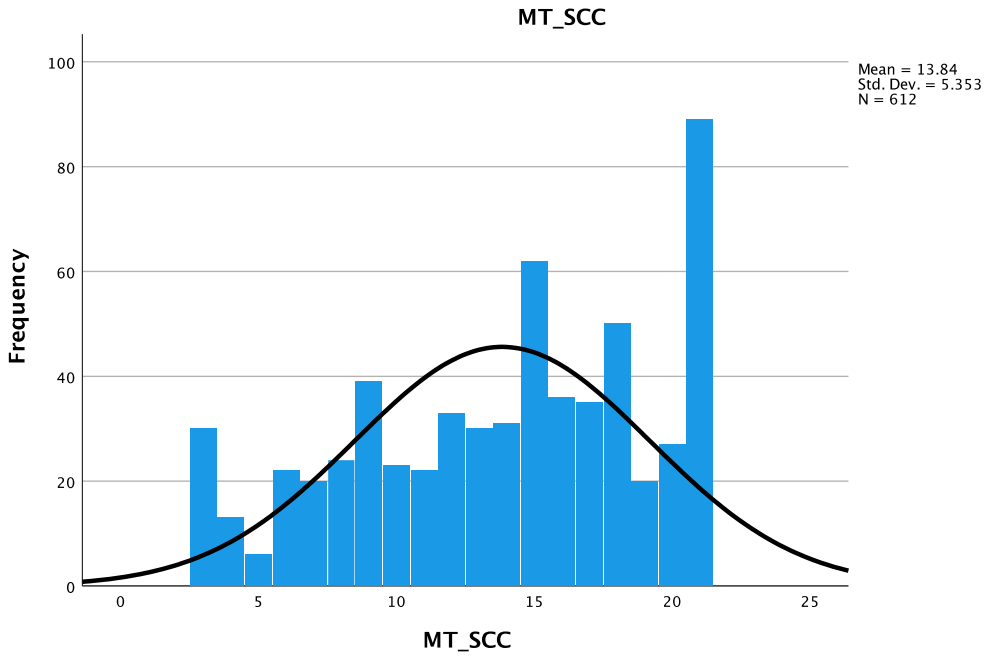



**Figure 7.21**

*Distribution for the Following and Monitoring Others subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

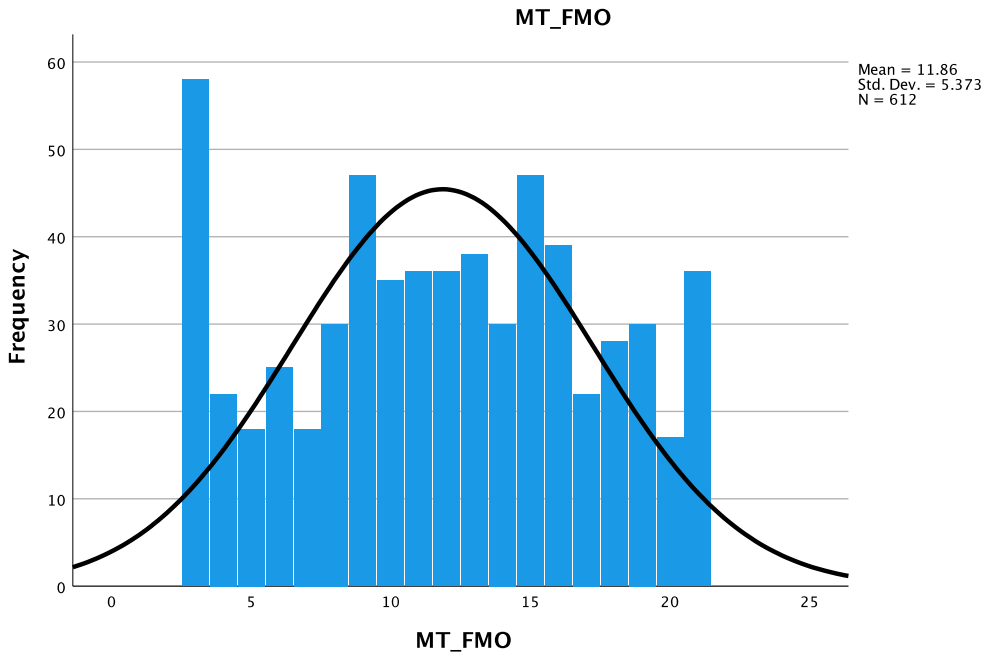


**Figure 7.22**

*Distribution for the Entertainment subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

