Openness to Experience: A Predictor of Technology Use at Any Age?

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OPENNESS TO EXPERIENCE: A PREDICTOR OF TECHNOLOGY USE AT ANY AGE?

by

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ABSTRACT

Technology is an integral part of both modern culture and day-to-day communication. Older adults' relationships with technology is completely different than younger adults' because of the way they have learned to incorporate it into their lives. Past research has shown that certain personality traits can predict technology use in younger adults. The current research hopes to take that finding and see if it applies to older adults, too. Four hypotheses were generated. Participants took a survey that consisted of five different scales and measures. Participants also were asked to answer demographic questions. Independent-sample t-tests and bivariate correlations were run on the data. Results showed that general technology use was not significantly correlated to a participant's age. There were significant correlations between the two age groups and psychological well-being, feelings of attachment to peers, technology use subscales and sensation seeking subscales. Future studies should examine the possible relationship of technology use subscales amongst the older population and their attitudes towards technology.

Keywords: personality, technology use, psychological well-being, attachment, sensation seeking

To my mom, Staci, for watching over me in Heaven.
To my dad, Jack, for being my biggest supporter.
To my sister, Alex, for always making me laugh.
I love you all.

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INTRODUCTION

In today's ever-changing society, technology is an integral part of both modern culture and day-to-day communication. Since the turn of the twenty-first century, there has been advancement after advancement in modern technology that has helped create and reimagine the world we live in today. It is well known that the younger generations of the population tend to be more involved with the latest gadget or gizmo, but what about the rest of society? In the United States today, 14% of the total population is over the age of 65. That relatively small percentage equates to approximately 46.2 million people categorized as elderly (United States Census Bureau, 2016). In fact, by 2060, it is projected that approximately 98.2 million U.S. citizens will be over the age of 65 (United States Census Bureau, 2016). With more of the population getting older every day, there still seems to be an age gap in overall technology usage. There seems to be a focus on people younger than 50 when it comes to newer technology and an even greater emphasis on those in the younger age cohorts (i.e., 15-25). For instance, as of 2016, Instagram had more than 600 million active users, and only 8% of those users are over the age of 65, while at the same time, 59% of Instagram users are between the ages of 18 to 29 (Madden, 2010). Does the older generation just not like Instagram or perceived "younger" forms of technology? Or is there another variable that is impacting usage and creating this intergenerational gap?

One possible answer to this question is the motivation behind technology use. It is well known that everyone uses technology in some shape or form, but what differentiates usage are the motivations behind it. Sheth et al. (1991) found five categories of values that influence our behaviors and motivations: Functional value, social value, emotional value, epistemic value, and

conditional value. Hallikainen (2015) took these values and applied them to social media platforms. According to Hallikainen, functional value is the capability of social media platforms to provide means to achieve one's goals. Social value is defined as maintaining one's social image through using social media platforms. Emotional value is defined as the emotions aroused when using social media. Epistemic value is defined as the capability of social media to provide knowledge. Conditional value is defined as using social media on certain situations (for one's birthday or wedding). As for the elderly, it has been found that their primary reason for having and engaging in various forms of social media is so that they can stay in touch with their family (Strom & Strom, 2015). Using Hallikainen's definitions, it suggests that the elderly use different platforms for the emotional and epistemic values. A majority of older adults did not grow up with access to modern day tools that many younger adults have grown up with such as the internet. Due to this, they are not used to using it as a platform for something more than staying in touch with family. Unlike older adults, research suggests that both younger and middle-aged adults use networks to simply stay in contact with friends (Strom & Strom, 2015). Though the primary reason for use is to stay in contact with other individuals, it is interesting to see how age differences impact who people want to stay connected with. The internet only surfaced in 1983, thirty years after someone who is 65 years old in 2018, was born. Older adult's relationships with technology are completely different compared to someone younger because of the way they have learned to incorporate it into their lives.

Overall rates of technology use (including phones, computers, tablets, etc.) have drastically increased in the last two decades. For instance, in 2010, only 3% of adults in the United States used some form of a tablet computer. As of January 2018, that number rose to over

half (53%) of U.S. adults using a tablet computer in only 8 years (Smith, 2017). Technology use continues to change every year with the introduction of different and upgraded versions of devices. More and more people continue to rely significantly on technology, despite their age or reason for use. Anderson and Perrin (2017) found that certain groups of seniors who are highly educated report owning and using technology at rates very similar to their younger counterparts. There has been an ongoing assumption that older adults do not use technology and that they try not to adopt it into their everyday lives. This has not been supported by research. Even though it is well-known that seniors use technology less than their counterparts, in the past few years, they have been more digitally and socially connected than before (Anderson & Perrin, 2017). Society continues to move forward into the future, which brings along new advancements in technology. Just like the rest of the population, seniors are also moving towards more digitally connected lives.

An aspect that has been found to influence technology use that I am most interested in is personality. "Personality refers to a stable psychological characteristic that predicts a wide range of attitudes and behaviors" (Correa et at., 2013). One of the more well-known personality psychology findings is the "Big Five Personality Traits," which introduced the idea of there being five main personality factors that everyone in the world has. Similar to most personality psychology research, the theory aims to look at what differentiates us from one another, but at the same time tries to identify the many similarities as well. Findings from the John et al.'s research suggest that every person has a combination of different levels of the five traits, which creates their unique personality: Neuroticism, agreeableness, openness, extroversion, and conscientiousness. Each trait has an opposite counterpart that helps define personality. For

instance, extroversion has the opposite trait introversion. When measured through the Big Five model, each variable summarizes specific details of personality, like sociability, which in itself contains more specific traits such as how talkative or outgoing an individual might be (Correa, Hinsley, & de Zúñiga, 2010).

Neuroticism is an individual's tendency to experience unpleasant emotions and expect bad things to happen to them (Özgüven & Mucan, 2013). When an individual scores high on the neuroticism scale, it has been found to be associated with higher levels of anxiety, depression, and overall emotional instability (Liu & Campbell, 2017). Additionally, research has shown that more neurotic individuals are more likely to post items on a blog or other social media outlets. (Liu & Campbell, 2017). People who score high in neuroticism also seem to prefer computer-mediated forms of communication versus in-person interaction (Correa, Hinsley, & de Zúñiga, 2010).

