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AGING WELL: HOW SUBJECTIVE AGE, PLAYFULNESS, AND DEPRESSION
INFLUENCE QUALITY OF LIFE AMONG OLDER ADULTS

by

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A dissertation submitted in partial fulfillment of the requirements
for the degree of Doctor of Philosophy
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ABSTRACT

Given the growing population of aging adults, there is a need for research examining factors that enhance quality of life for older adults (QoL; Colby & Ortman, 2014). Changes in health, relationships, support systems, and social identity are inevitable throughout the lifespan. Therefore, research focused on lessening the negative effects of changes due to aging while also improving QoL is warranted. As such, the aim of the current research study was to examine the extent to which subjective age (SA; how old or young an individual *feels*), playfulness (PF; “the ability to frame or reframe everyday situations to experience them as entertaining, intellectually stimulating, and/or personally interesting” [Proyer, 2015, p. 93-94]), and depression (an emotional state ranging from mild discouragement to feelings of extreme despair [CDC, 2017; Corsini, 2002]) predict QoL (“a person’s sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him or her” [Ferrans, 1985, p. 15]) among adults over the age of 55.

Using convenience sampling with eligibility requirements, adults ($N = 1,315$) 55 and older and who spoke and read English were surveyed both face-to-face (F2F) and online (e.g., Amazon Mechanical Turk and a senior educational program). Standard multiple regression was utilized, and results identified a statistically significant model with the variable of depression predicting the largest unique contribution to the model, while PF predicted a small, statistically significant contribution. Subjective age did not statistically contribute to the prediction. Implications from the findings that relate to counselors, counselor educators, and researchers are provided. In addition, the findings provide guidance and a new perspective on variables associated with QoL and aging adults.

To my father
Twenty years ago, you inscribed on the inside cover of *Man's Search for Meaning*,
"To Yvette, my daughter, whose search for meaning
has taken her from *Anne of Green Gables* to this tome..."

I am because you are.

Thank you.

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CHAPTER ONE: INTRODUCTION

By 2050, the population in the United States (U.S.) aged 65 and over is projected to reach 83.7 million, close to double the estimated population of 43.1 million for the same demographic in 2012 (Ortman, Velkoff, & Hogan, 2014). Although people are living longer, aging adults continue to experience high rates of health concerns such as: (a) high cholesterol, (b) diabetes, (c) obesity, (d) hypertension, (e) depression, and (f) isolation (Colby & Ortman, 2014; King, Matheson, Chirina, Shankar, & Broman-Fulks, 2013). The economic impact of chronic illness and other age-related issues in the U.S. is notable. For instance, one age-related issue is poor balance, which can lead to slips and falls. It is estimated that in the U.S. approximately 30 billion dollars is spent annually on treating aging adults for issues related to slipping and falling; this number is expected to increase to approximately 60 billion dollars by 2020 (National Council on Aging, 2017). Another issue of particular concern for aging adults is limited services and treatment for mental health concerns. Aging adults are an often-overlooked demographic in the field of counseling (Kampfe, 2015). As a result, depression in aging adults is left undiagnosed or untreated (Center for Disease Control and Prevention, 2017). Two-thirds of adults over 65 with mental health concerns are unable to receive needed treatment (National Council on Aging, 2017).

Rising healthcare costs associated with the treatment of chronic illnesses increases the need for programs grounded in health prevention and promotion; examples include studying positive states/traits of mental health across the lifespan, discovering factors that increase quality of life (King et al., 2013), and reducing depression (Conrad, Matschinger, Riedel-Heller, von Gottberg, & Kilian, 2014). Therefore, the researcher in this study investigated the extent to

which quality of life (QoL) among aging adults was influenced by variables such as subjective age (SA; how young or old an individual feels), the mindset of playfulness (PF; “the ability to frame or reframe everyday situations to experience them as entertaining, intellectually stimulating, and/or personally interesting” [Proyer, 2015, p. 93-94]), and depression.

Statement of the Problem

The U.S. Census Bureau reported that the largest increase in population among individuals age 65 and older is projected to occur from 2020-2030, when the youngest baby boomers will have turned 65. The result will be an increase of 18 million adults over the age of 65 living in the U.S., bringing the total population to 74 million (Colby & Ortman, 2014). Given the growing population of aging adults, there is a clear need for researchers to focus efforts on understanding and exploring factors that both enhance and impede QoL (Colby & Ortman, 2014). In addition, changes in health, relationships, support systems, and social identity are inevitable throughout the lifespan. As such, research focused on ameliorating the negative effects of changes due to aging and improving QoL is warranted.

Quality of Life

The first studies to address protective factors to mitigate challenges associated with aging were the MacArthur Studies on Successful Aging (Rowe et al., 1998). Researchers utilized a three-wave longitudinal analysis that began in 1988 to investigate elements associated with aging successfully—defined as living longer without major cognitive and physical impairments (Karlamañgla & Seeman, 2007). Participants ($N = 1,189$) between the ages of 70-79 were given

assessments related to: (a) demographics, (b) health status, (c) chronic illnesses, (d) medications, (e) psychosocial characteristics, (f) health behaviors, and (g) cognitive and physical performance. Surviving participants ($n = 1,012$) were interviewed and reassessed three years later in 1991, and again between 1995-1997 with 722 remaining participants. Researchers found that the top three factors that mitigated aging challenges were: (a) social engagement, (b) receiving and giving emotional support, and (c) maintaining self-efficacy (Karlman & Seeman, 2007). The findings from the MacArthur Study provided insights into factors that could increase successful aging, while also laying the foundation for future studies to continue examining aspects and components of QoL.

The National Institute of Aging (NIA) has prioritized research focused on improving QoL through prevention and healthy lifestyle promotion programs designed to lower rising healthcare costs (Colby & Ortman, 2014; Conrad et al., 2014; King et al., 2013). Defining QoL has been a challenge however, as it has been confounded in the literature by researchers providing varying definitions. The World Health Group (1998) defined QoL as a multidimensional concept that includes personal evaluations of both positive and negative aspects of life. Similarly, subjective well-being has been broadly defined as including “phenomena such as life satisfaction, positive affect, and low negative affect, such as infrequent sadness, anger, and fear” (Diener & Chan, 2011, p. 25). Moreover, well-being, a term often used interchangeably with QoL, includes aspects of satisfaction with life and implies contentment or acceptance of an individual’s wants and/or needs across a lifespan (Bonomi, Patrick, Bushnell, & Martin, 2000; Theofilou, 2013). Although definitions of QoL vary, defining characteristics include individuals’ sense of well-being, or their level of satisfaction with their life (Ferrans, 1990). Moreover, feeling satisfied

with life can serve as a protective factor against declines in physical health and loss of significant roles related to aging (Friedman et al., 2017). Therefore, for the purposes of this research study, QoL has been defined as “a person’s sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him or her” (Ferrans, 1985, p. 15). In other words, an individual’s overall satisfaction with life.

Catalysts for Quality of Life

Historically, studies on social support and self-efficacy among aging adults are prolific and have been shown to be strong predictors of aging well and/or increasing overall life satisfaction (see studies such as: Grembowski, et al., 1993; Newsom & Schulz, 1996; Seeman, Lusignolo, Albert, & Berkman, 1995; Shin, Kim, & Choi, 2016; Shiovitz-Ezra & Litwin, 2015; Yu, McCammon, Ellison, & Langa, 2016). However, there are fewer studies related to SA and PF as they relate to life satisfaction and each other within counseling research. With increased interest in enhancing QoL among aging adults, SA and PF are two variables that, although understudied in the counseling arena, have been shown to positively influence QoL (see Proyer, 2013; Westerhof & Barrett, 2005).

Subjective age refers to how old or young individuals *feel*. Research on SA dates back more than 65 years, with current empirical focus on the notion that aging is both a biological as well as a subjective experience and an important marker of development (Montepare, 2009). Moreover, research has indicated that SA may be a stronger predictor than chronological age in terms of aging adults’ psychological functioning (Montepare, 2009; Schafer & Shippee, 2010; Stephan, Caudroit, & Chalabaev, 2011). In fact, several studies have demonstrated that a younger

SA was found to contribute to various aspects of QoL: (a) better coping strategies (Boehmer, 2007); (b) better mental and physical functioning (Caudroit, Stephan, Chalabaev, & Le Scann, 2012); (c) slower cognitive decline (Stephan, Sutin, Caudroit, & Terracciano, 2016); and (d) longevity (Westerhoff et al., 2014). Moreover, SA remains a predictor of life satisfaction, even when variables such as chronological age, gender, socioeconomic status, marital status, and objective and subjective health are controlled (Westerhof & Barrett, 2005). Therefore, SA and its relationship to QoL is an important variable to study within aging adults.

Playfulness is defined as “the ability to frame or reframe everyday situations to experience them as entertaining, intellectually stimulating, and/or personally interesting” (Proyer, 2015, p. 93-94), and has been shown to contribute to: (a) well-being (Proyer, 2013); (b) resilience among aging women (Chang, Yarnal, & Chick, 2016); and (c) improved ability to handle stress (Magnuson & Barnett, 2013). In addition, PF has been linked to aspects of QoL such as physical and psychological well-being and resilience (Proyer, 2013; Saunders, Sayer, & Goodale, 1999), and has been shown to positively impact an individual’s sense of humor which can assist in improved mental functioning and successful adjustment (Berk, 2001; Monahan, 2016). In fact, individuals who possess a sense of humor have fewer symptoms of depression, helping to increase QoL among adults (Lebowitz, Suh, Diaz, & Emery, 2011). Moreover, PF facilitates QoL as it can improve cognitive, emotional, social, and psychological functions in older adults by helping them become more cognitively flexible (Yarnal & Qian, 2011). Furthermore, there is limited evidence that supports a link between PF and aspects of healthy aging (Yarnal & Qian, 2011). Thus, when studying factors that can enhance QoL, PF is a

variable that has shown viability in several populations, warranting further exploration with aging adults.