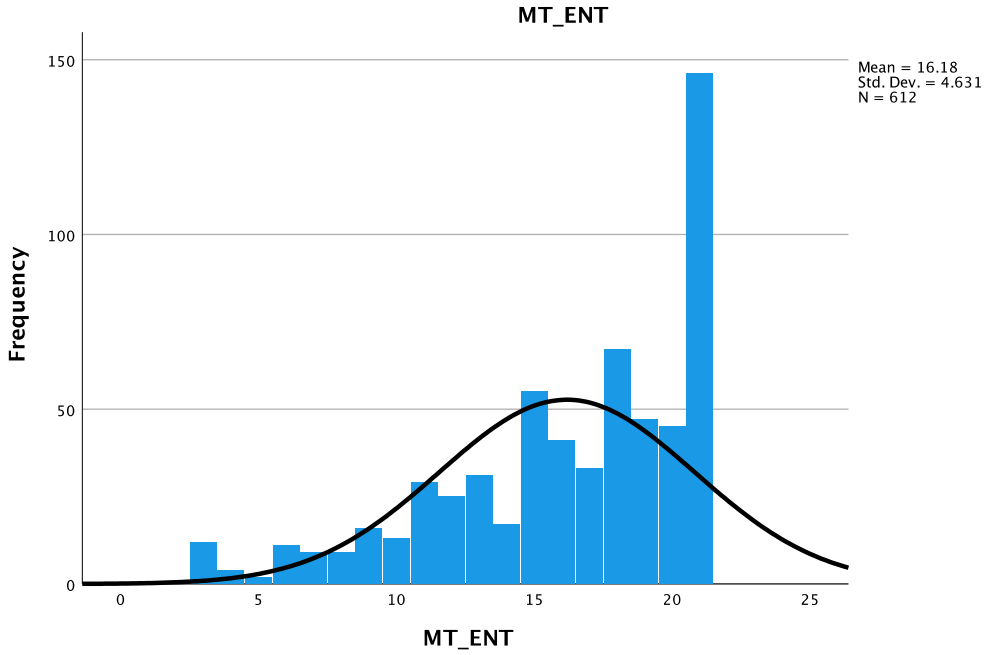



**Figure 7.23**

*Distribution for the Social Recognition subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

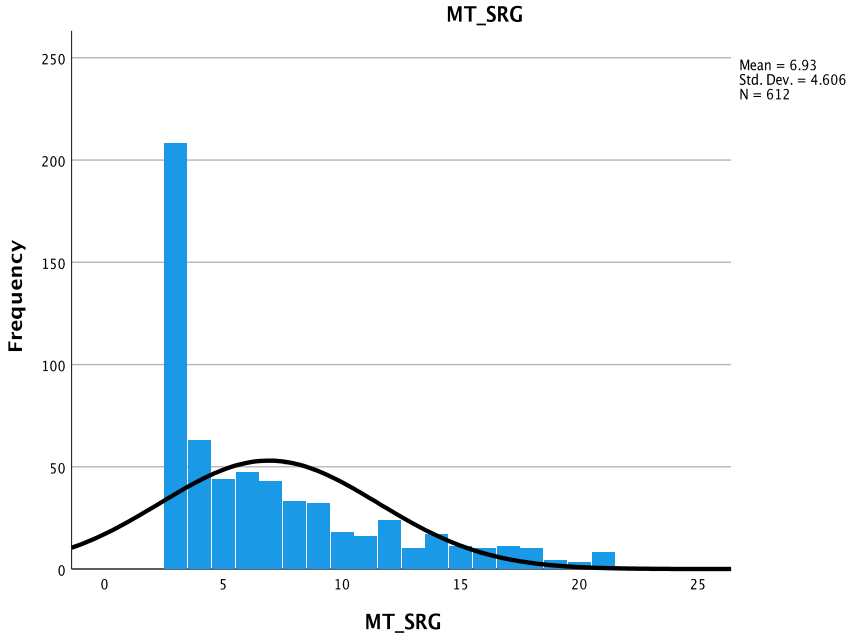


**Figure 7.24**

*Distribution for the Self-expression subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