Openness is the appreciation of alternative perspectives, intellectual curiosity, and the desire of different artistic pleasures (Özgüven & Mucan, 2013). Additionally, when someone is considered to be more open, they have a greater ability to find, understand, and incorporate abstract ideas and patterns into their everyday lives (Liu & Campbell, 2017). In previous research, openness has shown to be a reliable predictor of different social networking website use. Correa et al. (2013) discovered that those who were more open to new experiences tended to use social media sites more frequently.

Agreeableness is the tendency to be reliable, sympathetic, and cooperative (Özgüven & Mucan, 2013). Someone who scores high in agreeableness has an easier time fitting into different situations and is a dependable worker. Agreeableness has been found to reflect one's

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interpersonal orientation towards others, including emotions such as sympathy, courteousness, interpersonal flexibility, kindness, trust and forgiveness (Liu & Campbell, 2017). Research has found that agreeable individuals have an easier, less stressful life experience.

Extroversion is an individual's tendency to express themselves socially in a very outgoing manner (Özgüven & Mucan, 2013). Extroversion has been found to be associated with activity, social gregariousness, optimism, drive, and talkativeness. Extroversion is also associated with reward-seeking and behavioral exploration (Liu & Campbell, 2017). Those who are more extroverted are enthusiastic and easily distracted. Extroversion has been found to be associated with charisma, confidence, and someone who is seemingly full of life.

Conscientiousness is a tendency to plan ahead and be diligent (Özgüven & Mucan, 2013). Conscientiousness persons tend to follow the rules, be industrious, and work hard for their long-term goals in life (Liu & Campbell, 2017). Such persons are careful, forward thinkers, and vigilant in all aspects of their lives. They also are known to be organized and efficient in tasks or jobs they are required to complete. Conscientiousness has been shown to be able to predict one's success and has shown lower levels of addictive tendencies.

Out of all of the Big Five, I decided to focus this research on openness because it is the trait most associated with trying new things, in this case, new forms of communication through different technological devices. According to Ross et al. (2009) openness depicts a person who considers choosing different approaches in life. Prior research has looked at different personality traits and tried to discover if there was a possible correlation between a particular characteristic and how they interact with social media. Ross et al. analyzed extroversion, emotional stability, and openness and found many promising findings that I hope to also see in my research. Ross et

al. (2009) also found that openness was related to online computer-mediated communication and an individual's ability to visit different platforms of communication. Something to take into consideration with Ross et al.'s findings is the year their research was conducted. For instance, Facebook was created in 2004, and was open to all people over the age of 13 in 2006. When they conducted their research, Facebook was still relatively new, so the people who opted to create an account were most likely already high in openness to experience. The same can be said for Twitter, as it was also first made in 2006. Additionally, Ross et al. only looked at college-aged students with an average participant age of 21.69 years. For this research, the study will analyze college-aged students, but will also examine participants who are over the age of 65 to see if the findings are consistent no matter the age of the participant. Though prior research has shown that openness is negatively associated with age (Donnellan & Lucas, 2008), the current research is not trying to find a longitudinal correlation, rather it will look at separate college-aged adults who score high in openness, and different older adults (over 65) who also score high in openness. Personality has shown to impact the type of technology a person decides to use. Hughes et al. (2012) analyzed personality differences, using the Five Factor model, as well as researched why certain people use certain platforms. Results from their study revealed that different people use the same website or social media program for different purposes. In their study, they examined different social media websites including Facebook, Twitter, and other commonly used sites. The results indicated a differential relationship between the behaviors and personality differences between those who are on Facebook and Twitter (Hughes et al., 2012). Specifically, they discovered that individuals who use Facebook are more likely to be high in neuroticism, while those who use Twitter are more likely to be high in conscientiousness and openness to

experience. This finding has been found in other research including the work done by Correa et al. in 2013. One conclusion is that those who are more extroverted are more likely to use social media, while those who are more open are more likely to use it more frequently (Correa et al., 2013). What this finding suggests is that an open person with social media will use it more than someone who is extroverted. Both extroverted and open people will use social media, but people who are more open will use it more frequently.

Additional variables that are potentially interesting in the current research are psychological well-being and attachment. Research has shown that those who are more open tend to enjoy trying new things, in this case, new forms of communication through different technological devices. Part of the current research hopes to determine if those who are more open and use technology more, are also psychologically well and if they show strong attachment to their friends and family. All of the variables in this research are interrelated to some extent. As for technology use and feelings of attachment, in one study participants reported their frequency of use of technology, relationship qualities, and feelings of attachment. Frequency of communication using a phone and text messaging were positively correlated with relationship satisfaction, feelings of attachment, and intimacy (Morey et al., 2013). As for technology use and psychological well-being, in one study participants reported motivations for information and communication technology (ICT) and rated their psychological well-being. Researchers found that using more devices was associated with higher life satisfaction, lower loneliness, higher goal attainment, better subjective health, and fewer functional limitations (Sims et al., 2016). Though this particular finding revealed positive results, this is not always the case in research with technology use and psychological well-being. Other studies have found opposite results, with

negative associations. The Big Five traits and well-being are also related. In one study, participants took the Big Five, satisfaction with life scale (well-being), and a self-esteem assessment. Results showed that extraversion, neuroticism, agreeableness and conscientiousness were significantly correlated with life satisfaction. Openness to new experiences was not correlated with life satisfaction (Joshanloo & Afshari, 2009). In the current research, I hope to find opposite results in that psychological well-being is positively correlated with openness. The Big Five has also been shown to be positively correlated with feelings of attachment. In one study, researchers had participants take an attachment style measure (secure, anxious, avoidant) and the NEO personality inventory, which measures the Big Five traits. Results suggested that participants who had secure feelings of attachment were more open (Brennan & Shaver, 1992). Finally, the two variables, psychological well-being and feelings of attachment, have also been related to one another. In one study, results supported their hypothesis that perceived quality of attachment was significantly related to psychological well-being (Armsden & Greenberg, 1987). They also found that participants who expressed a greater satisfaction with help they had from peers experienced greater psychological well-being.

