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Investigating the Relationship Between Social Media Use, Big Five Personality, and Well-Being

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Abstract

This study investigates the relationship between social media use, Big Five personality traits, and subjective well-being to determine how different personality traits relate to different measures of social media use and well-being, and which variable influences well-being the most. Participants completed established measures for the Big Five personality traits, social media engagement, social media intensity, satisfaction with life, positive and negative affect, and depression. Results showed that extraversion predicted social media engagement and intensity, and social media time. Conscientiousness predicted spending less time on social media. In addition, conscientiousness, extraversion, agreeableness, and neuroticism predicted positive well-being stronger than did social media use. When conducting five separate regression analyses with a social media use variable and a different personality variable each time, four times (conscientiousness, extraversion, agreeableness, and neuroticism) the personality variable predicted negative well-being more strongly than did the social media use variable. However, negative well-being was predicted more strongly by social media use than by the fifth personality variable, openness to change. Results are discussed and possible future investigations are suggested.

Keywords: social media use; social media engagement; social media intensity; Big Five personality; positive well-being; negative well-being; positive affect; negative affect; subjective well-being

Introduction

These days, social media are inextricably intertwined with our lives and thus, with who we are as a person and how we fare. Inquiries into personality and well-being are long-standing, and many researchers have investigated how different forms of media have affected either or both (for personality and media, e.g., Correa et al., 2010; Xu et al., 2016; for well-being and media, e.g., Özgüven & Mucan, 2013; Przybylski et al., 2013). As technology keeps changing, it is worth continuing the existing line of research to further advance our understanding of such multifaceted interactions.

The study presented here builds on prior work, especially Correa et al.'s (2010), and Özgüven and Mucan's (2013). The study's purpose was to investigate the relationship between social media use, Big Five personality traits, and subjective well-being (hereafter: well-being) to determine how different personality traits relate to different measures of social media use and well-being, and which variable influences well-being the most. This research develops a more nuanced understanding of how these three variables influence each other as a triad. If society generally strives to improve its members' well-being, then gaining insight into factors that increase or decrease well-being has the potential to improve positive aspects of society by improving the lives of the people who make up society. For example, people who experience high well-being are more likely to overcome physical illness (e.g., Lamers et al., 2011) and experience higher quality of life (e.g., Finocchiaro et al., 2014). The link between well-being and a variety of positive social dimensions (e.g., social integration, social contribution) is well established (e.g., Keyes, 1998). On the other hand, low well-being has been linked to violence against women (Pourabdol et al., 2019), pathological gaming among adolescents (Lemmens et al., 2011), and other actions that undermine social order or are considered undesirable social outcomes.

Information learned from this study at the personality trait level could inform a number of audiences such as mental health counselors, parents, and others along the lines suggested by Chou et al. (2009). Results could be used to develop health information campaigns to increase young adults' well-being. While there is information readily available that warns of the potentially negative effects of social media use, results from the study at hand are specific to dominant personality traits. Targeted campaigns are more likely to be effective and lead young adults to be more conscious about the effect social media use and/or their dominant personality trait has on their well-being than general campaigns whose persuasive appeals may simply not reach certain segments of the intended audience. A

possible outcome of such a health campaign would be better adjusted young adults experiencing higher well-being who are more likely to become well-functioning and contributing members of society as a whole.

Literature Review

Three main variables inform the study at hand, 1) social media use, 2) personality, and 3) well-being. Each of these has been investigated abundantly. The majority of prior research has considered two of these three variables in various pairs, while a smaller body of literature has investigated all three together as a triad, or each one in conjunction with a fourth one (e.g., fear of missing out). The study at hand contributes to the first two of these bodies of work. Building on a review of literature, the study investigates first the pairing of social media with personality, then with well-being, and then all three variables together in a triad. Due to space constraints, the following sections present only the most relevant literature, which can serve as starting points for researchers interested in these variables.

This section first presents key pieces related to the variable of social media use, then central literature on the variable and theoretical construct of Big Five personality. After that, pertinent literature that connects these two variables is presented. The fourth section presents the third main variable, well-being, and part of its theoretical framework, followed by two sections relating relevant literature on well-being and social media use, and then well-being and personality literature. In this way, all six bodies of literature (three on the three main variables, and three on the connections between those variables) are briefly addressed.

Social Media Use

Social media use is a broad concept that includes the use of a variety of specific platforms (e.g., Twitter, Facebook), as well as a variety of "use" behaviors. Research efforts to measure social media use often focus on social media engagement (e.g., Przybylski et al., 2013) and/or social media intensity (e.g., Salehan & Negahban, 2013) conceptually. Much of this work is based on the social media intensity scale (Ellison et al., 2007) – also referred to as Facebook intensity scale because the researchers asked about Facebook and social media interchangeably – where intensity was operationalized by asking about the number of minutes one spends using social media per day, and one's number of social media friends.

Fuster et al. (2017) report a positive correlation between social network intensity and social media engagement. This correlation follows logically because social media engagement is also often

operationalized by measures of time, such as number of minutes/hours spent on social media per day, years of using social media, or frequency of social media access within a certain time period (e.g., Przybylski et al., 2013). The operationalized overlap between social media engagement and intensity via time measures continues in recent work. Increased time or frequency of social media use, referred to as either "engagement" or "intensity" by the authors, was positively associated with positive adjustment, defined as "less internalizing problems and more prosocial support" (Swirsky et al., 2021, p. 1), network size but not subjective well-being (Koç & Turan, 2020), affective, behavioral, and cognitive engagement (Ni et al., 2020), fear of missing out and indirectly with well-being (Roberts & David, 2020), and both higher and lower academic self-efficacy depending on specific social media platform (McNallie et al., 2020). These sources show that engagement, intensity, and time are central concepts in the context of social media use, including in work that relates social media use to well-being.

There are other efforts to operationalize social media use, focusing more on measures of skill or ability. Based on a review of about 20 sources, Peng and Zhu (2011) identified five main types of social media or internet skills measures, all correlated. They labeled the five main types as online skill, online activity, online time, diversity of online place, and diversity of online method. Notably, time spent online is one of the five types of skill measures, as are the actual tasks performed or platforms accessed, comparable to the way Ellison et al.'s Facebook intensity scale has been adapted to other social media platforms such as Twitter (e.g., McNallie et al., 2020), or social networks (Koç & Turan, 2020), and has been used with non-specific reference to social media (Swirsky et al., 2021). Some researchers (e.g., Correa et al., 2010) even use additive measures to combine the use of different types of social media, such as social network use and instant message use, because the components are correlated strongly.