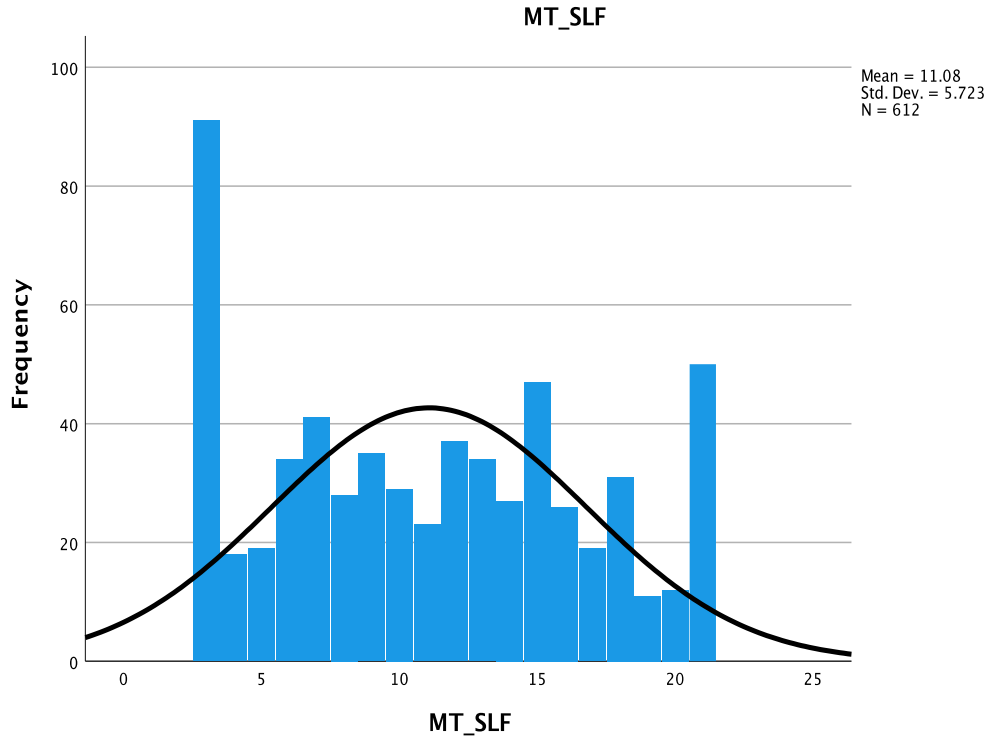



**Figure 7.25**

*Distribution for the Information subscale of the Scale of Motives for Using Social Networking Sites (SMU-SNS)*

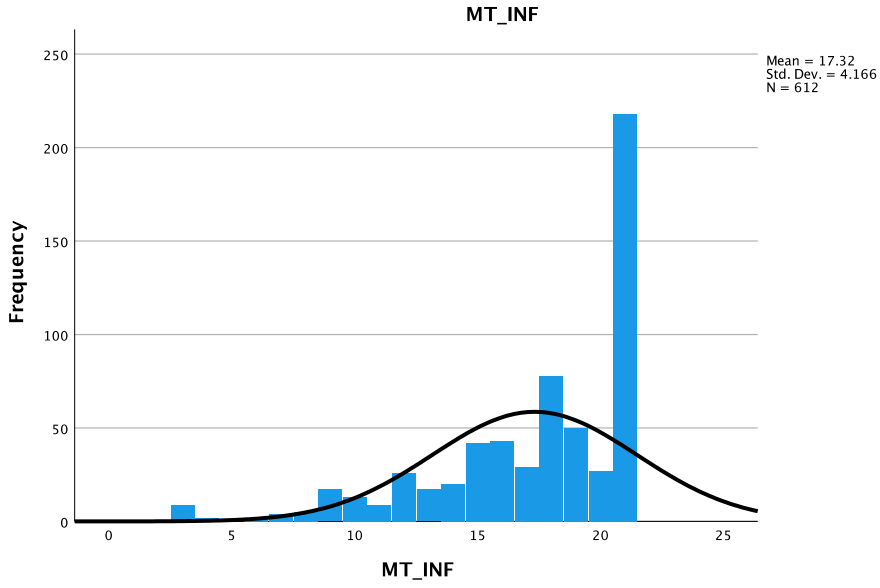
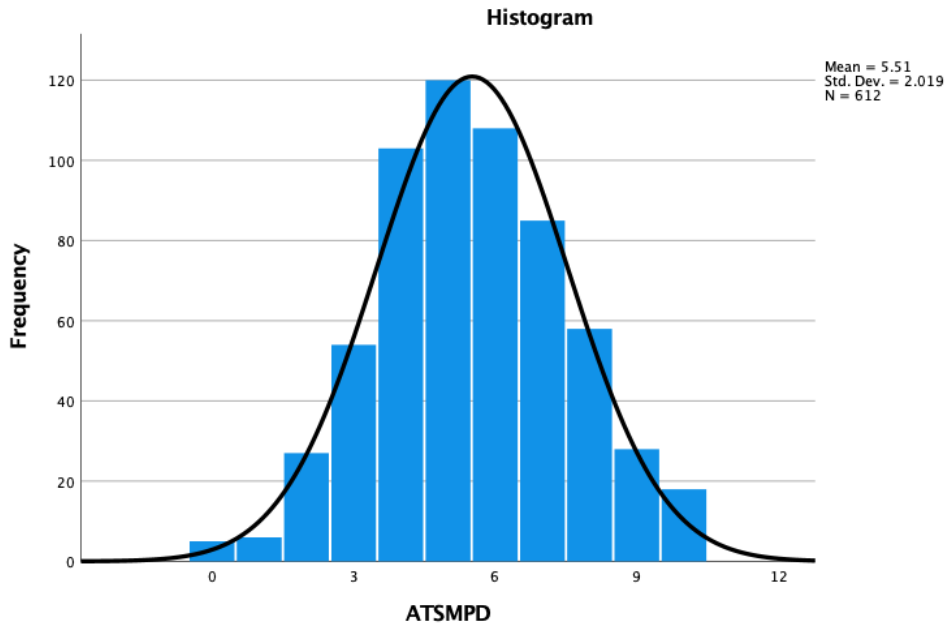