Psychological well-being is an important part of one's life that helps create balance and feelings of tranquility in an individual. According to Ryff and Keyes (1995), well-being is made up of six dimensions: Autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance. When someone has strong levels of autonomy, they are someone who is independent and able to resist social pressures. Being an autonomous person means that you have control over your actions. Environmental mastery is defined as having competence in managing external surroundings. Someone who feels that they have strong

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environmental mastery feels as if they can influence the events in their everyday lives. Personal growth is defined as a feeling of continued development and improvement in behavior over time. Personal growth is a continuum and it can take a while to feel as if any growth has been made, but it can enhance the quality of life for individuals. When individuals feel that they maintain positive relations with others, they are concerned about others and are capable of empathy. They are considerate of others and are less self-centered. Having a purpose is defined as having goals. Additionally, people feel as if there is meaning to their life. Lastly, self-acceptance is when individuals have positive attitudes about themselves. They are self-aware and understand both the good and the bad qualities that are a part of their identity. Having a healthy balance of each of the six dimensions creates overall feelings of psychological well-being.

Attachment is defined as a strong affectional bond of substantial intensity (Armsden & Greenberg, 1987). In their original study, Armsden and Greenberg researched both parent and peer attachment, by examining the differences and similarities between the two. Researchers have tried to analyze the correlation between feelings of negative or positive attachment. Having a strong feeling of attachment to a parent or a peer is positive for overall well-being. When someone has positive feelings of attachment, they feel a sense of security and feel understood. When someone has negative feelings of attachment, they experience many negative emotions such as anxiety, sadness, depression, and anger. Additionally, someone with negative perceptions of attachment might feel threatened by the loss or lack of positive feelings of attachment (Armsden & Greenberg, 1987).

The current study is important because research in the past has not looked at the older generation as much when studying personality traits and technology use. It has been found that

approximately 66% of adults over the age of 65 who have both bachelors and advanced degrees indicate that they own some sort of smartphone (Anderson & Perrin, 2017). As the sample is a group of seniors who are well educated, I believe that this finding will be even more drastic. LIFE participants are older adults (over the age of 50) who already went through schooling, many of whom went on to graduate level programs such as medical or law school. Additionally, there has not been research that has tried to find a possible correlation between technology use and feelings of psychological well-being or feelings of attachment.

The primary purpose of the current study is to understand the connection between personality and technology use and evaluate whether that connection can predict psychological well-being or attachment levels. The following four hypotheses were generated:

1. Participants who score higher in Openness to Experience will also report a higher frequency of general technology usage.

2. Participants who have high levels of Openness and a high-frequency level of technology usage will be found in both SONA and LIFE groups.

3. Participants who score high in Openness and report a high frequency of technology use will indicate a higher overall psychological well-being.

4. Participants who score high in Openness and report a high frequency of technology use will have higher levels of attachment to their peers.

METHOD

Participants

Two hundred forty participants took part in this study. All participants were over the age of 18. There were two groups of participants: College-aged students (age ranged from 18-29), and those who are in the Learning Institute for Elders (LIFE) (age ranged from 50-86). Participants were recruited from the University of Central Florida's Psychology Research System, SONA (http://ucf.sona-systems.com) and through the LIFE program. All participants recruited through SONA were awarded credit for their participation toward a course requirement. Participants recruited through LIFE were strictly volunteers. Of the participants who reported their gender, 22% were male, 77% were female, and one identified as other. When asked to select which racial groups best represented them, 83% identified as White, 5% identified as African American, 7% identified as Asian, 0.5% identified as Pacific Islander, and 10% identified as other.

Materials

Five-Factor Inventory Personality Test. Made up of 44 questions., this item follow a 5-point Likert scale from "Strongly Agree" to "Strongly Disagree". The Five Factor Inventory Personality Test has shown to be valid and reliable. Reliability tests were run on the measures (Cronbach's Alpha): 0.63 for Openness, 0.82 for Extroversion, 0.82 for Conscientiousness, 0.72 for Agreeableness, and 0.81 for Neuroticism. All of the items began with the phrase "I see myself as someone who . . ." This inventory is included in Appendix A. Items on this test include:

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I believe in the importance of art. (Openness)

I often feel blue. (Neuroticism)

I am always prepared. (Conscientiousness)

I have a good word for everyone. (Agreeableness)

I feel comfortable around people (Extroversion)

Media and Technology Usage and Attitudes Scale. Designed by Rosen et al. in 2013, this scale is made up of 44 items that follow a 10 point frequency scale and is comprised of 11 subscales: Smartphone Usage (9 items), General Social Media Usage (9 items), Internet Searching (4 items), E-Mailing (4 items), Media Sharing (4 items), Text Messaging (4 items), Video Gaming (3 items), Online Friendships (2 items), Facebook Friendships (2 items), Phone Calling (2 items), TV Viewing (2 items). It also includes a separate Attitudes subscale made up of 16 questions, which uses a 5-point Likert scale. This questionnaire is included in Appendix B. Items on this scale include:

(General social media usage subscale) Check Facebook at work or school.

(E-mailing subscale) Check your personal e-mail.

(Text messaging subscale) Send and receive text messages on a mobile phone.

(Phone calling subscale) Make and receive mobile phone calls.

(Smartphone usage subscale) Get directions or use GPS on a mobile phone.

(TV viewing subscale) Watch video clips on a TV set.

(Media sharing subscale) Watch TV shows, movies, etc. on a computer.

(Internet searching subscale) Search the Internet for images or photos on any device.

(Video gaming subscale) Play games on a computer, video game console or smartphone BY YOURSELF.

(Facebook friendships subscale) How many of your Facebook friends do you know in person?

(Online friendships subscale) How many people have you met online that you have never met in person?