Barriers to Quality of Life

Mental health concerns can influence an individual's satisfaction with life. One of the most frequent mental health issues among aging adults is depression (Blazer, 2003). Older adults are at an increased risk for developing depression as it is more common with individuals who have health related illnesses (Center for Disease Control and Prevention, 2017). In fact, chronic health conditions predispose the aging adult to depression, and current statistics show that approximately 80% of older adults have at least one chronic health condition and 50% have two or more health conditions (Center for Disease Control and Prevention, 2017). Thus, depression is a significant variable when studying healthy aging, as it can lower QoL. Baernholdt and colleagues (2012) examined three dimensions of QoL in adults ($N = 911$) age 65 and older. Linear regression results indicated factors that hindered QoL were lessened activities of daily living (ADL), memory problems, and depression. For instance, depression was associated with poorer health-related QoL ($B = 0.293$, (0.02) , $p < 0.001$) and emotional well-being ($B = -0.050$ (0.01) , $p < 0.001$; Baernholdt, Hinton, Yan, Rose, & Mattos, 2012). The results demonstrated that depression can negatively impact and/or hinder QoL among aging adults. In a related study, Raggi and colleagues (2016) studied individuals ($N = 5,639$) across three European countries (Finland, Poland, and Spain). Researchers used Hierarchical regression models and results showed that depression ($B = -3.18$, $p \leq .001$), mild sadness ($B = -2.81$, $p \leq .001$), and moderate

sadness ($B = -7.07, p \leq .001$) had a significant inverse association with QoL (Raggi et al., 2016). Thus, the variable of depression, a more familiar construct, was added to the study.

Theoretical Foundation

The broaden-and-build theory of positive emotion (Fredrickson, 1998, 2001) served as the primary theoretical foundation for this research investigation, which examined the constructs of SA, PF, depression, and QoL. The broaden-and-build theory of positive emotions combines aspects of both hedonic (pleasure-seeking) well-being and eudaemonic (potential and purpose-seeking) well-being (Kashdan, Biswas-Diener, & King, 2008). The broaden-and-build theory states that positive emotions, while momentary, can provide long-lasting impact on an individual, enhancing overall well-being (Garland et al., 2010). Furthermore, the benefit of experiencing positive emotions can *broaden* an individual's range of thought-action skills and *build* lasting personal resources (Fredrickson 1998, 2001). In other words, individuals who experience more positive emotions have access to a wider range of coping skills and can adapt better to adversity (Dolphin, Steinhardt, & Cance, 2015). In fact, positive emotions can encourage novel, diverse, and exploratory actions and thoughts (Compton, 2005). Positive emotions can also transform individuals by helping them become: (a) more creative, (b) healthier, (c) socially integrated, (d) knowledgeable, and (e) resilient (Fredrickson, 2005).

Many researchers have used the broaden-and-build theory in empirical studies (see Dolphin et al., 2015; Smith & Hollinger-Smith, 2015; Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Tugade & Fredrickson, 2004). Tugade and Fredrickson (2004) investigated the influence of positive emotions on resilience with university students ($N = 192$) between the ages of 18-23.

Results demonstrated that experiencing and identifying positive emotions helped students to later find positive meaning from a negative experience. In addition, researchers demonstrated that individuals' immune systems were influenced by positive emotions. Cohen and colleagues (2003) investigated the theory that individuals who experience more positive emotions are less at risk for developing a cold. Participants ($N = 334$) were between the ages of 18-54 and were screened for sickness and baseline health information. In addition, participants completed assessments on their emotional styles (e.g. positive outlook versus negative outlook). Participants then received nose drops that carried one of two strains of the common cold, and they were subsequently then quarantined for five days. The participants reported daily on their emotional state as well as their health. They were also assessed physically. Approximately 28 days after they received the nose drops, participants' blood was collected and analyzed. Colds were assessed by measuring infection levels and/or studying the mucus of the participants. Results of multiple linear regression revealed that for both strains of the cold, increases in a positive emotional style (PES) were associated with decreases in the rate of colds ($b = -.48 [\pm .19]$). A negative emotional style (NES) was not associated with the risk for illness (Cohen et al., 2003). Although this study utilized a younger sample population than the current research study, the influence of positive emotions, such as PF and feeling younger, offers significant opportunities for future research.

Another study examined savoring positive experiences and the psychological well-being of older adults (Smith & Hollinger-Smith, 2015). Participants ($N = 164$) ages 55 and older were given inventories that assessed: (a) savoring, (b) resilience, (c) psychological well-being, (d) happiness, and (e) depression. Multiple regression analyses were conducted, and study results

indicated that higher savoring scores predicted higher levels of happiness ($b = .73, \beta = .54, p < .001$). In addition, higher resilience was associated with higher happiness scores ($b = .43, \beta = .24, p = .001$). Furthermore, for participants who had higher resilience, there was a significant positive relationship between savoring and happiness ($b = .58, \beta = .43, p < .001$). Moreover, for individuals with lower resilience, higher savoring predicted higher happiness scores ($b = .88, \beta = .65, p < .001$). In other words, older adults who had a greater capacity to enjoy positive experiences displayed higher levels of happiness (Smith & Hollinger-Smith, 2015). In summary, experiencing or savoring positive emotions can help an aging individual develop and/or expand coping strategies. Additionally, SA and PF are two variables that can enhance positive emotions. An increase in positive feelings can in turn, broaden-and-build the coping strategies aging adults can employ, to help them lower their risk of depression and increase their QoL.

Purpose of Study

Current research that examines the relationships between the variables of, SA, PF, depression, and QoL, among aging adults is limited. In addition, within counselor education, research studying SA and PF has yet to be conducted. Thus, research is needed that examines the associations between SA, PF, depression, and QoL among aging adults, specifically examining the extent to which these variables predict QoL for adults 55 and older.

Primary Research Question

The current study sought to examine the following question: To what extent does subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman,

1981] and a single item question), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen, Chick, & Zinn, 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink, Yesavage, Lum, Heersema, Adey, & Rose, 1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener, Emmons, Larsen, & Griffin, 1985]) among adults 55 and older?

Secondary Research Question 1.A

In addition, after controlling for the possible effect of depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]), does subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question) and playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), still predict a significant amount of the variance in overall QoL (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among adults 55 and older?

Secondary Research Question 1.B

Furthermore, to what extent does subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among adults (55+) for each group of recruited participants (e.g., face-to-face and online)?

Exploratory Research Questions

1. Is there a difference between aging adults' (a) subjective age (as measured by the *CAS* [Barak, 1979; Barak & Schiffman, 1981] and a single item question), (b) playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]), and quality of life (as measure by *SWLS* [Diener et al., 1985]) based on the data collection method (online or face-to-face?)
2. Is there a difference between aging adults' (a) subjective age (as measured by the *CAS* [Barak, 1979; Barak & Schiffman, 1981] and a single item question), (b) playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), (c) depression (as measured by the *GDS* [Brink et al., 1982]), quality of life (as measured by *SWLS* [Diener et al., 1985]) and their reported demographic variables (e.g., gender, age, race, relationship status, education, etc.)?

Significance of the Study

Aging adults are a growing population living in the United States; therefore, research focused on improving QoL is warranted. As such, the aim of the research study was to explore the predictive ability of SA, PF, and depression on QoL for aging adults. Results from this investigation provide: (a) increased awareness of how counselors and other practitioners could support successful aging and (b) further understanding of the relationship between SA and PF. Prior studies (see MacArthur Studies on Successful Aging) identify one way to improve QoL is to widen social support. While existing research supports the importance of social support and its

relationship to QoL, increasing an individual's existing social networks is challenging. However, if PF is found to be a significant predictor of QoL, interventions could be tailored to include ways to increase PF, potentially resulting in improved QoL. Additionally, the findings from this investigation contribute to a growing body of literature regarding QoL among adults 55 and older.

Methods

Prior to data analysis, approval was sought from the university's institutional review board (IRB). Once approval was gained, the researcher sought to gather data from face-to-face (F2F) interactions and online via Amazon Mechanical Turk (MTurk). Amazon Mechanical Turk is an online platform that allows individuals around the world to participate in survey research. In addition, the researcher collected data from participants F2F from the following locations: (a) women's clubs, (b) libraries, (c) churches, (d) senior centers, (e) community centers, and (f) retirement facilities. Therefore, the current study utilized data collected F2F and online from individuals 55 and older.

Research Design

The research study employed a descriptive, correlational research design to investigate the research questions of this investigation. As such the data was analyzed using standard multiple regression to study the relationship of predictor variables (e.g., SA, PF, and depression) on the criterion variable (e.g., QoL). Multiple regression not only provides information on the

joint effect of all three variables on QoL, but it also allows for the study of each variable to determine its unique influence on the dependent variable (Pallant, 2013).