Overall, this review demonstrates that researchers are operationalizing social media use in several ways, but also use different labels for the same thing as they overlap in operationalization. Therefore, results of social media use studies are difficult to compare; researchers should take care not to overstate interpretations. In the next sections, a review of more specific literature on online/internet technologies or social media in relation to personality and well-being follows the general Big Five personality and the general well-being literature reviews.

The Big Five Personality Traits

For the study at hand, the term "personality" will be used to refer to

the Big Five personality trait taxonomy as presented by John and Srivastava (1999). The five-factor personality model, typically referred to as "Big Five," is considered to be its own theoretical framework and has been investigated and related to many other variables of interest (Anglim et al., 2020; Costa & McCrae, 1995; McCrae & John, 1992). The main concepts associated with each personality trait are presented here briefly and define the theoretical assumptions of the approach. The remainder of the manuscript will refer to the traits only by their overall labels.

The Big Five personality traits are openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (OCEAN). Openness to experience generally refers to people's curiosity, interest in or adaptability to change, and creativity. Conscientiousness refers to people's level of efficiency, organization, self-discipline, and dependability. Extraversion describes people who are sociable, assertive, and outward-oriented. Agreeableness is characterized by compassion and cooperation. Finally, neuroticism is sometimes described by its antonym, emotional stability. People high on neuroticism are often anxious and may lack impulse control. Each of the OCEAN traits is arranged on a continuum from high to low, and each has both positive and negative connotations.

Internet Technology and Personality

The following sections summarize the more recent personality and technology/social media literature briefly by personality trait. A recommended summary of earlier research is provided by Correa et al. (2010).

Openness to experience**.** The literature is quite unanimous in relating openness to a variety of technologies. Witt et al.(2011, p. 766) indicate that "openness was the strongest predictor of technology use." Openness is positively related to mobile gaming (Seok & DaCosta, 2015), and social media use (Correa et al., 2010; Kalmus et al., 2011; Özgüven & Mucan, 2013). Prior work also shows that openness is positively related to technology's perceived ease of use (Svendsen et al., 2013), and the use of the internet for entertainment purposes (Kalmus et al., 2011). A study that related openness negatively to general technology use was conducted by Parida et al. (2016). Overall, for people with high scores on the openness personality trait one would expect high or positive scores on technology-related measures, such as social media use.

Conscientiousness. Prior research regarding conscientiousness and technology measures is mostly in agreement in its more recent conclusions. In 2006, Landers and Lounsbury concluded that conscientiousness is negatively related to total internet usage, but

since then, Mark and Ganzach (2014) reported that conscientiousness is positively related to global internet use. Similarly, conscientiousness is said to positively relate to both perceived and actual use of technology (Barnett et al., 2015); social media use (Özgüven & Mucan, 2013); and general technology use (Parida et al., 2016). Biolcati et al. (2018) report that conscientiousness is a strong predictor of Facebook addiction. While addiction itself is negatively laden, it certainly indicates high usage. Witt et al. (2011) concluded conscientiousness is negatively related to videogame playing. This result is not a direct contradiction, but instead these variations in results seem to indicate that the relationship between conscientiousness and technology is complex and nuanced. Results may vary based on the specific technology studied.

Extraversion**.** A number of studies found significant associations between extraversion and some type of internet-related technology use. For example, extraversion was positively correlated to social media use, particularly for both male and female young adults (Correa et al., 2010), and a variety of Facebook behaviors (Gosling et al., 2011; Koban et al., 2018); and more likely to be associated with cell phone addiction (Roberts et al., 2015) and Facebook addiction (Biolcati et al., 2018). Extraverts are more likely to spend more time on text messaging (Ehrenberg et al., 2008); perform the most different types of internet activities and global internet use (Mark & Ganzach, 2014); and likely to use positive emotion words on Twitter (Qiu et al., 2012).

In contrast, Xu et al. (2016) report that extraverts are less likely to adopt mobile gaming apps. Barnett et al. (2015) conclude that extraverts are less likely to use technology. Özgüven and Mucan (2013) did not find a significant correlation between extraversion and social media use. In sum, much of the reviewed literature since 2010 finds positive and often strong associations between extraversion and a variety of internet-related technologies. However, some contrary results exist as well.

Agreeableness**.** The literature on agreeableness is somewhat sparse, and also mixed. Seok and DaCosta (2015) found that agreeableness was most significant in predicting frequency and number of hours spent playing mobile games. According to Özgüven and Mucan (2013), agreeableness correlated positively with social media use, and also general technology use (Parida et al., 2016). According to Qiu et al. (2012), those high on agreeableness were less likely to use negation words on Twitter.

Neuroticism**.** Prior research on neuroticism and technology use is not consistent. Some research concludes that higher neuroticism scores

relate negatively to perceived and actual use of technology (Barnett et al., 2015), and internet use for information services for men (Hamburger & Ben-Artzi, 2000). On the other hand, researchers found that neuroticism was positively related to internet use for social services for women (Hamburger & Ben-Artzi, 2000); global internet use (Mark & Gazach, 2014); social media use (Özgüven & Mucan, 2013); general technology use (Parida et al., 2016); Facebook addiction (Biolcati et al., 2018); and increased time spent texting (Ehrenberg et al., 2008). In addition, Correa et al. (2010) found that emotional stability (i.e., lower neuroticism) was negatively related to social media use overall, but that men with greater degrees of emotional instability (i.e., higher neuroticism) were more regular users. Emotional instability was also found to be positively associated with cell phone addiction by Roberts et al. (2015).