Psychological Well-Being Questionnaire. The scale is made up of 42 questions and follows a Likert scale from "1" Strongly Disagree to "6" Strongly Agree. The scale measures six dimensions: Autonomy, environmental mastery, personal growth, positive relations, purpose in life, and self-acceptance. This questionnaire is included in Appendix C. Items on this test questionnaire:

I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people. (Autonomy)

In general, I feel I am in charge of the situation in which I live. (Environmental Mastery)

I am not interested in activities that will expand my horizons. (Personal Growth)

Most people see me as loving and affectionate. (Positive Relations)

I live life one day at a time and don't really think about the future. (Purpose in Life)

When I look at the story of my life, I am pleased with how things have turned out. (Self-acceptance)

Inventory to Parent and Peer Attachment. Participants only answered the peer part of this assessment. The measure asks participants about their attachment to their friends and is made up of 25 items. Reliability is high (.86) for peer attachment (Armsden & Greenberg, 1987).

This measure follows a 5-point Likert scale from "1" Never True to "5" Always True. This questionnaire is included in Appendix D. Items on this test include:

My friends encourage me to talk about my difficulties.

Sensation Seeking Scale. Designed by Zuckerman in 1979. Consists of 40 questions that measures participants' level of sensation seeking. Each question contains two choices and the participant selects the one that most intrigues them. There are four subscales: boredom susceptibility, disinhibition, experience seeking, and thrill seeking and adventure. This questionnaire is included in Appendix E. Items on this test include:

A. I like "wild" uninhibited parties

B. I prefer quiet parties with good conversation.

Demographic questionnaire. This questionnaire asks participants' background information and collects basic demographic information such as age or race. It also includes questions regarding the participant's current position in school (i.e., class standing), as well as other questions relating to their education status. This scale is included in Appendix F.

PROCEDURE

Participants were first informed that they were going to take part in an online research study regarding technology. Participants were able to complete the survey from any computer with internet access throughout the duration of the study. Participants were given a consent form that indicates they were aware of the general purpose of the research and were prompted to select "agree" before continuing. Participants went through the Five Factor Inventory Personality Test. Once completed, participants then answered the Media and Technology Usage and Attitudes Scale. Following that, participants answered the Psychological Well-Being scales along with the Inventory to Peer and Parent Attachment. Participants then answered the Sensation Seeking scale. Finally, the participants were directed to fill out a demographic questionnaire which asked specific questions about their education. The participants then were awarded credit for their participation in the study.

RESULTS

Two-hundred forty participants took part in the study, but only the data from 180 were used for analysis. Thirty-nine participants did not fully completing the study. Additionally, the data from three participants (ages 32, 38, and 40) were removed to better allow a clear separation of age groups. There also were 18 participants who had invalid data because of the amount of time it took them to complete the study. In the end, the current study had data from 40 participants from LIFE and 140 participants from SONA.

A bivariate correlation was conducted to examine the possible connection between general technology use (M=149.3, SD=35.9) and openness to experience (M=3.53,SD=0.54). To calculate participant's technology use scores, each of the 4 subscales were added up to generate an overall score for each participant. There was no significant correlation and hence, no support found for hypothesis one at this level (r = -.051, $p = .496$).

A bivariate correlation was split between SONA and LIFE to test hypothesis two. There was not a significant correlation between high openness to experience and high technology for the LIFE group (r = .017, $p = .918$) or for the SONA group (r = -.001, $p = .992$). Further examination was needed to understand each individual technology use subscale and how they differ between age groups.

A series of independent-samples t-test were conducted on the data to examine each of the four subscales of the technology use scale. Those high versus low in openness to experience showed significant differences in smartphone usage (t (178) = 9.54, $p < 0.001$), social media

usage (t(178) = 6.35, $p < 0.001$), text messaging (*t*(178) = 10.81,*p*< 0.001) and phone calling (*t*(178) = -1.99, *p*< 0.047).

A between-subjects ANOVA using openness to experience and tech use as independent variables was conducted to examine hypothesis three which assessed psychological well-being. Data revealed that the main effect for Openness was not significant (F(7,26)=1.89, *p*=.194). Data also revealed that the main effect for technology use was not significant (F(7,89)=1.91, *p*=.186). There was no significant main effect interaction between technology use and openness (F(7,47)= 2.23, p=.133). An additional between-subjects ANOVA using openness to experience and tech use as independent variables was conducted to examine hypothesis four, which assessed feelings of attachment. Data revealed that the main effect for openness was not significant (F(9,26)=1.51, *p*=.264). Data also revealed that the main effect for technology use was not significant (F(9,94)=1.33, *p*=.337). Additionally, there was not a significant main effect for technology use X openness (F(8,90=1.17,*p*=.428). An exploratory analysis was conducted on the possibility of high technology use predicting high sensation seeking. A bivariate correlation was conducted on the data and found a significant correlation between general sensation seeking and technology use (r = -.165, *p = .028*).

Additional data analyses were run to examine relationships between age and individual subscales from different measures. Independent-samples t-tests were conducted to compare the Big Five personality types in both SONA and LIFE age groups.Results are reported in Figure 1. There was a significant difference in the scores for agreeableness (*M*= 4.13, *SD*=0.55 (LIFE), *M*=3.82, *SD*=0.66 (SONA); *t* (178) = -2.79, *p* = 0.006), conscientiousness (*M*=4.13, *SD*= 0.60 (LIFE), *M*=3.69, *SD*=0.60 (SONA); *t*(178) = -4.08,*p*< 0.001), and neuroticism (*M*= 2.34,

SD=0.64 (LIFE), *M*=3.11, *SD*= 0.86 (SONA); *t*(178) = 5.22, *p*< 0.001). There was not a

significant difference in the scores for extraversion (*M*= 3.36, *SD*=0.75 (LIFE), *M*=3.17, *SD*=

0.84 (SONA); *t* (178) = -1.28, *p* =0.20) or in the scores for openness to experience (*M*= 3.63,