Participants and Sampling Procedures

Currently there are over 47.8 million adults over the age of 65 living in the United States (U.S. Census Bureau, 2017). With the inclusion of individuals 55-65, the estimation of 47 million would be higher. As such, it is important to have an appropriate sample size to ensure population representation and statistical power (Gall, Gall, & Borg, 2007). In addition, sample size is an essential component in reducing the chances of making a Type II error (fail to reject a false null hypothesis) for the hypothesized outcome. *A priori* sample size calculation for multiple regression was determined using G-power. For this study, based on a desired power of (0.95) with an effect size (0.1), with three predictors, at a probability of $p < 0.05$, the recommended minimum sample size was 110 participants. In addition, based on previous research with aging adults a survey response rate of 50% for face-to-face participants (see Edelman study, 2013) was expected. However, with the additional use of Amazon Mechanical Turk (MTurk), an online platform designed to gather survey answers quickly, as well as the fact that a larger sample size increases generalizability (Gall et al., 2007), the researcher sought a sample of 220 surveys to ensure at least 110 completed surveys. The researcher utilized convenience sampling with eligibility criteria (e.g., 55+ and having the ability to read/speak English) and community-based recruitment for half of the participants ($n = 110$), and MTurk for the remaining half of participants ($n = 110$). Convenience sampling is deemed reasonable when the entire population is

not available for sampling (Gall et al., 2007). In total, the researcher was able to gather 1,315 completed surveys for the study.

Face-to-Face Recruitment

The researcher utilized convenience sampling with inclusion criteria (e.g., 55 and older, and having the ability to read/speak English) for community-based recruitment of participants. Recruitment locations used were: (a) women's clubs, (b) libraries, (c) churches, (d) senior centers, (e) community centers, and (f) retirement facilities. The researcher gained access to these locations through personal and professional contacts. Recruitment of 377 participants took place between December 7, 2017 to January 19, 2018. Surveys collected F2F were incentivized with light refreshments.

Online Recruitment

The online platform, MTurk, began in 2005 and reported that it exceeds 500,000 workers (or participants) from 190 countries ("Amazon Mechanical Turk Requestor Tour," 2005-2017). In addition, studies have demonstrated that it is rare for a participant to complete the same survey repeatedly (Chandler, Mueller, & Paolacci, 2014). An online version of the survey was made available on MTurk to individuals who met the following inclusion criteria: (a) adults 55 years of age or older, and (b) fluent in English. Surveys on MTurk were incentivized by paying \$.50 per completed survey. In addition, participants from a senior education program in Central Florida also answered the survey online. Therefore, a total recruitment of 938 participants took place between December 5, 2017 to January 19, 2017.

Instrumentation

Participants completed four assessments including: (a) subjective age (as measured by *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question [e.g., “*Sometimes people feel older or younger than their age. During the last month, what did you feel most of the time?*”]); the (b) the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]; (c) the *Geriatric Depression Scale: Short Form* (GDS; Brink et al., 1982; and (d) quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]). In addition, participants completed an 11-question researcher-developed demographic form.

Subjective Age

Similar to previous studies, SA was assessed by using the CAS (Barak, 1979; Barak & Schiffman, 1981) and by using a single item question (e.g., *Sometimes people feel older or younger than their age. During the last month, what did you feel most of the time?*; see Klenspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008; Kotter-Grühn, Neupert, & Stephan, 2015; Kotter-Grühn, Kleinspehn-Ammerlahn, Gerstorf, & Smith, 2009; Mock & Eibach, 2011; Rubin & Bersten, 2006; Stephen, Sutin, Caudroit, & Terracciano, 2016; Westerhof & Barrett, 2005). The four-item CAS (Barak, 1979; Barak & Schiffman, 1981) was created from Kastenbaum and colleagues’ 1972 four domains of SA. The questions capture the four dimensions of aging: (a) body (health/fitness/attractiveness); (b) life satisfaction; (c) personality/attitude (self-efficacy/optimism/view of old age); and (d) behavior (youth-preserving activities/learning new things; Teuscher, 2009). Instructions outline that participants are to check which decade (20s – 80s) they feel that they belong in for each of the four questions. A structural model of the

measurement demonstrated a Cronbach alpha of .74 with a strong goodness of fit: $X^2(2) = 1.223$, $p = .542$; TLI = 1.00; CFI = 1.00; RMSEA = .00 (Teuscher, 2009). Once individuals have selected their choices, midpoints (e.g., 40 = 45) were found for each decade selected and an average score was calculated. Using the participants actual age and the average score from the CAS, proportional discrepancy scores were utilized to identify the SA.

Proportional discrepancy scores were calculated by subtracting participants' felt age from their actual age with the difference being divided by actual age [(felt age minus actual age)/actual age]. A negative value indicated a younger SA while a positive value indicated an older SA (Choi, DiNitto, & Kim, 2014; Kotter-Grühn et al., 2015; Kotter-Grühn & Hess, 2012). The benefit of using discrepancy scores is that this type of calculation also considers a person's actual age, as feeling 70 is different for a 65-year-old than it is for an 80-year-old (Kotter-Grühn et al., 2015). Furthermore, discrepancy scores are recommended for studies that test participants from a wide range of ages to control for the effects of actual age (Kotter-Grühn et al., 2015).

For the second measure of SA, using the single item question of "*Sometimes people feel older or younger than their age. During the last month, what did you feel most of the time?*" The researcher used proportional discrepancy scores to identify a SA, by using the felt age reported along with their actual age.

The Adult Playfulness Trait Scale

The APTS (Shen et al., 2014a) is a 19-item instrument that measures three areas of adult playfulness: (a) fun-seek motivation, (b) uninhibitedness, and (c) spontaneity. The APTS utilizes a seven-point Likert scale with options ranging from 1 (strongly disagree) to 7 (strongly agree).

A total score for the instrument can be calculated, along with total scores for each of the three subscales. The APTS has demonstrated good internal consistency (Cronbach's alpha = .87 for the entire scale and .68-.87 for the subscales). In addition, the predictive validity of the scale is good ($r = .55, p < .01$; Shen, Chick, & Pitas, 2017). Furthermore, factorial validity was established by exploratory and confirmatory factor analyses, including the following goodness of fit indices: $WLR\chi^2 = 978.318, p < .001, SB\chi^2 = 5.111, df = 146, SRMR = .087, NFI = .999, CFI = 1.000$.

The Geriatric Depression Scale: Short Form

The GDS scale (Brink et al., 1982) is a 15-item self-rated screening tool to measure depressive symptoms in aging adults. In addition, the GDS is designed to distinguish symptoms of depression from dementia. Scores greater than five indicate a possibility of depression while those greater than 10 indicate a higher likelihood of depression (Smarr & Keefer, 2011). The 15-item GDS has no subscales and has internal consistency that ranges widely from 0.074-0.821 (Friedman, Heisel, & Delavan, 2005; Van Marwijk et al., 1995).

The Satisfaction with Life Scale

The SWLS scale (Diener et al., 1985) is composed of five statements that measure satisfaction with one's life. Responses to each of the five questions are recorded on a Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree), thereby resulting in a total score that falls between 5-35. Individuals with higher scores demonstrate higher levels of life satisfaction. The SWLS demonstrated good reliability with a two-month test-retest correlation coefficient of .82, and coefficient alpha of .87; furthermore, factor analysis resulted in a single factor

accounting for 66% of the variance (Diener et al., 1985). In addition, internal consistency with item correlations for the five items are: .81, .63, .61, .75, and .66 respectively (Diener et al., 1985). In a recent analysis with Mexican adults ($N = 13,220$), internal consistency of the GDS was 0.74. Exploratory factor analysis resulted in a unique factor that explained 54.2% of the total variance and had an eigenvalue of 2.71; moreover, each item showed a high saturation with factor weights between 0.61 and .83 (Lopez-Ortega, Torres-Castro, & Rosas-Carrasco, 2016).

General Demographic Form

The researcher included a general demographic questionnaire to collect participant data related to various demographic variables (e.g., chronological age, gender, and ethnicity). Additionally, the general demographic questionnaire included items related to education level, relationship status, average income, and subjective health. Subjective health was reported through one question: “*on a scale from 1-6, on a whole, how do you rate your current health?*” The researcher selected these demographic variables because they were commonly used in other similar research studies (see Kotter-Grühn et al., 2015; Mock & Eibach, 2011; Stephen, Sutin, Caudroit, & Terracciano, 2016).

Data Analyses

The researcher collected data F2F and online through a survey hosted on MTurk. The researcher used standard multiple regression to analyze the data. Preliminary analysis of the data involved checking the data for possible violations of assumptions for multiple regression, including the following: (a) ensuring independence of observations, (b) confirming linear relationships between dependent and independent variables, (c) checking for homoscedasticity,

(d) checking for multicollinearity and (e) examining potential outliers. In addition, the researcher checked for missing data and if there was, if the missing data was missing at random (MAR), missing completely at random (MCAR), or missing not at random (MNAR; Tabachnick & Fidell, 2013).

The theoretical equation that was tested using multiple regression contained predictor variables (e.g., SA, PF, and depression) and a criterion variable (e.g., QoL; Tabachnick & Fidell, 2013). The researcher also used parametric statistical procedures to examine the exploratory research questions in this investigation which included: (a) descriptive statistics (to better understand the demographic information of the population sampled), (b) Pearson Product-Moment Correlations (to measure the strength and direction of the linear relationship between each independent variable and the dependent variable), and (c) One-way analysis of variance (ANOVA; to compare the variability in scores between and within different groups for the exploratory questions).

Summary

In chapter one the researcher presented an outline of the research study, including the statement of the problem, the theoretical foundation, purpose, research question, and significance. The researcher also introduced the research design including information regarding population and sampling procedures, instruments, data collection methods and data analysis. Therefore, this study aimed to test the theoretical model that subjective age, playfulness, and depression influence quality of life among aging adults (55+).