As the literature reviewed above shows, each personality trait relates differently to a number of different online technologies. While there may be some similarities, such as extraversion and openness to experience both being positively related to social media use, such similar associations don't necessarily hold when pairing the same traits with different technologies. Extraversion does not relate positively to likelihood of general technology use (Barnett et al., 2015), while openness to experience does (Witt et al., 2011). In addition, at times, investigations of the same relationship have found opposing results, such as extraversion's positive relationship with social media use according to Correa et al. (2010), but no significant finding for this relationship according to Özgüven and Mucan (2013). Thus, researchers should use care in both operationalization and interpretation of variables. Each personality trait should be investigated separately, and results should be generalized with care as different researchers often look at different types of technology and direct comparison of results is not always possible. Based on the literature reviewed above, the following research statements were formulated.

RQ1: What is the relationship between the Big Five personality traits and social media use?

H1: Extraversion and openness will relate positively to social media use.

Well-Being

Well-being has been operationalized in a variety of ways (Ryan & Deci, 2001) and is based on the theoretical notion that well-being divides into two related, but separate components, hedonistic (i.e., subjective) or eudaimonic (i.e., psychological) well-being (Diener et al., 1999; Ruff & Keyes, 1995). Prior research conceptualizes subjective well-being as resulting from higher positive emotions and

lower negative emotions (a statistically negative relationship between the two emotional states; Diener, 1984). Similarly, this study operationalizes positive well-being (PWB) to include satisfaction with life and positive affect, and negative well-being (NWB) to include depression and negative affect. In contrast to prior work, this study posits that it is possible for both emotional states to exist simultaneously at high levels, and that each sub-type can thus influence well-being independently. The operationalization will be discussed in more detail in the Methods section.

In its iterations, well-being has been linked to many concepts. For example, Myers and Diener (1995) found that health is correlated most strongly with subjective well-being, but personality and socioeconomic status are "runners-up." Other researchers concluded that depression negatively correlates with satisfaction with life, while positive emotions correlate positively with satisfaction with life (Schimmack et al., 2004). DeNeve and Cooper (1998) showed that negative emotions and personality components correlate positively with each other. Positive emotions and personality components correlate negatively with each other.

Social Media Use and Well-Being

In the early days of web research, Kraut and colleagues published two articles on the so-called "Internet Paradox" (Kraut et al., 1998; Kraut et al., 2001). The earlier publication concluded that increased internet use leads to reduced psychological well-being for new internet users. This result was met with great skepticism. The later publication then qualified earlier results somewhat, indicating that "internet use was associated with better outcomes for extraverts and worse outcomes for introverts" (p. 64) with regard to well-being.

Since then, our understanding of the relationship between internet-related technology and overall well-being has become more nuanced, but it remains complex. For this reason, it is difficult to point to one source that adequately summarizes research in this area. Correa et al. (2010) may serve as a good starting point into the literature. The authors found that life satisfaction and social media use were negatively correlated, a result supported by Przybylski et al. (2013) who concluded that more social media engagement led to lower life satisfaction. However, Özgüven and Mucan (2013) reported that life satisfaction was positively correlated with social media use. Twenge (2017) differentiated that more social media use led to higher rates of unhappiness among teens, but also explained that the highest rates of unhappiness were experienced by teens with no screen time. Campisi et al. (2015) studied social network use and concluded that quality of life differed among network users as people's positive or negative associations with the social network

itself were related to higher or lower quality of life respectively. Hardy and Castonguay (2018) pointed to age as a dividing factor, finding that those 30 or older were more likely to feel close to a nervous breakdown when using many social network sites, but those younger than 30 were less likely to feel that way even when using many social network sites.

Campisi et al. (2015) concluded that frequency of social network use did not relate to quality of life. Frequency was operationalized by asking subjects to estimate how many times per week they logged on to a social media site. Przybylski and colleagues (2013) labeled such a measure as social media engagement in their work. Others (e.g., Whaite et al., 2018) similarly used frequency of access as social media use measure, or used participants' estimate of time spent as operationalization (e.g., Correa et al., 2010; Gosling et al., 2011; Whaite et al., 2018). Relatedly, Ellison et al. (2007) coined "social media intensity" as a use measure because they believed it would be "a better measure of Facebook usage than frequency or duration indices" (p. 1150). The authors found that social media intensity correlated positively with psychological well-being and even indicated that Facebook usage could benefit those with low life satisfaction. These results suggest that social media engagement and social media intensity have the exact opposite effect on life satisfaction, though both measure aspects of social media use and Fuster and colleagues (2017) found a positive correlation between the two in a direct comparison.

A broader, related construct is internet connectedness by Leung (2009). The construct consists of three main dimensions, the history and context dimension (such as number of years of usage, type of technology used, etc.), the scope and intensity dimension (addressing usage goals/motivations, activity scope/type, and activity intensity/frequency), and centrality. Centrality measures how important the internet is to people's life, and their positive or negative evaluation of it. Leung showed that internet connectedness correlated with quality of life as measured by the instrument developed by Diener et al.(1985). Those who were more reliant on their computer were less satisfied with their lives, but those who felt more positively about the internet had higher quality of life.

Also attempting to incorporate a variety of use measures, Peng and Zhu (2011) combined time, activities, skills, expertise, and contextual diversity into a concept labeled "sophistication of internet usage" (p. 424). They related this concept to both positive and negative life outcome expectations with outcome expectations as antecedents. They found that positive outcome expectations related to higher internet usage sophistication. The authors thus established that

components of well-being can be a predictor variable when related to internet use.

As shown, while theory-building literature relates Facebook use to social capital and psychological well-being (Ellison et al, 2007), the literature on social media use and well-being is inconsistent and at times directly conflicting. No clear, overarching pattern has emerged to be formulated into a specific theory; therefore, no specific hypothesis was advanced for the study at hand and instead a broad research question was formulated.

RQ2: What is the relationship between social media use and well-being?

The theoretical contribution of this study's findings will help establish trends within the existing literature and contribute to future meta-analytic work that may eventually lead to a specific theory or theoretical approach on well-being and social media.

Personality and Well-Being

The literature on personality and well-being, broadly defined to include satisfaction with life, positive affect, and happiness, as well as the absence of negative affect, loneliness, or depression, is rich and quite consistent. For an overview, DeNeve and Cooper (1998) present a meta-analysis of 137 personality traits and subjective well-being, and for more recent work, Steel et al. (2008) present a starting point.