SD=0.54 (LIFE), *M*=3.50, *SD*= 0.54 (SONA); *t*(178) = -1.29, *p*= 0.199). These results suggest

that those in LIFE experience greater levels of agreeableness and conscientiousness, while those

in SONA were found to experience greater levels of neuroticism.
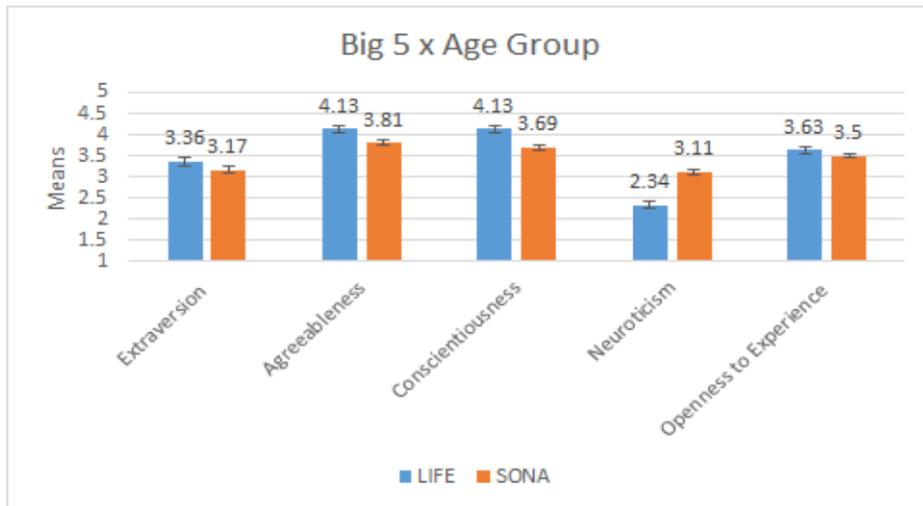
Figure 1: Big Five personality types analyzed between LIFE and SONA groups.

Additional independent-samples t-tests were conducted to analyze Sensation Seeking

subscales in both SONA and LIFE age groups. Results are reported in Figure 2. There was a

significant difference in the scores for boredom susceptibility (*M*= 15.20, *SD*=1.28 (LIFE),

M=14.56,*SD*=1.16 (SONA); *t* (178) = -2.97, *p* < 0.003), disinhibition (*M*=14.72,*SD*=1.30 (LIFE),

M=15.40, *SD*= 1.48 (SONA); *t* (178) = 2.62, *p* < 0.009), and thrill and adventure seeking

(*M*=15.67, *SD*= 1.02 (LIFE), *M*= 14.47, *SD*= 1.23 (SONA); *t*(178) = -5.64, *p*< 0.001). There was

not a significant difference in the scores for experience seeking (*M*=13.67, *SD*=1.36 (LIFE),

M=14.17, *SD*=1.54 (SONA); *t*(178) = 1.86,*p*= 0.064). These results suggest that those in SONA experience greater levels of disinhibition, while those in LIFE experience greater levels of boredom susceptibility and thrill and adventure seeking.
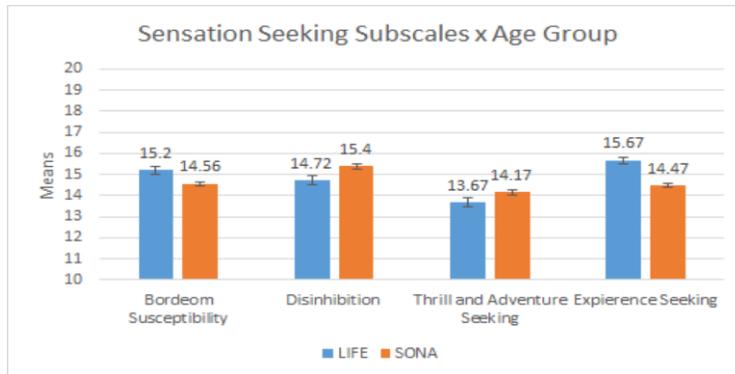
Figure 2: Sensation Seeking Subscales analyzed between LIFE and SONA groups.

An independent-samples t-test was run on the data to analyze participants attitudes to technology in both age groups. Results are reported in Figure 3. There was a significant difference between the LIFE (*M*= 55, *SD*= 7.42) and SONA (*M*= 57.67, *SD*= 7.35) groups in attitudes toward technology (t (173) =2.000, *p*= 0.047).

Figure 3: Attitudes Subscale analyzed between LIFE and SONA groups

DISCUSSION

The current study sought to examine four hypotheses regarding technology use and its relationship with age, personality factors, feelings of attachment, and psychological well-being. Of the four hypotheses that were initially analyzed, only one was found to be supported, which assessed psychological well-being. After looking into specific subscales, additional significant effects were found. There was a significant difference in the scores for agreeableness, conscien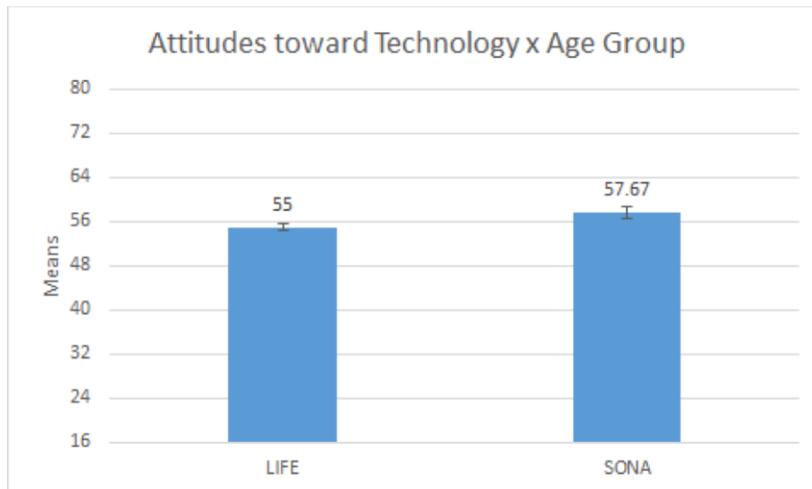tiousness, and neuroticism between participants in SONA and in LIFE. The data suggests that participants in LIFE were more agreeable and conscientious, while those in SONA were more neurotic. A surprising finding was that those in LIFE were found to be more open to experience than the participants in SONA.