Operational Definitions

- Aging Adults: Adults 55 years of age and older who speak and read English.
- Depression: An emotional state of enduring sadness ranging from mild discouragement and gloominess to feelings of extreme despair. Feelings are usually accompanied by irritability, restlessness, loss of interest in activities or hobbies, or difficulty remembering (Center for Disease Control and Prevention, 2017; Corsini, 2002).
- Quality of Life (QoL): Measured by SWLS (Diener et al., 1985), QoL is defined as “person’s sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her” (Ferrans, 1985, p. 15).
- Subjective Age (SA): Measured by the CAS (Barak, 1979; Barak & Schiffman, 1981) and a single item question, SA refers to how young or old individuals feel in comparison to their actual years (Kastenbaum, Derbin, Sabatini, & Artt, 1972). In addition, SA also takes into account factors such as life satisfaction, frequency of physical and cognitive symptoms of aging, as well as a person’s beliefs and fears about the aging process (Montepare & Lachman, 1989).
- Successful Aging: “A state wherein an individual is able to invoke adaptive psychological and social mechanisms to compensate for physiological limitations to achieve a sense of well-being, high self-assessed quality of life, and a sense of personal fulfillment, even in the context of illness and disability” (Young, Frick, & Phelan, 2009, p. 88-89).
- Playfulness (PF): Measured by the APTS (Shen et al., 2014a), PF is defined as, “an individual differences variable that allows people to frame or reframe everyday situations

in a way such that they experience them as entertaining, and/or intellectually stimulating, and/or personally interesting” (Proyer, 2015, p. 93-94).

CHAPTER TWO: LITERATURE REVIEW

Chapter two reviews five major areas of theory and research: (a) quality of life, (b) subjective age, (c) playfulness, (c) depression, and (d) the broaden-and-build theory of positive emotions. The chapter begins with a discussion of the target population, aging adults (55+). Next, the main concepts of the study's criterion variable, quality of life (QoL) and research related to the three predictor variables: subjective age (SA), playfulness (PF), and depression are reviewed. Following the description of the study's constructs, the primary theoretical framework, the broaden-and-build theory of positive emotions (Fredrickson, 1998, 2001) is reviewed. The chapter concludes with an integration of constructs to provide support for the current research investigation.

Aging Adults

In 2050, the estimated population of individuals aged 65 and over is projected to be 83.7 million, close to double the estimated population of 43.1 million individuals in 2012 in the United States (U.S.; Ortman, Velkoff, & Hogan, 2014). Researchers, policy-makers, and health care providers agree that increases in longevity will have significant financial impact on health care systems and society (Ní Mhaoláin et al., 2012). In addition, aging adults continue to experience high rates of health concerns such as: (a) high cholesterol, (b) diabetes, (c) obesity, (d) hypertension, (e) depression, and (f) isolation (Colby & Ortman, 2014; King, Matheson, Chirina, Shankar, & Broman-Fulks, 2013). Moreover, the economic impact of chronic illness and age-related issues in the United States are notable. For instance, it is estimated that 30 billion dollars is spent annually on treating aging adults for issues related to slipping and falling, but this

number is expected to increase to approximately 60 billion dollars by 2020 (National Council on Aging, 2017). Furthermore, due to limited services, and lack of insurance coverage, two-thirds of adults over 65 with mental health concerns are unable to receive needed treatment (National Council on Aging, 2017).

Population growth and rising healthcare costs have increased the need for research and service programs to focus on health prevention and promotion, to mitigate age related issues. Therefore, research focused on understanding positive states/traits of mental health across the lifespan, discovering factors that increase QoL, and reducing depression are warranted (Conrad, Matschinger, Riedel-Heller, von Gottberg, & Kilian, 2014; King et al., 2013). Further, the generation commonly referred to as the Baby Boomers, highlights the need for increased research on social and personal factors that contribute to overall QoL.

The Baby Boomers

Due to their large numbers, Boomers have always had an oversized presence in society compared with other generations (Fry, 2016). Although the generation is large, most historians agree that Boomers are comprised of two subgroups: the first wave born between 1946-1955, and the second wave born between 1956-1964 (Tywoniak, 2015). Moreover, Boomers are changing the way society views aging, as adults continue to live longer, certain age milestones are losing significance. For example, more people are working past the age of retirement, thereby altering age 65 as a pivotal moment in a person's life (Day, 2014). In addition, as Boomers get older, they are remaining active, spending their money, and trying new experiences (Walker Smith & Clurman, 2009). Boomers' behavior contrasts with previous generations who typically

withdrew from society. Moreover, Boomers have always maintained an interest in self-improvement. For example, Boomers are searching for experiences that are meaningful and for ways to develop characteristics such as: (a) vitality, (b) energy, (c) authenticity, (d) excitement, and (e) joy (Walker Smith & Clurman, 2009). These intangible characteristics are not only important to aging adults, but also to researchers who study ways to increase healthy aging and QoL.

Longitudinal Research on Aging

The Harvard Study of Adult Development is a landmark, longitudinal study on healthy aging. The study started in 1938, comparing two groups of men, one group from Harvard ($n = 268$) from the classes of 1939-1944, and the other from the inner-city of Boston ($n = 456$) from 1940-1945 (Massachusetts General Hospital, 2017). Today, 59 of the original subjects are still alive and the study has expanded to include offspring and wives (Mineo, 2017). The findings of the study demonstrated that close relationships were a better predictor of longevity and happiness than social class, IQ, or genetics (Mineo, 2017). In addition, results highlighted seven factors that predicted healthy aging: (a) physical activity, (b) absence of alcohol abuse, (c) absence of smoking, (d) mature coping mechanisms, (e) healthy weight, (f) a stable marriage, and (g) education (Vaillant, 2002). Furthermore, results showed that, more than early-life experiences, how an individual lives at age 50 can impact his or her happiness at age 70 (Powell, 2012).

Another landmark study, the MacArthur Studies on Successful Aging (Rowe et al., 1998) studied protective factors to mitigate aging challenges. The study was a three-wave longitudinal analysis that began in 1988 to investigate elements associated with aging successfully—defined

as living longer without major cognitive and physical impairments (Karlamañgla & Seeman, 2007). Participants ($N = 1,189$) were men and women between the ages of 70-79 who completed assessments related to: (a) demographics, (b) health status, (c) chronic illnesses, (d) medications, (e) psychosocial characteristics, (f) health behaviors, and (g) cognitive and physical performance. Surviving participants ($n = 1,012$) were interviewed and reassessed three years later in 1991, and again between 1995-1997 with 722 remaining participants (Karlamañgla & Seeman, 2007). Results of the study indicated that there were three factors that mitigated aging challenges: (a) social integration, (b) emotional support, and (c) self-efficacy (Karlamañgla & Seeman, 2007). Findings from this landmark study provided insights into factors that can increase QoL and laid the foundation for future empirical studies using the three factors specified.

The Harvard and MacArthur studies provide insights into factors that can increase QoL with aging adults. Both studies demonstrated that close relationships (which includes social integration and emotional support) contribute to successful aging. As a result, studies on social support for aging adults are prolific and have been shown to be strong predictors of aging well and/or increasing QoL (see studies such as: Seeman, Lusignolo, Albert, & Berkman, 2001; Newsom & Schulz, 1996; Seeman, Lusignolo, & Shiovitz-Ezra & Litwin, 2015; Yu, McCammon, Ellison, & Langa, 2016).

Quality of Life

The National Institute of Aging (NIA) has prioritized research focused on improving QoL through prevention and healthy lifestyle promotion programs because of rising healthcare costs (Colby & Ortman, 2014; Conrad et al., 2014; King et al., 2013). Quality of life remains an

important variable to study as, researchers believe that increasing aspects of QoL among aging adults will ultimately decrease healthcare costs (Dominick, Ahern, Gold, & Heller, 2002). Thus, the focus in gerontology research has shifted from avoiding age-related decline, to promoting ways of optimal aging (Waldman-Levi, Bar-Haim Erez, & Katz, 2015). In fact, increased levels of life satisfaction have been associated with other positive and protective measures such as: (a) physical exercise, (b) a healthier diet, (c) not smoking, and (d) wearing sunscreen (Grant, Wardle, & Steptoe, 2009). Conversely, for individuals age 65 and older, lower QoL has been associated with lower activities of daily function (ADL), memory problems, and higher depression (Baernholdt, Hinton, Yan, Rose, & Mattos, 2012). Life satisfaction can serve as a protective factor against declines in physical health and loss of significant roles related to aging (Friedman et al., 2017). Therefore, it is vital to find ways to increase QoL to effectively lower the risk of age related challenges. Defining QoL has been a challenge as it has been confounded in the literature by researchers providing varying terms and definitions. For example, The World Health Group (1998) defined QoL as a multidimensional concept that includes personal evaluations of both positive and negative aspects of life. Similarly, subjective well-being has been broadly defined as including “phenomena such as life satisfaction, positive affect, and low negative affect, such as infrequent sadness, anger, and fear” (Diener & Chan, 2011, p. 25). Moreover, well-being, a term often used interchangeably with QoL, includes aspects of satisfaction with life and implies contentment or acceptance of an individual’s wants and/or needs across a lifespan (Bonomi, Patrick, Bushnell, & Martin, 2000; Theofilou, 2013). Furthermore, other researchers have stated that although the term QoL is complex, it embraces both well-being and life satisfaction concepts (Enkvist, Ekstrom, & Elmstahl, 2011). To simplify

the matter, several researchers have posited that QoL should be defined in terms of life satisfaction (Ferrans, 1996, 1990a; Rejeski & Mihalko, 2001; Zhan, 1992). Thus, a definition of QoL utilized in this research study is, a “person’s sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him/her” (Ferrans, 1985, p. 15).