Fagley (2018) reports that the Big Five account for 38% of variance in positive affect, and 43% of variance in negative affect. Three of the Big Five personality traits are considered to be positively associated with facets of well-being. The three are: openness to experience (e.g., Chen, 2008; Gonzâlez-Gutiérrez et al., 2005; Özgüven & Mucan, 2013; Steel et al., 2008), conscientiousness (e.g., Grant et al. 2009; Hayes & Joseph, 2003; Steel et al., 2008), and extraversion (e.g., Correa et al., 2010; Schimmack et al., 2004; Steel et al., 2008; Sun et al., 2017). Prior work also consistently shows that those who score high on neuroticism tend to have lower satisfaction with life or well-being (e.g., Chen 2008; Correa et al., 2010; DeNeve & Cooper, 1998; Hayes & Joseph, 2003; Schimmack et al., 2004; Steel et al., 2008; Sun et al., 2018).

Literature on the fifth personality trait, agreeableness, is not quite as clear. Chen (2008) concluded that those high on agreeableness would have lower well-being. However, Whaite and colleagues (2018) argued that agreeableness is significantly associated with lower odds of social isolation, a result that stands in contrast to Chen's (2008) conclusion. Özgüven and Mucan (2013) and

Schimmack et al. (2004) did not find significant results for agreeableness. In their meta-analysis, DeNeve and Cooper (1998) found a weak (r = .17, p. 209) positive correlation with subjective well-being based on prior literature. Steel et al.'s (2008) meta-analysis showed weak relationships between agreeableness and life satisfaction, positive affect, and negative affect (negatively correlated).

Predictor Variables in Well-Being

Despite the large amount of work done on social media or internet-related technology use, Big Five personality, and well-being, the pool of articles examining all three variables in relation to each other is comparatively small. Due to a long-standing tradition in the social sciences to emphasize significant results in published research over non-significant findings, it is unclear whether this work has not been conducted, or whether mostly non-significant findings resulted when it was attempted. The comparatively small body of significant results reported has, so far, not yielded clear trends or patterns that could be formulated into a theoretical lens on the triad of relationships. Therefore, any research reporting significant findings on this triad, and not just pairs of relationships, contributes to theory building as it sheds additional light on three core variables that seem logically and intuitively connected, and whose relationships to each other are clearly quite complex.

In 2010, Correa et al. examined the three constructs, using personality as predictor and social media use as outcome variable, with life satisfaction as control variable. They found that both males and females who were extraverted or open to experiences showed greater social media use. Males with lower neuroticism scores were more regular social media users. Similarly, Özgüven and Mucan (2013) found that conscientiousness, openness to experience, and life satisfaction predicted social media use. Stead and Bibby (2017) found that conscientiousness, extraversion, emotional stability, and agreeableness predicted well-being, with problematic internet use acting as a (negative) moderator. Similarly, Lin et al. (2016) showed that certain types of personality traits led to higher Facebook use, which then led to more positive psychological outcomes. Gerson et al. (2016) and Yang (2016) took yet again a different approach, using personality as a moderator between social media use and well-being. As these authors did not use the Big Five personality measure, comparable details are not provided.

The majority of this research uses personality as independent variable, which is in line with defining personality as a (more) stable trait. The literature shows that social media use and well-being influence each other. Presumably, overall well-being is a greater life

goal, most of the time, than social media use in itself, thereby directing people's behavior based on their personality.

H2: Personality will be a stronger predictor of well-being than social media use.

Methods

Procedures

Participants were recruited from large lecture courses at a Southeastern public university in the United States. They received either course credit or extra credit for completing the study. After agreeing to an informed consent statement, subjects accessed the online questionnaire containing measures on social media use, personality, well-being, and demographics. When participants completed less than 50% of the questionnaire or failed one of multiple response checks, their data were not retained for the study.

Questionnaire Components

The questionnaire consisted of four conceptual blocks: social media use, personality, well-being, and demographics. Three measurements were used to measure social media use: the Social Media Engagement Scale, a revised Social Media Intensity (SMI) Scale, and time spent on social media. The Social Media Engagement Scale by Przybylski et al. (2013, p. 1844) is a 5-item measure asking about social media use throughout the day. Answer options are on an 8-point Likert-type scale (1 = "not one day last week" to 8 = "every day last week"). The second measure was based on Ellison et al.'s (2007) Social Media Intensity (SMI) Scale, which originally has seven items. In 2013, Salehan and Negahban successfully adapted this scale to "social networks," reducing it to five items in the process. For the study at hand, Salehan and Negahban's version was used but any reference to "social networks" or "networking sites" was replaced by the words "social media" or "social media sites." A 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree) was used for the revised SMI scale. Finally, based on Koban et al. (2018), participants were also asked to estimate how much time they spend on social media, "on a typical *week*-day" and "on a typical *weekend*-day." Participants entered the amount of time in hours for each of these questions, providing a continuous measure with a possible range of 1–24 for each of the two questions.

In order to simplify interpretation of analyses, and due to the high correlations between some measures, the four separate social media use measures were reduced to two variables. After converting to z-scores, the SMI and SME scales were averaged to create a new "social media engagement & intensity (SMEI)" variable. The

weekday and weekend time measures were averaged into a new "social media time" (SMT) variable. Unless otherwise specified, all following analyses used these combined measures.

To measure personality, the 44-item Big Five Inventory (John & Srivastava, 1999) was used. This version was chosen due to the reported high reliability by both the original authors and other researchers (e.g., Xu et al., 2016), and because it has fewer items than the original version.

To measure well-being, three well-regarded scales were used. First, the 20-item CES-Depression Scale (Radloff, 1977) was used, arranged on a five-point Likert-type scale ranging from 1 "rarely or none of the time (less than 1 day)" to 5 "most or all of the time (5–7 days)." Second, the 20-item Positive Affect Negative Affect Scale by Watson et al. (1988) was used with a "felt this way during the past week" instruction. Likert-type answer options ranged from 1 "very slightly or not at all" to 5 "extremely." Third, the 5-item Satisfaction with Life Scale by Diener et al. (1985) was used with a 5-point scale ranging from 1 "strongly disagree" to 5 "strongly agree" for consistency with the other measures. The last group of questionnaire questions consisted of demographic questions such as age, gender, and race/ethnicity.