There was a significant difference in the scores for boredom susceptibility, disinhibition, and thrill and adventure seeking in both age groups. The results suggest that those in LIFE were more likely to be bored, but those in LIFE also had greater levels of thrill and adventure seeking compared to the participants in SONA. This finding was surprising as many people assume that those adults who are older, are less likely to take risks. As for disinhibition, the data suggests that those who were in SONA were more disinhibited, implying that they are more impulsive. The data also showed that there was no significant difference in the scores for experience seeking for the two age groups.

One limitation from the current study was the lack of questions regarding newer technology and social media platforms. The majority of the measures analyzed older forms of technology. Since the platforms like Facebook or Twitter are older, many younger adults tend to

have them but not use them. This could account for the lower levels of use seen in the SONA group. Future studies should incorporate newer forms of technology including but not limited to: Snapchat, Instagram, Pinterest, smart homes (i.e., Alexa), and smart watches. For the Media and Technology Usage and Attitudes measure, there was a problem with one of the subscales it analyzed. In the instructions, it stated that there were four questions which measured texting. However, it seems to only list three that specifically measure texting. Missing one of the subscale questions changed the scoring for texting use and overall general technology use.

A possible limitation of the current study was the ratio of SONA participants to LIFE participants. It was much easier to recruit participants directly through the University of Central Florida's online research system then through LIFE. Almost four times the number of participants were from SONA, which could impact the data for future replications of the study. In the future, researchers should try to recruit more participants from the older generation as it will allow for more meaningful and generalizable results.

This study can impact future literature as this study found that openness to experience was not a predictor of general technology use. Additionally, this study can add to future literature that deals with specific research on personality with specific subscales of measures. More technology is being created every day. Most of the past studies in this area seemed to focus on the positives of technology versus the negatives. Future studies should look more into newer controversial technology like artificial intelligence or smart homes. Additionally, this study can help with future research by helping improvements with advertising new technology towards older adults. Future researchers should focus on the older generation more when it comes to advertising products that they believe only younger adults would buy.

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APPENDIX A: FIVE FACTOR INVENTORY

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 write a number next to each statement to indicate the extent to which you agree or disagree with that statement. Disagree strongly (1) Disagree a little (2) Neither agree nor disagree (3) Agree a little (4) Agree Strongly (5)

I see Myself as Someone Who...

1. Is talkative
2. Tends to find fault with others
3. Does a thorough job
4. Is depressed, blue
5. Is original, comes up with new ideas
6. Is reserved
7. Is helpful and unselfish with others
8. Can be somewhat careless
9. Is relaxed, handles stress well
10. Is curious about many different things
11. Is full of energy
12. Starts quarrels with others
13. Is a reliable worker
14. Can be tense
15. Is ingenious, a deep thinker
16. Generates a lot of enthusiasm
17. Has a forgiving nature
18. Tends to be disorganized
19. Worries a lot
20. Has an active imagination
21. Tends to be quiet
22. Is generally trusting
23. Tends to be lazy
24. Is emotionally stable, not easily upset
25. Is inventive
26. Has an assertive personality
27. Can be cold and aloof
28. Perseveres until the task is finished
29. Can be moody

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

APPENDIX B: MEDIA AND TECHNOLOGY USAGE AND ATTITUDES SCALE

Please indicate how often you do each of the following e-mail activities on any device (mobile phone, laptop, desktop, etc.)

1. (E-mailing subscale) Send, receive and read e-mails (not including spam or junk mail).
2. (E-mailing subscale) Check your personal e-mail.
3. (E-mailing subscale) Check your work or school e-mail.
4. (E-mailing subscale) Send or receive files via e-mail.

Please indicate how often you do each of the following activities on your mobile phone.

1. (Text messaging subscale) Send and receive text messages on a mobile phone.
2. (Phone calling subscale) Make and receive mobile phone calls.
3. (Text messaging subscale) Check for text messages on a mobile phone.
4. (Phone calling subscale) Check for voice calls on a mobile phone.
5. (Smartphone usage subscale) Read e-mail on a mobile phone.
6. (Smartphone usage subscale) Get directions or use GPS on a mobile phone.
7. (Smartphone usage subscale) Browse the web on a mobile phone.
8. (Smartphone usage subscale) Listen to music on a mobile phone.
9. (Smartphone usage subscale) Take pictures using a mobile phone.
10. (Smartphone usage subscale) Check the news on a mobile phone.
11. (Smartphone usage subscale) Record video on a mobile phone.
12. (Smartphone usage subscale) Use apps (for any purpose) on a mobile phone
13. (Smartphone usage subscale) Search for information with a mobile phone.
14. (Text messaging subscale) Use your mobile phone during class or work time.

How often do you do each of the following activities?

1. (TV viewing subscale) Watch TV shows, movies, etc. on a TV set.
2. (TV viewing subscale) Watch video clips on a TV set.
3. (Media sharing subscale) Watch TV shows, movies, etc. on a computer.
4. (Media sharing subscale) Watch video clips on a computer.
5. (Media sharing subscale) Download media files from other people on a computer.
6. (Media sharing subscale) Share your own media files on a computer.
7. (Internet searching subscale) Search the Internet for news on any device.
8. (Internet searching subscale) Search the Internet for information on any device
9. (Internet Searching Subscale) Search the Internet for videos on any device.
10. (Internet searching subscale) Search the Internet for images or photos on any device.
11. (Video gaming subscale) Play games on a computer, video game console or smartphone BY YOURSELF.
12. (Video Gaming Subscale) Play games on a computer, video game console or smartphone WITH OTHER PEOPLE IN THE SAME ROOM.

13. (Video gaming subscale) Play games on a computer, video game console or smartphone WITH OTHER PEOPLE ONLINE.

Do you have a Facebook account? If the answer is ''yes,'' continue with item 32; if ''no'', skip to the Attitudes subscales below. NOTE: The word ''social media'' may be substituted for Facebook in the question stem above and in items 32–34.