Catalysts for Quality of Life

Studies have revealed that a variety of factors such as health, social connection, a sense of control, and positive emotions positively influence QoL. For example, Enkvist and colleagues (2012) demonstrated several factors that predicted QoL among aging adults. The study utilized data from a three-year longitudinal study among adults ($N = 681$) aged 78-98 years of age living in Sweden. Participants were given measures that assessed for: (a) QoL, (b) subjective health, (c) activities of daily living (ADL), (d) mental state, (e) social network, and (f) locus of control. Survey information was analyzed at baseline and again three years later. Results from logistic regression analysis indicated five factors that predicted life satisfaction three years later: (a) number of health symptoms ($B = -0.075, p = 0.001$); (b) locus of internal control ($B = 0.090, p = 0.006$); (c) depressive mood ($B = -0.086, p = 0.014$); (d) marital status vs being single ($B = -0.538, p = 0.031$); and (e) higher age ($B = -0.052, p = 0.010$). Coefficient of determination (Nagelkerkes’ R^2) for this model was 0.29, indicating that there was strong evidence of the impact of health symptoms, locus of control, depressive mood, relationship status, and age on QoL (Enkvist et al., 2012). A limitation to the study was generalizability, as the participants were from Sweden and may not be representative of aging adults in the U.S. However, the results of

the study demonstrate a variety of variables that can predict QoL, such as health, sense of control, depression, relationship status, and age.

In a longitudinal study, Solomon and colleagues (2010) examined QoL in older adults with advanced illness. The study was conducted from 1999 – 2002 and comprised of individuals ($N = 185$) over the age of 60 with advanced cancer, heart failure, or chronic pulmonary disease. Every four months, participants were asked how they would rate their QoL. In addition, participants were assessed for depression, anxiety, instrumental and emotional support, and for religiosity and/or spirituality. Participants' responses on evaluating their QoL were not significantly different between baseline and final interviews. Specifically, 65% of the participants reported "best possible" or "good" QoL at baseline, and 60% reported "best possible" or "good" QoL at the final interview. The results of a multivariate analysis revealed that four variables remained statistically significant: (a) depressed mood (odds ratio = .42, 95% CI = 0.27-0.66); (b) greater ADL disability (odds ratio = 0.85, 95% CI = 0.75-0.95); (c) better self-rated health (odds ratio = 4.79, 95% CI = 2.99-7.69); and (d) church closeness (odds ratio = 1.99, 95% CI = 1.17-3.39). In other words, participants who had higher rates of depression or were unable to perform their activities of daily living had lower QoL whereas, those who had better self-rated health and felt closer to their church had higher QoL. Limitations to the study included a lack of ethnic or racial diversity in the population sample. In addition, because of the length of time in between interviews, aspects of QoL may not have been captured. Moreover, missing data was related to participant mortality. Despite these limitations, the study remains important as it demonstrates that illness or poor health does not immediately infer diminished QoL (Solomon, Kirwin, Van Ness, O'Leary, & Fried, 2010). Moreover, the study demonstrated

that a variety of variables such as depression, daily functioning, self-rated health, and social connection predict QoL.

Positive Emotions

Bowling and Liffie (2011) surveyed individuals ($N = 999$) over the age of 65 once in 1999/2000 and followed-up with survivors ($N = 287$) in 2007/2008 to investigate which factors, biological, psychological or social, best predicted successful aging. Participants were given measurements that assessed: (a) QoL; (b) biomedical aspects (i.e. health); (c) social functioning; and (d) psychological factors as measured by self-efficacy and optimism instruments. Results from multiple regression analyses revealed that the psychological factors (self-efficacy and optimism) were more significant ($B = 3.562, p = .001$) than biomedical ($B = 0.039, p = 0.376$) and social aspects ($B = 1.155, p = 0.235$), with large effects ($f^2 = .45$). Meaning, self-efficacy and optimism (i.e. feeling confident and hopeful about aging) were stronger predictors of QoL than health and social aspects (Bowling & Liffie, 2011). A limitation to the study was that the results were taken from relatively healthy individuals to begin with and therefore, may not be generalizable to all aging adults. However, results demonstrated that psychological resources (e.g., positive emotions such as hope and optimism), which can be fostered, were better predictors of successful aging than physical health and/or social support.

Health

In a study examining health and QoL, Low and colleagues (2013) investigated the extent to which attitudes on aging mediated the relationship between health satisfaction and QoL. A secondary analysis was conducted on previously collected data utilizing cross-sectional survey

responses from the World Health Organization Field study which utilized the *World Health Organization Quality of Life Old* scale (WHOQOL-OLD). The data was collected in 2013 using convenience sampling from 20 different countries utilizing individuals ($N = 4,593$) between the ages of 60-100 to test the WHOQOL-OLD. In addition to filling out the WHOQOL-OLD, participants filled out the WHOQOL-BREF (a shortened version of the WHO QoL assessment) and the *Attitudes to Aging Questionnaire* (AAQ; Laidlaw, Power, & Schmidt, 2006) which includes three subscales: psychosocial loss, psychological growth, and physical change. A partial correlation matrix revealed health satisfaction was significantly correlated with the WHOQOL-BREF global score ($r = .632, p < .001$), and all three subscales of the AAQ: loss ($r = .350, p < .001$), change ($r = .515, p < .001$), and growth ($r = .236, p < .001$). In addition, the total mediation effect and each of the mediations through the AAQ were statistically significant (all p values < 0.01). Health satisfaction directly impacted QoL ($\beta = .38, p < .01$) and its impact was partially mediated by physical change ($\beta = .122, p < 0.01$), psychosocial loss ($\beta = 0.102, p < 0.01$), and psychological growth ($\beta = .024, p < 0.01$) across all 20 countries in the same way. Without the subscales, the effect of health satisfaction on QoL was strong ($\beta = .628, p < .01$). In other words, the results indicated that QoL was significantly impacted by participants' level of satisfaction with their health and their attitudes towards aging (e.g., psychosocial loss, physical change, and psychosocial growth). A limitation was that the population sample was skewed towards a healthier subset of aging adults. However, results indicated that satisfaction with health impacted QoL; therefore, interventions targeted at enhancing health satisfaction broadly may be beneficial to increasing overall QoL (Low, Molzahn, & Schopflocher, 2013).

In a related study, Awick and colleagues (2015) studied the effects of exercise on QoL with older adults between 60-80 years old. Participants ($N = 179$) were randomly assigned to a 12-month aerobic exercise group (e.g., walking) or a strength and flexibility group. Quality of life was measured at the start, at six months, and then again at 12 months. A two by three [(walking or strength training) by time (baseline, six months, and 12-month follow-up)] mixed model repeated measures ANOVA using general linear models to examine the effects of the interventions on QoL was used. Results indicated significant differences in group (walking or strength training) for the three time effects (baseline, six months, and 12 months) $F(2,176) = 3.11, p = .047$. Despite reaching statistical significance, the actual difference between groups was quite small (eta squared = 0.03). For instance, the walking group demonstrated a linear increase in QoL from baseline ($M = 26.01, SD = 5.28$) to six months ($M = 26.18, SD = 5.33$) to 12 months ($M = 27.17, SD = 5.14, p = 0.05$). While still significant, the strengthening and flexibility group demonstrated a linear decline in mental health from baseline ($M = 53.34, SD = 8.41$) to six months ($M = 52.67, SD = 8.50$) to 12 months ($M = 51.36, SD = 9.88, p = 0.05$). In other words, both exercise groups showed improvement from baseline in QoL over 12 months, but aerobic exercise showed slightly more benefit. A limitation to the study was that the population was relatively healthy to begin with, limiting generalizability. However, the study demonstrated that a factor such as exercise (e.g., aerobic) can increase QoL; suggesting that the more an individual engages in exercising, the higher the QoL (Awick et al., 2015).

Barriers to Quality of Life

Although previous studies have demonstrated that factors such as positive emotions and health can influence QoL, negative factors can prevent it. Variables that could become a barrier to achieving high QoL among aging adults are: depression, socioeconomic status, and cognitive health. The following sections detail the variables further.

Depression

Ní Mhaoláin and colleagues (2012) examined which factors predicted well-being among adults ($N = 466$) over the age of 65 in Ireland. Participants were given measures to assess: (a) life satisfaction, (b) personality, (c) mood and psychological well-being (i.e. depression), and (d) physical health and related variables (such as cognition, ADL, and physical activity). Bivariate analysis results showed that depression, neurotic personality traits, a higher level of comorbid illness, expressing feelings of loneliness, and disturbed sleep all correlated negatively with well-being. Stepwise hierarchical linear regression results (with an $R^2 = 0.414$) identified that depression ($\beta = -2.23$, standard error of the mean = 0.612, $p < 0.001$), loneliness ($\beta = -0.782$, standard error of the mean = 0.214, $p < 0.001$), neuroticism ($\beta = -0.182$, standard error of the mean = 0.041, $p < 0.001$), and subjective exhaustion ($\beta = -0.919$, standard error of the mean = 0.474, $p < 0.045$), were significant predictors of well-being. Limitations to the study included self-report bias and an inability to infer causal relationships between lower well-being and depression. However, the results indicated that well-being (i.e., QoL) is strongly affected by poor mental health, especially depression (Ní Mhaoláin et al., 2012).