Well-being variables were combined to facilitate data interpretation. Satisfaction with life and positive affect were averaged into "positive well-being (PWB)" and depression and negative affect were averaged into "negative well-being (NWB)." Because depression and negative affect were arranged on different answer scales, z-scores were used. The use of two indexed well-being measures with different orientations (positive and negative) acknowledges that these can occur simultaneously, be affected differently by personality traits, and respond differently to social media use. An overall well-being measure indexing all measures may "average out" important nuances. Analyzing each measure on its own allows for conclusions focused on each individual measure, and only conceptually and abstractly about well-being. By indexing two measures each into two separate well-being variables, contradictory or null findings in prior research may be teased apart, leading to more nuanced insight.

Results

All scales used showed acceptable reliability defined as Cronbach's alpha loadings of .70 or higher. Actual alphas ranged from .74 to .88 (see Table 1).

Table 1. Cronbach's Alpha reliability scores

Big Five Inventory (.838)
Extraversion (.849), Agreeableness (.741), Conscientiousness (.782), Neuroticism (.808),
Openness (.788)
CES-Depression Scale (.792)
Positive Affect Negative Affect Scale (PANAS)
Positive Affect (.869), Negative Affect (.887)
Satisfaction with Life Scale (.774)
Social Media Engagement Scale[a] (.823)
Social Media Intensity Scale[a] (.801)
Social Media Time[a] (one item-measure, Cronbach's alpha not applicable)

Note. [a] indicates measure was standardized (z-score) for analysis.

Demographics

The total sample of usable questionnaires consisted of N = 304 subjects. Of those, 69.7% (n = 212) were female and 29.3% (n = 89) were male, and 1% (n = 3) chose one of multiple other answer options offered on the gender question. The average age of participants was 20.29 (SD = 1.67), ranging from 18 to 34. The sample was predominantly white (63.2%), with 14.2% identifying as Hispanic, 9.3% as Latino/Latina, 7.3% as Black, and 6% as multi-racial.

Social Media Use

On average, respondents reported using social media for 3.69 hours per weekday (SD = 3.07) with a range from zero to 20 hours. For weekends, respondents reported using social media for an average of 4.13 hours per weekend day (SD = 3.24), with a range from zero to 24 hours. Respondents showed a mean score of 3.82 (SD = 1.01) on the social media intensity (SMI) scale, and a mean score of 4.69 (SD = 1.85; possible range 1–8) on the social media engagement (SME) scale.

Personality and Well-Being

Overall, few participants scored on the extreme ends of any of the personality sub-scales. On average, participants also indicated slightly above average positive affect, low negative affect, and low levels of depression. Table 2 shows some descriptive statistics for these variables.

Table 2. Descriptive data for the Big Five, PANAS, and depression scales

Variable	*M* (SD)	Mode	Min	Max
Openness	3.79 (.58)	4.00	1.70	5.00
Conscientiousness	3.59 (.60)	3.22	2.00	5.00
Extraversion	3.56 (.74)	3.88	1.25	5.00
Agreeableness	3.85 (.57)	3.89	2.11	5.00
Neuroticism	3.07 (.75)	3.13	1.25	4.63
Positive affect	3.51 (.77)	3.10	1.00	4.00
Negative affect	2.32 (.76)	1.70	1.00	4.40
Depression	2.13 (.39)	1.85	1.00	3.30

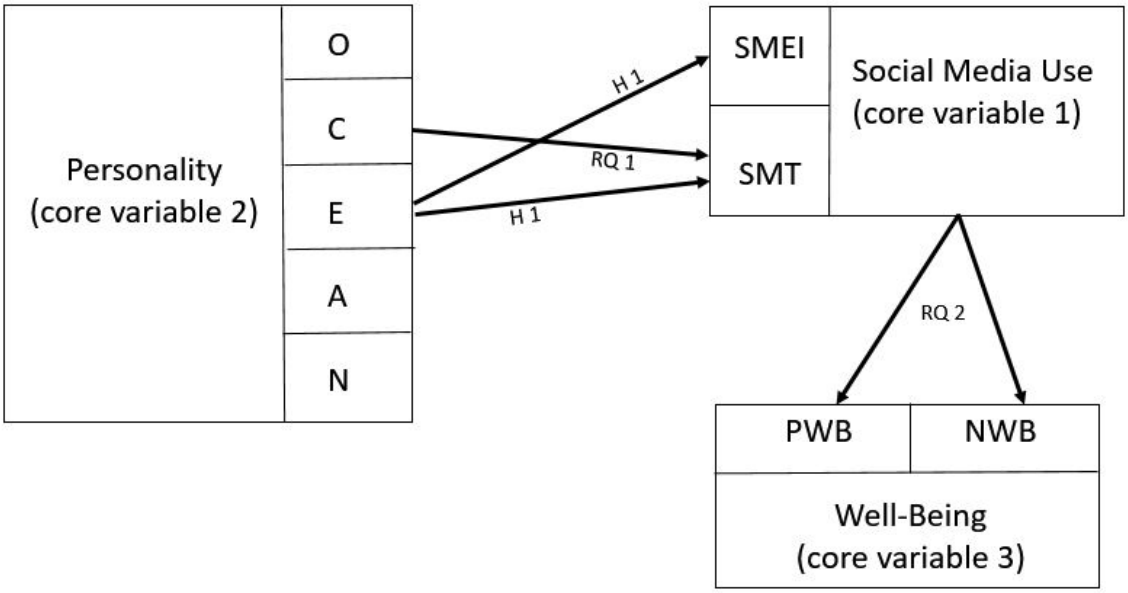
Note: N = 304 for all measures

Research Question 1 & Hypothesis 1

Research Question 1 inquired about the relationship between personality and social media use. I expected a positive relationship between extraversion and openness with regard to SMEI and SMT (H1). A simple linear regression analysis shows that extraversion predicts SMEI, $F(1,422) = 18.27$, $p<.001$ ($R^2 = .042$, beta = .241), and SMT, $F(1,417) = 9.98$, $p = .002$ ($R^2 = .023$, beta = .651), partially supporting Hypothesis 1. There was no significant correlation between SMEI or SMT and openness.