How often do you do each of the following activities on social networking sites such as Facebook?

1. (General social media usage subscale) Check your Facebook page or other social networks.
2. (General social media usage subscale) Check your Facebook page from your smartphone.
3. (General social media usage subscale) Check Facebook at work or school.
4. (General social media usage subscale) Post status updates.
5. (General social media usage subscale) Post photos.
6. (General social media usage subscale) Browse profiles and photos.
7. (General social media usage subscale) Read postings.
8. (General social media usage subscale) Comment on postings, status updates, photos, etc.
9. (General social media usage subscale) Click ''Like'' to a posting, photo, etc.

Please answer the following questions about your Facebook and other online friends. NOTE: In items 41 and 42 the words ''social media'' (or any specific social media site) may be substituted for Facebook.

1. Facebook friendships subscale) How many friends do you have on Facebook?
2. (Facebook friendships subscale) How many of your Facebook friends do you know in person?
3. (Online friendships subscale) How many people have you met online that you have never met in person?
4. (Online friendships subscale) How many people do you regularly interact with online that you have never met in person?

Attitudes Subscales: These subscales includes 16 items, which comprise four subscales: Positive Attitudes Toward Technology (6 items), Anxiety About Being Without Technology or Dependence on Technology (3 items), Negative Attitudes Toward Technology (3 items) and Preference for Task Switching (4 items)

5-point Likert scale for all items (with scoring in parentheses): Strongly agree (5), Agree (4), Neither agree nor disagree (3), Disagree (2), Strongly disagree (1)

1. (Positive attitudes) I feel it is important to be able to find any information whenever I want online.
2. (Positive attitudes) I feel it is important to be able to access the Internet any time I want.
3. (Positive attitudes) I think it is important to keep up with the latest trends in technology.
4. (Anxiety/dependence) I get anxious when I don't have my cell phone.
5. (Anxiety/dependence) I get anxious when I don't have the Internet available to me
6. (Anxiety/dependence) I am dependent on my technology
7. (Positive attitudes) Technology will provide solutions to many of our problems.
8. (Positive attitudes) With technology anything is possible.
9. (Positive attitudes) I feel that I get more accomplished because of technology.
10. (Negative attitudes) New technology makes people waste too much time.
11. (Negative attitudes) New technology makes life more complicated.
12. (Negative attitudes) New technology makes people more isolated.
13. (Preference for task switching) I prefer to work on several projects in a day, rather than completing one project and then switching to another.
14. (Preference for task switching) When doing a number of assignments, I like to switch back and forth between the rather than do one at a time.
15. (Preference for task switching) I like to finish one task completely before focusing on anything else.
16. (Preference for task switching) When I have a task to complete, I like to break it up by switching to other tasks intermittently.

APPENDIX C: PSYCHOLOGICAL WELL-BEING QUESTIONNAIRE

Please indicate your degree of agreement (using a score ranging from 1-6) to the following sentences.

1. I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people.
2. In general, I feel I am in charge of the situation in which I live.
3. I am not interested in activities that will expand my horizons.
4. Most people see me as loving and affectionate.
5. I live life one day at a time and don't really think about the future.
6. When I look at the story of my life, I am pleased with how things have turned out.
7. My decisions are not usually influenced by what everyone else is doing.
8. The demands of everyday life often get me down.
9. I think it is important to have new experiences that challenge how you think about yourself and the world.
10. Maintaining close relationships has been difficult and frustrating for me.
11. I have a sense of direction and purpose in life.
12. In general, I feel confident and positive about myself.
13. I tend to worry about what other people think of me.
14. I do not fit very well with the people and the community around me.
15. When I think about it, I haven't really improved much as a person over the years.
16. I often feel lonely because I have few close friends with whom to share my concerns.
17. My daily activities often seem trivial and unimportant to me.
18. I feel like many of the people I know have gotten more out of life than I have.
19. I tend to be influenced by people with strong opinions.
20. I am quite good at managing the many responsibilities of my daily life.
21. I have the sense that I have developed a lot as a person over time.
22. I enjoy personal and mutual conversations with family members or friends.
23. I don't have a good sense of what it is I'm trying to accomplish in life.
24. I like most aspects of my personality.
25. I have confidence in my opinions, even if they are contrary to the general consensus.
26. I often feel overwhelmed by my responsibilities
27. I do not enjoy being in new situations that require me to change my old familiar ways of doing things.
28. People would describe me as a giving person, willing to share my time with others.
29. I enjoy making plans for the future and working to make them a reality.
30. In many ways, I feel disappointed about my achievements in life.
31. It's difficult for me to voice my own opinions on controversial matters.

32. I have difficulty arranging my life in a way that is satisfying to me.
33. For me, life has been a continuous process of learning, changing, and growth.
34. I have not experienced many warm and trusting relationships with others.
35. Some people wander aimlessly through life, but I am not one of them
36. My attitude about myself is probably not as positive as most people feel about themselves.
37. I judge myself by what I think is important, not by the values of what others think is important.
38. I have been able to build a home and a lifestyle for myself that is much to my liking.
39. I gave up trying to make big improvements or changes in my life a long time ago.
40. I know that I can trust my friends, and they know they can trust me.
41. I sometimes feel as if I've done all there is to do in life.
42. When I compare myself to friends and acquaintances, it makes me feel good about who I am.

APPENDIX D: INVENTORY OF PARENT AND PEER ATTACHMENT

Peer Attachment Questions:

1. I like to get my friends' point of view on things I'm concerned about.
2. My friends sense when I'm upset about something.
3. When we discuss things, my friends consider my point of view.
4. Talking over my problems with my friends makes me feel ashamed or foolish.
5. I wish I had different friends.
6. My friends understand me.
7. My friends encourage me to talk about my difficulties.
8. My friends accept me as I am.
9. I feel the need to be in touch with my friends more often.
10. My friends don't understand what I'm going through these days.
11. I feel alone or apart when I am with my friends.
12. My friends listen to what I have to say.
13. I feel my friends are good friends.
14. My friends are fairly easy to talk to.
15. When I am angry about something, my friends try to be understanding.
16. My friends help me to understand myself better.
17. My friends are concerned about my well-being.
18. I feel angry with my friends.
19. I can count on my friends when I need to get something off my chest.
20. I trust my friends.
21. My friends respect my feelings.
22. I get upset a lot more than my friends know about.
23. It seems as if my friends are irritated with me for no reason.
24. I tell my friends about my problems and troubles.
25. If my friends know something is bothering me, they ask me about it.