Socioeconomic Factors

In another study to identify the determinants of QoL, Raggi and colleagues (2016) conducted an observational, cross-sectional study among individuals ($N = 5,639$) across three European countries. Data was used from individuals age 18 and up enrolled in the Collaborative Research on Aging in Europe project from 2011-2012. Eight hierarchical regression models with the following variables inputted in order were created: (a) sociodemographic (SES) variables, (b) health habits, (c) chronic conditions (e.g., depression), (d) health state descriptors, (e) vision and hearing, (f) social network index, and (f) the environment. With the significance level set at 0.05, the total variance explained by the model was 45%, and results indicated that the most relevant predictors of QoL were: (a) SES factors (17.9% variance); (b) chronic conditions specifically depression (additional 4.6% variance); and (c) social network (additional 4.6%). In addition, predictors that had a significant inverse association with higher QoL scores were depression ($B = -3.18, p \leq .001$), mild sadness ($B = -2.81, p \leq .001$), moderate sadness ($B = -3.53, p \leq .001$), and severe sadness ($B = -7.07, p \leq .001$). Results showed that in line with previous studies, depression has a negative relationship with QoL. Some limitations to the study included reporting bias, and inability to determine causality. However, the results are important because they again reveal that QoL is negatively affected by depression and/or sadness (Raggi et al., 2016).

Cognitive Health

Baernholdt and colleagues (2012) examined three dimensions of QoL in adults ($N = 911$) age 65 and older by using secondary data from the National Health and Nutrition Examination

Survey from 2005-2006. Individuals' QoL, (e.g., health-related QoL, social functioning, and emotional well-being), health behaviors (e.g., physical activity and healthcare utilization), and individual characteristics (e.g., demographics, social resources, chronic conditions, activities of daily living, and mental status) were measured. Linear regression results indicated factors that negatively impacted QoL were: (a) lower activities of daily function, (b) memory problems, and (c) depression. Specifically, poorer health-related QoL was associated with lower activities of daily functioning [$B = 0.068$ (0.01), $p < 0.001$]; memory problems [$B = 0.850$ (0.26), $p = 0.006$]; and depression [$B = 0.293$ (0.02), $p < 0.001$]. Likewise, emotional well-being was negatively associated with lower activities of daily functioning [$B = -0.011$ (0.00), $p = 0.002$]; memory problems [$B = -0.166$ (0.04), $p < 0.012$]; and depression [$B = -0.050$ (0.01), $p < 0.001$]. In other words, memory issues, depression, and inability to complete activities of daily living were good indicators of lower QoL. A limitation to the study was that results were based on individuals with no missing data. Analysis of the missing data indicated that individuals with incomplete data, had lower QoL scores. The omission of this data may have skewed the results providing a better estimate for QoL. An additional limitation was that researchers were not able to confirm if missing data was MCAR or MAR. However, the study was important as it revealed variables that could, with targeted interventions, be improved, thereby improving overall QoL (Baernholdt et al., 2012).

In a related study, Chen and Chen (2016) studied QoL determinants in a cross-sectional design among aging adults ($N = 115$) suffering from multiple chronic illnesses from Taiwan. Individuals' health status was measured by: (a) *Charlson Comorbidity index* (risk of death); (b) *Alzheimer disease 8* (AD8); (c) activities of daily living; and (d) the *instrumental activities of*

daily living scale (IADL). Pearson correlation analyses revealed that participants who were older in age had lower QoL in physiological health ($r = -0.233, p < 0.05$). In addition, overall disability risk was correlated with QoL subscales such as physiological health ($r = -0.609; p < 0.01$), psychological status ($r = -0.521, p < 0.01$), and environmental domain ($r = -0.304, p < 0.01$). Hierarchical regression analysis showed that the AD8 was the most effective predictor ($\beta = -0.280, R^2 = 0.27, p < 0.001$) of QoL and explained 27% of the variance. In addition, stepwise regression results demonstrated that risk for depression and social relations are primary factors related to QoL and explained 14% of the variance ($\beta = -0.0210, R^2 = 0.04, p < 0.01; \beta = -0.270, R^2 = 0.10, p < 0.001$). In other words, cognitive impairments such Alzheimer's or dementia, risk for depression, and social isolation are factors associated with lowered QoL. A limitation to the study was generalizability outside of Taiwan. However, the results indicated that helping aging adults bolster their mental health may influence their overall QoL (Chen & Chen, 2016).

Studies have shown that factors such as depression, cognitive health (i.e., memory issues and/or Alzheimer's disease), and SES can negatively impact QoL. Conversely, positive mental states such as optimism, self-efficacy, and feeling younger than one's actual age can significantly influence an individual's QoL. Researchers have demonstrated that how young or old individuals feel, rather than their actual age, can directly impact the degree with which individuals engage in life, which can ultimately impact overall QoL.

Subjective Age

Subjective age (SA) is defined as how old or young individuals feel relative to their chronological age (Kastenbaum, Derbin, Sabatini, & Artt, 1972; Settersten & Mayer, 1997).

Subjective age takes into consideration factors such as life satisfaction, frequency of aging signs, and an individual's beliefs and fears about aging (Montepare & Lachman, 1989). While chronological age, or actual age, is the most common measurement used to describe and study aging (Montepare, 2009; Stephen, Caudroiti, Jaconelli, & Terracciano, 2012), growing empirical research indicates aging is also a subjective experience and an important marker of development (Montepare, 2009). In fact, it has been shown that aging adults' own evaluation of their age is a better predictor of psychological functioning than their actual age (Montepare, 2009; Schafer & Shippee, 2010; Stephan, Caudroit, & Chalabaev, 2011). Moreover, successful aging studies have shown that having a younger SA promotes higher life satisfaction (Gana, Alaphilippe, & Bailey, 2004).

Subjective age has been researched since the 1950s, and studies have shown that adults report a younger SA starting at the age of 25 (Barak & Stern, 1986; Galambos et al., 2005; Staudinger, 2015). Conversely, by the time adults reach 40, a younger SA stabilizes at about 20% below actual age (Staudinger, 2015). In addition, SA has been shown to fluctuate depending on context. For instance, individuals reported younger SA when they were in better health, felt lower amounts of stress, and possessed overall positive affect (Kotter-Gruhn, Neupert, & Stephen, 2015). In contrast, individuals have reported *older* SA when they were given cognitive tests (e.g., memory and/or reading) but did not receive feedback on how they did or why the task was challenging (e.g., blurry words on a reading test; Eibach, Mock, & Courtney, 2010; Hughes, Geraci, & De Forrest, 2013; Hughes & Lachman, 2016). Moreover, participants reported an older SA when faced with just the *idea* of taking a memory test (Hughes et al., 2013). Regardless of the reason why, SA has been shown to change depending on the individual's mental state

across a diverse set of situations (Geraci, De Forrest, Hughes, Saenz, & Tirso, 2017). In addition, SA has been correlated with several aspects of QoL such as life satisfaction (including self-efficacy and physical health), cognitive health, and longevity.

Life Satisfaction and Other Variables

Westerhof and Barrett (2005) investigated the relationship between SA and life satisfaction in the U.S. and Germany. Participants between the ages of 40-74 from the U.S. ($N = 2,006$) and from Germany ($N = 3,331$) were given measures assessing: (a) SA; (b) subjective well-being, and (c) sociodemographic variables. The respondents' answers in the U.S. were taken from the MacArthur Foundation's Network on Successful Midlife Development (MIDUS) and contrasted with the respondents' answers in Germany taken from the German Aging Survey. Bivariate analyses results indicated that a younger SA was associated with greater life satisfaction ($r = .213, p < .05$), more positive affect, ($r = .204, p < .05$) and less negative affect ($r = -.241, p < .05$). After combining the results of both Americans and Germans, ordinary least-squares regression was used to determine the relationship between SA and each aspect of subjective well-being (e.g., life satisfaction and positive/negative affect). Results indicated that a younger SA was significantly related to life satisfaction ($\beta = .079, p < .001, Adjusted R^2 = .200$), positive affect ($\beta = .147, p < .001, Adjusted R^2 = .124$), and negative affect ($\beta = -.067, p < .001, Adjusted R^2 = .346$). In other words, a younger SA was associated with higher life satisfaction. Moreover, U.S. participants reported higher levels of life satisfaction than German participants. A limitation to the study was that the measures used in the MIDUS study and the German Aging survey were not designed to be compared and may have impacted the results. Despite the

limitations however, the results indicated that the adaptive value of feeling younger was used more frequently in the U.S. as compared to Germany (Westerhof & Barrett, 2005).

In another study, Stephan and colleagues (2011) identified the mediating role of subjective health and memory self-efficacy in SA. Participants ($N = 250$) between the ages of 60-77 filled out measurements related to: (a) SA, (b) subjective health, (c) memory self-efficacy, and (d) life satisfaction. Preliminary analyses indicated that correlations for SA ($r = 0.17, p < 0.01$), subjective health ($r = 0.38, p < 0.001$), and memory self-efficacy ($r = 0.24, p < 0.001$) were positively and significantly related to life satisfaction. In addition, SA was positively and significantly related to both subjective health ($r = 0.23, p < 0.001$) and memory self-efficacy ($r = 0.22, p < 0.001$). To determine if subjective health and memory self-efficacy were mediators in the model, a multiple mediators model was specified with SA as predictor, subjective health and memory self-efficacy as mediators, and life satisfaction as the criterion variable. The model yielded a satisfactory fit across indices ($X^2(2, n = 250) = 2.28, p = 0.32, TLI = 0.98, CFI = 0.99, RMSEA = 0.024 [0.00; 0.13]$). Results identified that subjective health and memory self-efficacy significantly mediated the positive contribution of a younger SA to life satisfaction. Significant paths were from: (a) SA to both subjective health ($\beta = 0.16, p < 0.01$) and memory self-efficacy ($\beta = 0.19, p < 0.01$), and (b) from subjective health ($\beta = 0.34, p < 0.001$) and memory self-efficacy ($\beta = 0.15, p < 0.05$) to life satisfaction. In addition, the model explained 19% variance of life satisfaction. In other words, results indicated that a younger SA was associated with higher life satisfaction because it was related to a positive assessment of one's health and memory ability. A limitation to the study was that the cross-sectional design prevented the researchers' from determining causal relationships between SA, subjective health, memory self-efficacy, and

life satisfaction. However, the study remains important because it revealed that SA significantly contributed to life satisfaction through subjective health and memory self-efficacy (Stephen et al., 2011).