The literature was not consistent with regard to neuroticism, agreeableness, and conscientiousness and the relationship one might expect between these traits and social media use (RQ1). Regression analyses showed no significant relationships between agreeableness or neuroticism and SMEI or SMT. Regression results were also non-significant for conscientiousness and SMEI but showed a significant linear regression for conscientiousness and SMT, $F(4,417) = 7.26$, $p = .007$ ($R^2 = .017$, beta = -.702). Figure 1 visualizes the significant relationships.

Figure 1. Significant findings of hypothesis 1 and research questions 1 & 2



Note. Significant at p<.05. O C E A N = openness, conscientiousness, extraversion, agreeableness, neuroticism; SMEI=social media engagement & involvement; SMT=social media time; PWB=positive well-being; NWB=negative well-being

Research Question 2

Research Question 2 inquired into the relationship between social media use and well-being. Two analyses were conducted, one for each type of well-being (see Figure 1 for significant results). Social media use significantly predicted both positive well-being with $F(1,422) = 7.54$, $p = .006$ ($R^2 = .018$, adj $R^2 = .015$, beta = .120), and negative well-being with $F(1,422) = 16.65$, $p<.001$ ($R^2 = .038$, adj $R^2 = .036$, beta = .198).

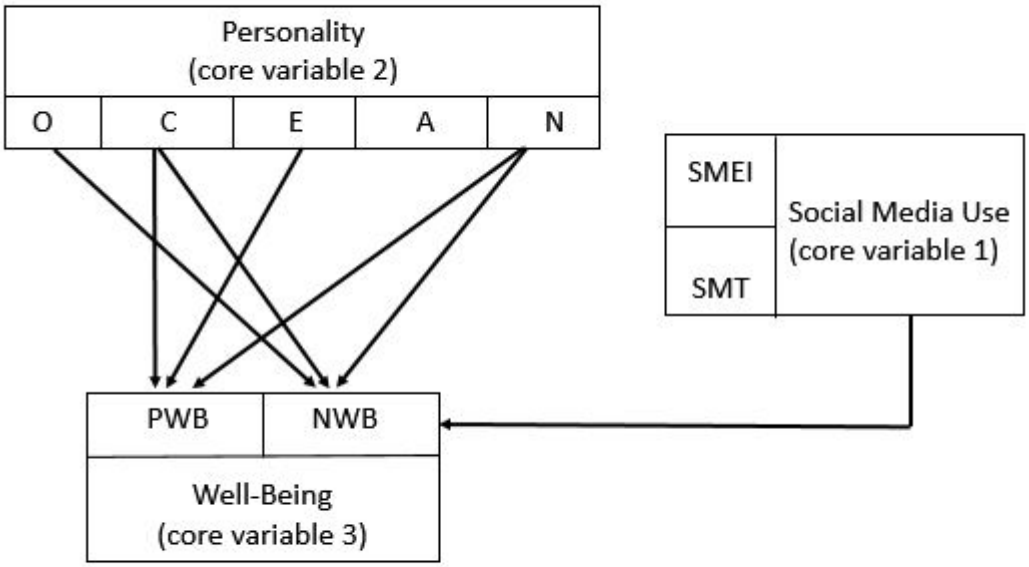
Hypothesis 2

Hypothesis 2 indicated that personality would likely be the stronger predictor of well-being compared to social media use. This hypothesis was supported except for openness.

Using stepwise regression analysis, the contribution each of the predictor variables (five personality traits, SMEI, and SMT) made to explaining the variance in the dependent variables (PWB, NWB) was examined (see Figure 2). When entering all predictor variables together to predict PWB, the model explained 22.8% of variance and significantly predicted PWB, $F(3,292) = 28.76$, $p<.001$. Three variables contributed to the final model, neuroticism (B = -.209, $p<.001$, R^2 change = .130); conscientiousness (B = .208, $p<.001$, R^2 change = .058); and extraversion (B = .178, $p<.001$, R^2 change = .039).

When entering all variables to predict NWB, the final model explained 46.7% of variance in NWB, F(4,291) = 63.85, p<.001. The four variables that contributed to the final model were neuroticism (B = .530, SE = .051, p<.001, R^2 change = .412); conscientiousness (B = -.150, p<.001, R^2 change = .031); openness (B = .111, p = .004, R^2 change = .014); and SMEI (B = .108, p<.001, R^2 change = .010). Based on these results, it would seem that some of the personality variables predict well-being more strongly than do social media use variables.

Figure 2. Significant findings of hypothesis 2; all variables entered simultaneously



Note. Significant at p<.05. O C E A N = openness, conscientiousness, extraversion, agreeableness, neuroticism; SMEI=social media engagement & involvement; SMT=social media time; PWB=positive well-being; NWB=negative well-being

To investigate each personality trait more closely, the analyses were re-run, but this time with only one Big Five trait at a time, as well as SMEI and SMT. Results are visualized in Figure 3. Openness: Results showed that SMEI (B = .121, SE = .061) predicted PWB, F(1,294) = 3.94, p = .048, R^2 = .013, while the other variables were excluded. SMEI (B = .145, SE = .062, p = .020, R^2 change = .016) predicted NWB more strongly than openness (B = .111, SE = .051, p = .030, R^2 change = .016), F(2,293) = 4.88, p = .008, R^2 = .032.

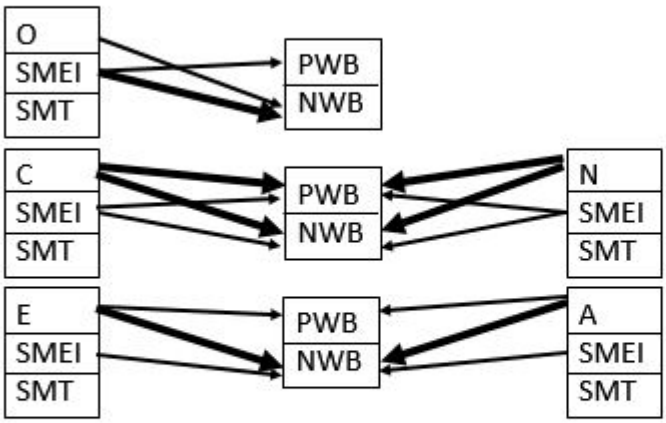
Conscientiousness (B = .277, SE = .047, p<.001, R^2 change = .103) predicted PWB more strongly than SMEI (B = 1.21, SE = .058, p = .037, R^2 change = .013), F(2,293) = 19.33, p<.001, R^2 = .117. Likewise, conscientiousness (B = -.288, SE = .048, p<.001, R^2 change = .106) predicted NWB more strongly than SMEI (B = .139, SE = .059, p = .020, R^2 change = .016), F(2,293) = 20.46, p<.001, R^2 = .123. SMT was excluded from the model both times.