APPENDIX E: SENSATION SEEKING SCALE

1. A. I like "wild" uninhibited parties
   B. I prefer quiet parties with good conversation
2. A. There are some movies I enjoy seeing a second or even a third time
   B. I can't stand watching a movie that I've seen before
3. A. I often wish I could be a mountain climber
   B. I can't understand people who risk their necks climbing mountains
4. A. I dislike all body odors
   B. I like some for the earthly body smells
5. A. I get bored seeing the same old faces
   B. I like to comfortable familiarity of everyday friends
6. A. I like to explore a strange city or section of town by myself, even if it means getting lost
   B. I prefer a guide when I am in a place I don't know well
7. A. I dislike people who do or say things just to shock or upset others
   B. When you can predict almost everything a person will do and say he or she must be a bore
8. A. I usually don't enjoy a movie or play where I can predict what will happen in advance
   B. I don't mind watching a movie or a play where I can predict what will happen in advance
9. A. I have tried marijuana or would like to
   B. I would never smoke marijuana
10. A. I would not like to try any drug which might produce strange and dangerous effects on me
    B. I would like to try some of the new drugs that produce hallucinations
11. A. A sensible person avoids activities that are dangerous
    B. I sometimes like to do things that are a little frightening
12. A. I dislike "swingers" (people who are uninhibited and free about sex)
    B. I enjoy the company of real "swingers"
13. A. I find that stimulants make me uncomfortable
    B. I often like to get high (drinking liquor or smoking marijuana)
14. A. I like to try new foods that I have never tasted before
    B. I order the dishes with which I am familiar, so as to avoid disappointment and unpleasantness
15. A. I enjoy looking at home movies or travel slides
    B. Looking at someone's home movies or travel slides bores me tremendously
16. A. I would like to take up the sport of water skiing
    B. I would not like to take up water skiing
17. A. I would like to try surf boarding
    B. I would not like to try surf boarding
18. A. I would like to take off on a trip with no pre planned or definite routes, or timetable
    B. When I go on a trip I like to plan my route and timetable fairly carefully
19. A. I prefer the "down to Earth" kinds of people as friends
    B. I would like to make friends in some of the "far out" groups like artists or "punks"
20. A. I would not like to learn to fly an airplane
    B. I would like to learn to fly an airplane

21. A. I prefer the surface of the water to the depths
    B. I would like to go scuba diving
22. A. I would like to meet some persons who are homosexual (men or women)
    B. I stay away from anyone I suspect of being "gay or lesbian"
23. A. I would like to try parachute jumping
    B. I would never want to try jumping out of a plane with or without a parachute
24. A. I prefer friends who are excitingly unpredictable
    B. I prefer friends who are reliable and predictable
25. A. I am not interested in experience for its own sake
    B. I like to have new and exciting experiences and sensations even if they are a little frightening, unconventional, or illegal
26. A. The essence of good art is in its clarity, symmetry of form and harmony of colors
    B. I often find beauty in the "clashing" colors and irregular forms of modern paintings
27. A. I enjoy spending time in the familiar surroundings of home
    B. I get very restless if I have to stay around home for any length of time
28. A. I like to dive off the high board
    B. I don't like the feeling I get standing on the high board (or I don't go near it at all)
29. A. I like to date members of the opposite sex who are physically exciting
    B. I like to date members of the opposite sex who share my values
30. A. Heavy drinking usually ruins a party because some people get loud and boisterous
    B. Keeping the drinks full is the key to a good party
31. A. The worst social sin is to be rude
    B. The worst social sin is to be a bore
32. A person should have considerable sexual experience before marriage
    B. It's better if two married persons begin their sexual experience with each other
33. A. Even if I had the money I would not care to associate with flight rich persons like those in the "jet set"
    B. I could conceive of myself seeking pleasures around the world with the "jet set"
34. A. I like people who are sharp and witty even if they do sometimes insult others
    B. I dislike people who have their fun at the expense of hurting the feelings of others
35. A. There is altogether too much portrayal of sex in movies
    B. I enjoy watching many of the "sexy" scenes in movies
36. A. I feel best after taking a couple of drinks
    B. Something is wrong with people who need liquor to feel good
37. A. People should dress according to some standard of taste, neatness, and style B. People should dress in individual ways even if the effects are sometimes strange
38. A. Sailing long distances in small sailing crafts is foolhardy
    B. I would like to sail a long distance in a small but seaworthy sailing craft
39. A. I have no patience with dull or boring persons
    B. I find something interesting in almost every person I talk to
40. A. Skiing down a high mountain slope is a good way to end up on crutches
    B. I think I would enjoy the sensations of skiing very fast down a high mountain slope

APPENDIX F: DEMOGRAPHIC QUESTIONNAIRE

1. What is your age? _____
2. What is your gender?
    1. Male
    2. Female
    3. Other
3. What race do you best identify with?
    1. White
    2. Black or African American
    3. American Indian and Alaska Native
    4. Asian
    5. Native Hawaiian and Other Pacific Islander
    6. Other race
4. What is your home zip code? _____
5. What is your birthday year? _____
6. How many credit hours do you currently have? If you have already graduated, please write 'not applicable.' _____
7. What is the highest degree you have earned? _____
8. What is your current GPA? If you already graduated, what was your college GPA?_____
9. What was your class ranking *approximately* in high school?
    1. Top ten percent
    2. Top twenty percent
    3. Top thirty percent
    4. Top forty percent
    5. Top fifty percent
    6. Below fifty percent

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