Self-efficacy

To determine if SA could influence satisfaction with recovery after receiving surgery, Boehmer (2007) investigated the relationship between SA and perceived disability and satisfaction with recovery among cancer survivors between the ages of 24-86. Participants were patients ($N = 159$) with malignant tumors who, after receiving surgery, completed assessments at one month (time 1) and again at six months (time 2). The measures used in the study were: (a) SA; (b) perceived disability; (c) satisfaction with recovery; (d) self-efficacy; and (e) coping skills. The participants were classified into three groups, those with a younger SA (Group Y), those with the same SA and chronological age (Group C), and those with older SA (Group O). Repeated measures ANOVA results indicated that at both one month and six months, SA was significantly associated with perceived disability, ($F_{\text{TIME 1}}(2, 156) = 8.65$ and $F_{\text{TIME 2}}(2, 155) = 9.80$, $ps < .001$) and satisfaction with recovery, ($F_{\text{TIME 1}}(2, 156) = 11.50$ and $F_{\text{TIME 2}}(2, 155) = 7.90$, $ps \leq .001$). In other words, how old people feel is significantly associated with their perception of recovery and how able-bodied they feel after surgery. To isolate the differences, bonferroni post hoc multiple comparison tests and standardized mean differences demonstrated that at both one and six months after surgery, Group Y reported significantly and/or meaningfully lower disability after surgery than Group C (Time1, $|d| = -0.41$, $p \leq .10$; Time2, $|d| = -0.22$) with small to medium effect; and higher satisfaction with recovery at six months than

Group C (Time₁, $|d| = 0.26$) with small effect. Further, Group Y reported significantly lower disability (Time₁, $|d| = -1.05$, $p \leq .10$; Time₂, $|d| = -1.12$, $p \leq 0.01$) and higher satisfaction (Time₁, $|d| = 1.24$, $p \leq 0.01$; Time₂, $|d| = 1.00$, $p \leq 0.01$) than Group O with large effect. In addition, SA was associated significantly with self-efficacy at both time intervals, ($F_{\text{TIME 1}}(2, 155) = 4.43$, $p = .01$, and $F_{\text{TIME 2}}(2, 155) = 3.48$, $p = .03$). Bonferroni post hoc multiple comparison tests demonstrated that Group Y reported higher self-efficacy than group C (Time₁, $|d| = -0.15$; Time₂, $|d| = 0.22$) and Group O (Time₁, $|d| = 0.61$; Time₂, $|d| = 0.67$, $p \leq .05$) with small and medium effect. Therefore, the results demonstrated that possessing a younger SA or a SA that is the same as actual age was associated with higher levels of self-efficacy, greater satisfaction with recovery, and higher life satisfaction. A major limitation to the study was the broad range of ages among participants; therefore, the results are difficult to generalize to an aging population. In addition, the measure for SA used a single item question, (e.g., “*how old do you feel?*”) without using proportional discrepancy scores (only discrepancy scores were used) and did not utilize an additional multidimensional construct such as the Cognitive Age Scale (CAS: Barak, 1979; Barak & Schiffman, 1981). Despite these limitations, the results indicated an association between how old individuals feel and their recovery time after surgery. In addition, the results indicated that feeling younger than one’s actual age influences how much control (i.e., self-efficacy) individuals believe they have over their life (Boehmer, 2007).

Physical Health

Promoting physical activity among aging adults is a public health concern as remaining physically active can increase muscle mass and prevent bone loss, reducing the risk of falling

(National Council on Aging, 2017). Moreover, an estimated 30 billion dollars is spent annually on treating adults for issues related to slipping and falling, a figure that is expected to increase to 60 billion dollars by 2020 (National Council on Aging, 2017). Therefore, SA and the *intention* to engage in physical activity with self-efficacy as a mediator, was investigated (Caudroit, Stephan, Chalabaev, & Le Scanff, 2012). Participants ($N = 170$) aged 60-80, who were also members of a sport retirement organization completed several measures to assess: (a) physical activity intention, (b) self-efficacy, (c) SA, (d) self-rated health, and (e) past physical activity. Structural equation modeling (SEM) was used to analyze the path-analytic model with SA, health, actual age, and past activity as the predictors, self-efficacy as the mediator, and physical activity intention as the criterion. Physical activity intention explained 44% of the variance and self-efficacy explained 24% of the variance. Significant paths were from SA to self-efficacy ($\beta = .20, p < .01$) and from self-efficacy to physical activity intention ($\beta = .36, p < .001$). Subjective age was also significantly related to physical activity intention [with self-efficacy excluded ($\beta = .26, p < .01$); with self-efficacy included ($\beta = .20, p < .01$)] and chronological age ($\beta = .20, p < .001$). Structural equation modeling results indicated that self-efficacy may be a significant partial mediator of the relationship between SA and intention to engage in physical activity, while controlling for actual age, self-rated health, and past activity. In other words, the younger individuals felt, the more self-efficacy they had to engage in physical activity. Several limitations to the study included generalizability (members of an athletic club may be more physically active than other aging adults), as well as the fact that the study was comprised of several one to two item instruments. Despite these limitations, the study remains significant because it demonstrated a relationship between SA and determinants of physical activity, namely intention, as well as

supports the theory that SA is a correlate of self-efficacy (see Boehmer, 2007; Infurna et al., 2010; Schafer & Shippee, 2010). Furthermore, the researchers assert that a younger SA increases the intention to engage in physical activity which may lead to more physical engagement, and thereby enhance overall health and subsequently, QoL for the aging adult (Caudroit et al., 2012).

In a follow-up study to determine if SA influenced *actual* physical activity, Stephan and colleagues (2013) tested whether it was possible to induce a younger SA in individuals to increase physical activity through a handgrip task. Participants ($N = 49$) between the ages of 52-91 completed measures on: (a) self-rated health, (b) SA, and (c) handgrip strength. Participants were randomly assigned into experimental and control groups, with both groups participating in the handgrip task as a baseline measure. The experimental group, at baseline, were told they tested higher than 80% of their peers, whereas individuals in the control group did not receive any feedback regarding their handgrip test results (Stephan, Chalabaev, Kotter-Gruhn, & Jaconelli, 2013). Independent sample t tests revealed no significant difference in baseline SA, $t(41) = 0.13, p = .89$, or grip strength $t(41) = 0.31, p = .76$ between groups, indicating baseline equivalence. Participants were then given assessments to complete and engaged in the handgrip task again. Mixed measures analysis of variance results indicated a significant group-by-time interaction (control group versus experimental group by manipulation at baseline and post manipulation), $F(1,41) = 5.54, p = .02; \eta^2_p = 0.12$. Moreover, participants in the experimental group who received favorable social comparison reported younger SA from baseline 7.9% ($M = 0.079, SD = 0.08$) to post-manipulation 11% ($M = 0.110, SD = 0.08$) versus the control group from baseline 7.5% ($M = 0.075, SD = 0.07$) to post-manipulation 7.9% ($M = 0.079, SD = 0.08$). Results indicated that participants could be made to feel younger. Furthermore, grip strength

showed a significant group-by-time interaction, $F(1,41) = 8.61, p = 0.005, \eta^2_p = 0.17$. Grip strength increased in the experimental group from baseline ($M = 24.98, SD = 7.62$) to post manipulation ($M = 26.02, SD = 7.64$) versus the control group which lowered slightly from baseline ($M = 24.21, SD = 8.71$) to post manipulation ($M = 23.53, SD = 9.22$). Results indicated that a younger SA can lead to increased grip strength. Limitations to the study included a small sample with a wide range of ages (52-91), predominantly comprised of females. However, the results demonstrated that a younger SA may have the ability to increase physical strength (Stephan et al., 2013).

Cognitive Health

According to the Center for Disease Control, one in eight adults over the age of 60 have reported experiencing confusion or memory loss over the last 12 months (Alzheimer's Association and Center for Disease Control and Prevention, 2013). In the State of Florida, over 500,000 aging adults have a memory-related disorder, and with individuals living longer, this number is expected to grow (Department of Elder Affairs, State of Florida, 2011). Since the average 65-year-old living today will continue to live an additional 20 years longer than earlier cohort members (Administration on Aging, 2016), risks of mild and other cognitive impairments will continue to increase. As a result, several researchers have studied SA and its relation to cognitive decline.

Stephen and colleagues (2014) examined whether SA was associated with cognitive functioning. Data was used from two waves of the MIDUS survey from 1994-1995 (wave 1) and then again from 2004-2006 (wave 2). Participants ($N = 1,352$) were between the ages of 50-75

and completed measurements on: (a) SA, (b) body mass index, and (c) physical activity. In addition, SA was taken at baseline with cognitive measures that evaluated episodic and executive functioning. Results indicated that a younger SA correlated with superior performance on both episodic memory ($r = 0.06, p < 0.05$) and executive function tests ($r = 0.06, p < 0.05$).