Only extraversion (B = .260, SE = .048) predicted PWB, F(1,294) = 29.69, p<.001, R^2 = .092, with both of the social media variables being excluded. Extraversion (B = -.149, SE = .051, p = .004, R^2 change = .020) also predicted NWB more strongly than SMEI (B = .171, SE = .063, p = .007, R^2 change = .024), F(2,293) = 6.79, p = .001, R^2 = .044, with SMT not contributing to the model fit.

A similar trend emerged for agreeableness (B = .167, SE = .050), which predicted PWB, F(1,294) = 11.39, p = .001, R^2 = .037. Agreeableness (B = -.180, SE = .051, p<.001, R^2 change = .035) also predicted NWB more strongly than SMEI (B = .159, SE = .062, p = .010, R^2 change = .022), F(2,293) = 8.84, p<.001, R^2 = .057). SMT was excluded from the model again.

Finally, neuroticism (B = -.318, SE = .047, p<.001, R^2 change = .130) also predicted PWB more strongly than SMEI (B = .143, SE = .057, p = .012, R^2 change = .019), F(2,293) = 25.63, p<.001, R^2 = .149. Likewise, neuroticism (B = .564, SE = .039, p<.001, R^2 change = .412) predicted NWB more strongly than SMEI (B = .099, SE = .048, p = .040, R^2 change = .008), F(2,293) = 106.36, p<.001, R^2 = .421, with SMT not contributing to either model.

Figure 3. Significant findings of hypothesis 2; analysis by one personality trait at a time



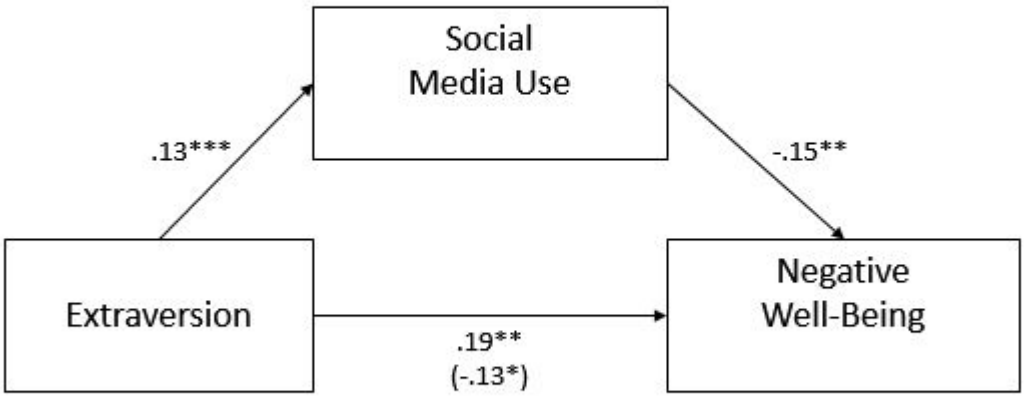
Note. Significant at p<.05. Thicker line indicates stronger predictor. O C E A N = openness, conscientiousness, extraversion, agreeableness, neuroticism; SMEI=social media engagement & involvement; SMT=social media time; PWB=positive well-being; NWB=negative well-being

To summarize these last results, when entering each personality trait separately, PWB was predicted by SMEI (but not openness), conscientiousness and SMEI, extraversion (but not SMEI), agreeableness (but not SMEI), and neuroticism and SMEI. Social media time never entered the models. Negative well-being was predicted by SMEI and openness, conscientiousness and SMEI, extraversion and SMEI, agreeableness and SMEI, and neuroticism

and SMEI. Again, social media time did not enter the models. The personality trait to note here is openness, as it did not predict PWB when combined with SMEI and predicted NWB less strongly than SMEI.

To investigate possible mediation, Hayes' PROCESS macro for SPSS was used. The Big Five traits were used as causal variables, PWB and NWB as outcomes, and SMU as mediator. There was no significant indirect effect of the Big Five on PWB through SMU. Only one significant indirect effect (ab) was found for NWB, indicating probable partial mediation, namely for extraversion through SMU, ab = -.026, 95% CI [.004, .057]. Based on Kenny (2018), this should be classified as a small effect in mediation analysis. The mediator (SMU) accounts for roughly one fifth of the total effect, P_M = .20. Based on the MedPower app, power for the indirect effect is .590. It should be noted that in this mediation, the total effect (c = -.13) is opposite in sign to the direct effect (c' = .19), and the direct effect is larger than the total effect (see Figure 4).

Figure 4. Mediation of extraversion on negative well-being through social media use



Note. * p<.05; ** p<.01; *** p<.001

Discussion

Interpretation

The purpose of this study was to investigate the relationships between social media use, personality, and well-being. Specifically, the study investigated social media use by measuring social media engagement, intensity, and time. It measured personality based on the Big Five personality traits. Finally, the study used positive affect and satisfaction with life to measure positive well-being, and negative affect and depression to assess negative well-being.

Research Question 1, inquiring into the relationship between personality and social media use, found that more extraverted individuals show more social media engagement and intensity, as

well as more social media time. This is consistent with some of the prior literature (e.g., Correa et al., 2010). Most likely, social media offer additional opportunities for these individuals to engage with others. Results also showed that people scoring higher on conscientiousness spent less time on social media, a result more consistent with older research on this relationship (e.g., Landers & Lounsbury, 2006) than more recent findings (e.g., Mark & Ganzback, 2014). Most likely, conscientious people in this sample define social media use as entertainment and limit their use according to other demands on their time. Results for the other personality traits were not significant with regard to social media use. Intuitively, one may expect those who are more open toward change and experience to also spend more time on social media, and some prior research supports such notions (e.g., Kalmus et al., 2011; Özgüven & Mucan, 2013). However, results from this sample did not support such an interpretation. Results also did not support findings of a negative relationship between conscientiousness and social media or technology use (Parida et al., 2016). Possibly, the sample was too homogenous, as it consisted of undergraduate students from one US southeastern university. It is also possible that the openness trait relates less to basic use measures and would instead show significant results on measures that assess which or how many types of social media people are using.