**Figure 7.26**

*Distribution for the average time spent on social media sites per day*



## 7.12 Appendix L: Supplementary Correlations

**Table 7.1**

*Pearson's correlation coefficients for Social Networking Addiction Scale (SNAS) (N=611)*

| Variables | Salience | Mood modification | Tolerance | Withdrawal | Relapse | Total |
|---|---|---|---|---|---|---|
| N = 611 | | | | | | |
| **Salience** | -- | | | | | |
| **Mood modification** | .506*** <.001 | -- | | | | |
| **Tolerance** | .585*** <.001 | .489*** <.001 | -- | | | |
| **Withdrawal** | .516*** <.001 | .467*** <.001 | .510*** <.001 | -- | | |
| **Relapse** | .514*** <.001 | .397*** <.001 | .576*** <.001 | .468*** <.001 | -- | |
| **Total** | .783*** <.001 | .682*** <.001 | .785*** <.001 | .777*** <.001 | .801*** <.001 | -- |

*** $p < .01$ (two-tailed).

**Table 7.2**

*Spearman's correlation coefficients for the conflict subscale of the Social Networking Addiction Scale (SNAS) (N-611)*

| Variables | Salience | Mood modification | Tolerance | Withdrawal | Relapse | Total |
|---|---|---|---|---|---|---|
| N = 611 | | | | | | |
| **Conflict** | .436***<br><.001 | .330***<br><.001 | .393***<br><.001 | .475***<br><.001 | **.595*****<br><.001 | .673***<br><.001 |

****p < .01 (two-tailed).*

**Table 7.3**

*Pearson's correlation coefficients for the Depression, Anxiety, and Stress Scales (DASS-21) (N=612)*

| Variables | Depression | Anxiety | Stress | Total |
|---|---|---|---|---|
| N = 612 | | | | |
| **Depression** | -- | | | |
| **Anxiety** | .685***<br><.001 | -- | | |
| **Stress** | .746***<br><.001 | .755***<br><.001 | -- | |
| **Total** | .907***<br><.001 | .891***<br><.001 | .917***<br><.001 | -- |

****p < .01 (two-tailed).*

**Table 7.4**

*Pearson's correlation coefficients for the Big Five Inventory (BFI) (N=612)*

| Variables | Extraversion | Agreeableness | Conscientiousness | Neuroticism | Openness |
|---|---|---|---|---|---|
| N = 612 | | | | | |
| **Extraversion** | -- | | | | |
| **Agreeableness** | .219***<br><.001 | -- | | | |
| **Conscientiousness** | .244***<br><.001 | .359***<br><.001 | -- | | |
| **Neuroticism** | -.333***<br><.001 | -.273***<br><.001 | -.331***<br><.001 | -- | |
| **Openness** | .290***<br><.001 | .225***<br><.001 | .260***<br><.001 | -.012<br>.766 | -- |

****p < .01 (two-tailed).*

**Table 7.5**

*Pearson's correlation coefficients for the Scale of Motives for Using Social Networking Sites (SMU-SNS) (N=612)*

| Variable | NF | ACP | SCC | FMO | ENT | SLF |
|---|---|---|---|---|---|---|
| N = 612 | | | | | | |
| **NF** | -- | | | | | |
| **ACP** | .203*** | -- | | | | |
| | < .001 | | | | | |
| **SCC** | .371*** | .240*** | -- | | | |
| | < .001 | < .001 | | | | |
| **FMO** | .184*** | .210*** | .520*** | -- | | |
| | < .001 | < .001 | < .001 | | | |
| **ENT** | .113*** | .138*** | .321*** | .306*** | -- | |
| | < .001 | < .001 | < .001 | < .001 | | |
| **SLF** | .374*** | .231*** | .375*** | .215*** | .218*** | -- |
| | < .001 | < .001 | < .001 | < .001 | < .001 | |

*Note.* NF = New Friendships, ACP = Academic Purposes, SCC = Social Connectedness, FMO = Following and Monitoring Others, ENT = Entertainment, SLF = Self-expression.
***$p < .01$ (two-tailed).