Research question 2 investigated the relationship between social media use and well-being. Prior research found contradictory results, claiming both that social media use could increase life satisfaction (Özgüven & Mucan, 2013) as well as decrease life satisfaction (Przybylski et al., 2013). Both prior findings were supported by this study, probably due to the use of both negative well-being and positive well-being measures. An increase in social media engagement and intensity (SMEI) predicted both positive and negative well-being. Variance explained was low for these results. Clearly, additional variables are pertinent, contributing to people's well-being and social media use, with either variable making up only one small component in the other's overall construct. Nonetheless, these results support the use of two well-being measures with different orientations as opposed to one overall measure. Results therefore contribute to theory-building efforts in this area of research. They help explain prior findings that seemed contradictory but may simply have resulted from using an overall well-being measure as opposed to separating well-being into two independent components, positive and negative. An overall measure may cause nullification of concrete measurement directionality, leading to non-significant results or results that vary from study to study, depending on other factors included in the study. Future researchers are encouraged to explore the concepts of positive well-being and negative well-being

separately to help build a more refined understanding of the relationships, potentially allowing patterns to emerge more clearly until an underlying theory emerges.

Hypothesis 2 predicted that personality would explain more variance in positive and negative well-being than social media use. Results showed that conscientiousness, extraversion, agreeableness, and neuroticism all predicted PWB stronger than did SMEI, partially supporting Hypothesis 2. However, openness did not predict PWB significantly and was "out-performed" by SMEI when predicting NWB. Mediation analysis indicated that social media use acts as a suppressor variable for extraversion's effect on NWB when entered as mediator. Thus, personality remains a better predictor than social media use overall, though more research may be needed with specific focus on openness, social media use, and well-being.

These results may also help explain the relative dearth of literature on the triad of relationships. If social media use acts as a suppressor variable in mediation analysis, it may well have led to non-significant results when an overall well-being measure was used in prior studies. Therefore, the combination of approaches used here, the separation of well-being into positive well-being and negative well-being along with a triadic analysis as opposed to looking at pairs, provides researchers with a springboard for additional inquiry into these relationships. Future studies following this approach may well be able to show nuanced relationships between specific personality traits and one or both types of subjective well-being, and how these are mediated by the use of social media as a whole, or specific types of social media platforms or motivations for social media use. Building on this study's approach, future research may find additional significant relationships that aid in formulating a theoretical explanation of the triadic relationship of these variables.

Implications

Overall, findings add to the literature as results differentiate between personality types and social media use with regard to their usefulness in predicting two types of subjective well-being. According to these results, people who may be described as more affable (those high on extraversion and/or agreeableness) can be expected to score highly on positive well-being measures. Their social media use does not contribute to this in any way. However, their social media use contributes to their negative well-being. This runs counter to intuition, as we may expect more affable people to add to their well-being via the social interactions they have online. These results indicate that maybe instead, social media use affects affable people negatively. Chan (2014) found that Facebook use suppressed extraverts' empathic social skills. This relationship

between extraversion, negative well-being, and specific social media use warrants more investigation in a time when connecting on social media is "normal" and even socially encouraged and thought to increase people's well-being but may well have the opposite effect.

For people who may be described as planners (Orr, 2012; those high on conscientiousness and/or neuroticism), personality seems to outweigh social media use in predicting both positive and negative well-being. Thus, if the goal is to improve well-being, people with high conscientiousness and/or neuroticism may want to look to other tools, not to social media, in order to achieve that goal. It should be noted here that while the variance explained was overall fairly low for the relationships described, neuroticism explained 41% of variance in negative well-being for this study's sample, and only 13% of variance in positive well-being. However, the respective values for social media use were only 2.7% and 2%. Thus, it would seem that social media use barely impacts well-being for those who are high on neuroticism because their personality predicts well-being so strongly, especially negative well-being. While social media use does not seem to help neurotics much, it also does not seem to do a lot of harm compared to their predisposition despite Chan's (2014) finding that only low Facebook use can prevent empathic social skills from being suppressed for neurotics.

Finally, for people who may be described as more curious (those high on openness to experience), social media use is a stronger predictor of well-being than personality. More curious people seem to derive both positive and negative well-being from social media use. People high on openness may find that social media use causes depression or other forms of negative well-being. Future research could possibly determine which specific content or types of social media cause the increase in people's negative well-being. People may then be advised to steer away from such content or social media tools.

Future Research

Results from this study provide good starting points for future researchers who are encouraged to verify them with less homogenous samples. Future research may also wish to explore deeper into social media use to investigate whether there is specific content or types of social media tools that increase negative well-being for people high on extraversion, agreeableness, or openness to experience, or pairs of these traits. Finally, future research should continue investigating subjective well-being as two separate, indexed variables with different directions (positive and negative), as this methodological approach has led to novel results as presented here. Such results could provide tangible advice for the use in health

education, parenting, and the development of new social media tools.

Limitations

The main limitation of this study results from its convenience sample. Participants were recruited from the student population of one university. Thus, results should not be generalized across all ages, geographic locations, and education levels. Instead, results should be taken as one point of information that could potentially be replicated with different samples, eventually leading to identifying a trend or generalization.

In addition, data presented here were collected before the COVID-19 pandemic. As such, the data cannot tell us about social media use, well-being, and personality during or after a pandemic, an event that is likely to have affected the first two of these variables and has possibly emphasized personality traits. However, collected just before the onset of the pandemic, these results may allow cautious, indirect comparison to data collected after the beginning of the pandemic, adding to our knowledge of pandemic effects on these variables.

Conclusion

In conclusion, this study extends current research by investigating the relationship between three variables: social media use, personality traits, and well-being. This study also contributes to current research by presenting more detailed results on specific personality traits and people's social media use, and which of these variables explains more variance in two types of well-being with different orientations (positive and negative). Results differ by personality trait and do not always conform to off-the-cuff intuition. While questions remain, results from this study have immediate applicability for social media use and/or health campaigns, allowing for more targeted outreach based on dominant personality traits.

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