**Table 7.6**

*Spearman's correlation estimates for the subscales: Dating, Social Recognition, and Information of the Scale of Motives for Using Social Networking Sites (SMU-SNS)* (N = 612)

| SMU-SNS | NF | ACP | SCC | FMO | ENT | SLF | DAT | SRG | INF |
|---|---|---|---|---|---|---|---|---|---|
| **DAT** | .439*** | .048 | .192*** | .165*** | .008 | .204*** | -- | | |
| | < .001 | .237 | < .001 | < .001 | .838 | < .001 | | | |
| **SRG** | .390** | .142*** | .358*** | .369*** | .186*** | .487*** | .336*** | -- | |
| | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 | < .001 | | |
| **INF** | .099* | .188*** | .378*** | .228*** | .330*** | .346*** | .057 | 145*** | -- |
| | .015 | < .001 | < .001 | < .001 | < .001 | < .001 | .162 | < .001 | |

*Note.* NF = New Friendships, ACP = Academic Purposes, SCC = Social Connectedness, FMO =Following and Monitoring Others, ENT = Entertainment, SLF = Self-expression, DAT = Dating, SRG = Social Recognition, INF = Information.

**p < .05 (two-tailed); **p< .01 (two-tailed); ***p < .001 (two-tailed)*

**Table 7.7**

*Pearson's correlation coefficients for the Big Five Inventory (BFI) and the Scale of Motives for Using Social Networking Sites (SMU-SNS*) (N=612)

| Variables | EXT | AGR | CNS | NRT | OPN |
|---|---|---|---|---|---|
| **NF** | .119**<br>.003 | .012<br>.763 | -.060<br>.163 | .025<br>.535 | .078<br>.054 |
| **ACP** | .032<br>.426 | .153***<br><.001 | -.076<br>.060 | .060<br>.137 | .072<br>.076 |
| **SCC** | .030<br>.454 | .029<br>.474 | -.054<br>.186 | .229***<br><.001 | .083*<br>.039 |

| | | | | | |
|---|---|---|---|---|---|
| **FMO** | -.017<br>.674 | .102*<br>.011 | -.073<br>.072 | .308***<br><.001 | .020<br>.624 |
| **ENT** | -.137***<br><.001 | -.128**<br>.002 | -.269***<br><.001 | .243***<br><.001 | -.078<br>.053 |
| **SLF** | .161***<br><.001 | .052<br>.196 | -.003<br>.938 | .034<br>.398 | .187***<br><.001 |

*Note.* EXT = Extraversion, AGR = Agreeableness, CNS = Conscientiousness, NRT = Neuroticism, OPN = Openness to experience.
NF = New Friendships, ACP = Academic Purposes, SCC = Social Connectedness, FMO = Following and Monitoring Others, ENT = Entertainment, SLF = Self-expression.
**p < .05 (two-tailed); **p< .01 (two-tailed); ***p < .001 (two-tailed)*

**Table 7.8**

*Spearman's correlation coefficients for the Big Five Inventory (BFI) and the Scale of Motives for Using Social Networking Sites (SMU-SNS*) (N=612)

| **Variables** | **EXT** | **AGR** | **CNS** | **NRT** | **OPN** |
|---|---|---|---|---|---|
| **DAT** | .111**<br>.006 | -.121**<br>.003 | -.111**<br>.006 | .000<br>.992 | .004<br>.920 |
| **SRG** | .061<br>.129 | -.119**<br>.003 | -.150***<br><.001 | .183***<br><.001 | .036<br>.369 |
| **INF** | -.004<br>.929 | .045<br>.270 | .019<br>.646 | .074<br>.068 | .109**<br>.007 |

*Note.* EXT = Extraversion, AGR = Agreeableness, CNS = Conscientiousness, NRT = Neuroticism, OPN = Openness to experience. DAT = Dating, SRG = Social Recognition, INF = Information
**p < .05 (two-tailed); **p< .01 (two-tailed); ***p < .001 (two-tailed)*