Regression analysis results demonstrated that after accounting for actual age, sex, education, and BMI, SA was a significant predictor of episodic memory with small effect size ($\beta = 0.05, Adjusted R^2 = 0.002, p < 0.05$), and executive function with small effect size 10 years later, ($\beta = 0.05, Adjusted R^2 = .002, p < 0.05$). In other words, results indicated that a younger SA was associated with better cognitive functioning 10 years later. Limitations to the study included generalizability (e.g., healthier population sample was used), and the fact that variables such as social support, depressive symptoms, medications, or perceived health were not controlled. Despite these limitations, the results indicated that how old or young individuals feel can significantly contribute to cognitive health and performance (Stephen, Caudroit, Jaconelli, & Terracciano, 2014).

In a related study, Stephen and colleagues (2016) examined data from the Health and Retirement Study (HRS), a longitudinal multi-wave study, to investigate SA and memory. Over a four-year span, participants ($N = 5,809$) completed measures on SA, demographic factors, memory, depressive symptoms, and physical activity. To assess for memory decline, participants had to recall a list of 10 words immediately after hearing them, and then again after five minutes of answering other survey questions. After controlling for demographics, BMI, and health factors, results from regression analyses revealed that a younger SA was associated with better immediate recall ($\beta .04, Adjusted R^2 = 0.35, p < .001$), delayed recall ($\beta = .03, Adjusted R^2 = 0.38,$

$p < .01$), and composite memory ($\beta = .04$, *Adjusted R*² = 0.42, $p < .01$) with large effect sizes four years later. Results indicated that one standard deviation of feeling younger was associated with 1.87 fewer years of aging on immediate recall, 1.32 fewer years of aging on delayed recall, and 1.48 fewer years of aging on total memory changes. The study confirmed Stephen et al.'s 2014 findings that SA contributed to cognitive health and performance, specifically that a younger SA was associated with higher immediate recall, delayed recall, and less memory decline. A limitation of the study was that it only focused on one aspect of cognitive functioning, memory. However, despite those limitations, the results demonstrate an association between a younger SA and an aspect of cognitive aging (Stephen et al., 2016).

Along similar lines, Schafer and Shippee (2010) examined whether feeling older was associated with more pessimistic views about cognitive aging. Data was taken from the MIDUS dataset at baseline (1995-1996) and 10 years later in 2005. Participants ($N = 496$) between the ages of 55-74 were assessed for cognitive aging dispositions (attitudes about changes in performing cognitive tasks) and SA. Linear regression analysis results demonstrated, with medium effect size (*Adjusted R*² = 0.276), that women with an older SA ($B = -0.155$, $SE = 0.062$, $p < .05$) and those with negative affect ($B = -1.699$, $SE = 0.815$, $p < .05$) were more pessimistic towards cognitive aging versus those who had more education ($B = 0.480$, $SE = 0.212$, $p < .05$) and greater sense of control ($B = 1.762$, $SE = 0.567$, $p < .01$). In other words, participants who had an older SA were more pessimistic about aging. Limitations to the study included generalizability as ethnic minorities were not well represented, and an exclusion of memory measures (e.g., puzzles or memory tests) in the dataset to determine how SA affected cognitive performance. However, the results indicated that among women, SA strongly shaped outlooks on

cognitive abilities, indicating that SA impacts cognitive aging as much if not more than actual age (Schafer & Shippee, 2010).

Longevity Studies

Researchers have shown that individuals who possess a younger SA have also lived longer than their peers who have an older SA. Markides and Pappas (1982) investigated the predictive ability of subjective health and SA in a four-year longitudinal study with data collected in 1976 (baseline), and again in 1980. At baseline, 510 Mexican and Anglo-American men and women 60 years and older answered questions related to subjective and objective health, SA, and were given actuarial life expectancy values (using tables developed by the National Center for Health Statistics) based on their age and gender. Four years later, participants ($N = 338$) were followed-up with and re-assessed. Stepwise Discriminant Function Analysis indicated that of eight variables measured (subjective health, objective health, SA, life expectancy, ethnicity, marital status, years of school, and socioeconomic status), only three contributed significantly to the prediction of survivorship. The three variables were: (a) subjective age ($\beta = 0.545$, Change of Rao's $V = 24.40$, $p = 0.001$); (b) life expectancy ($\beta = -0.535$, Change of Rao's $V = 14.44$, $p = 0.001$); and (c) objective health ($\beta = 0.508$, Change of Rao's $V = 13.12$, $p = 0.001$). Furthermore, results indicated that SA was the best predictor of survivorship. Study limitations included generalizability (two ethnic groups were sampled) and a lack of specificity (details regarding methods were sparse). However, the study remains significant as it was one of the first to examine the predicative ability of SA and longevity (Markides & Pappas, 1982).

In a related study, Uotinen and colleagues (2005) investigated SA as a potential predictor of mortality in a longitudinal study using proportional hazards regression. As an aside, proportional hazards regression (or Cox regression) is frequently used for survival analysis and is a semi-parametric regression technique that yields hazard, incidence, or mortality rates and describes the differences in survival times (Nieto & Coresh, 1996; Zwiener, Blettner, & Hommel, 2011). To put it simply, Albarqouni (2016) described a hazard rate as referring to the length of time it takes for an outcome (e.g. death) to occur. In addition, a hazard ratio (HR), is the ratio of incidence rates, and relative risk (RR) is the ratio of the probability of the event occurring. As such, Uotinen and colleagues (2005) investigated SA, health, and depression at two-time intervals (baseline and 13 years later) using Finnish participants ($N = 1,165$) between the ages of 65-84. Participants were divided into three groups according to their baseline SA (e.g., younger SA, similar SA/actual age, older SA). For both males and females, there were higher mortality rates in the older SA category than in the other two categories. Proportional hazard regression models were used and after controlling for age, gender, education, diseases, and self-rated health, an older SA versus a younger SA was found to be a significant predictor of mortality [$RR = (1.56 (95\% \text{ CI } 0.92 - 1.31), p = 0.046$]. In addition, similar SA/actual age versus younger SA was found to also be a significant predictor of mortality [$RR = (1.10 (95\% \text{ CI } 0.92-1.31), p = 0.046$]. However, after controlling for cognitive status ($p = 0.046$) and mood ($p = 0.360$), the relationship between SA and mortality was no longer significant. In other words, a potential association between SA and mortality could be explained by an increased risk of dementia. A limitation to the study was generalizability to aging adults outside of Finland.

However, the study demonstrated that an older SA may be a warning sign of worsening health among aging adults (Uotinen, Rantanen, & Suutama, 2005).

In summary, SA is beneficial because it has been shown to positively contribute to well-being, physical activity, life satisfaction, slower cognitive decline, and an increase in longevity. Although SA is important in the field of gerontology, the goal is not to find ways in which to help an individual feel younger, rather the goal is to help individuals from feeling older (Geraci et al., 2017). Playfulness, a variable that has the potential to not only contribute to healthy aging, but may prevent an individual from feeling older, has yet to be studied in relation to SA.

Playfulness

While the quality of playfulness (PF) is as old as play itself, scientific research regarding PF is relatively new (Gordon, 2014). In fact, most research on PF has focused on children and adolescents, with limited scientific inquiry among adults, especially aging adults (Proyer, 2014). Given that researchers believe that PF is an important variable of both cognitive functioning and emotional growth, two characteristics that contribute to healthy aging, further research is warranted on PF with aging adults (Fredrickson, 1998).

Definition and Characteristics of Playfulness

Playfulness has been defined as “an individual differences variable that allows people to frame or reframe everyday situations in a way such that they experience them as entertaining, and/or intellectually stimulating, and/or personally interesting” (Proyer, 2015, p. 93-94). In addition, individuals with high amounts of PF look for and establish situations where they can:

(a) engage others in a playful manner (e.g., joking and teasing); (b) use their PF to resolve tensions (e.g., playfully reducing tension); and (c) may demonstrate spontaneity, impulsiveness, energy, happiness, and socialability (Proyer & Wagner, 2015; Barnett, 2007). Sicart (2014), a computer game researcher, further elaborated on the definition of PF by saying:

What we want is the attitude of play without the activity of play. We need to take the same stance toward things, the world, and others that we take during play. But we should not play; rather, we should perform as expected in that (serious) context and with that (serious) object. We want play without play. We want playfulness—the capacity to use play outside the context of play. (p. 21)

The Mindset of Playfulness

There are several theories regarding PF as either a personality trait, a characteristic of healthy development, or a mindset. In fact, most studies use the premise that PF is a personality trait by describing it as being an internal disposition (Shen et al., 2014a) or a measurable integrated personality trait (see Glynn & Webster, 1992; Lieberman, 1977; Proyer & Wagner, 2015; Schaefer & Greenberg, 1997). However, Gordon (2014) suggested that PF is not a trait, but rather a characteristic of a securely attached child. Gordon argued that PF was a life-long outcome of secure attachment, and that to restore PF in adults, repairing ruptured attachments would be necessary. Conversely, other researchers have put forward the idea that PF is really an outlook that allows individuals to perceive challenges as opportunities to enhance and grow (Waldman-Levi et al., 2015). Moreover, Guitard and colleagues (2005) defined PF as a state of mind that is comprised of: (a) creativity, (b) curiosity, (c) sense of humor, (d) pleasure, and (e)

spontaneity. Furthermore, Sicart (2014) stated that the main difference between play and playfulness was that play was the activity, while playfulness was an attitude. Therefore, for the current study, PF is considered an outlook or mindset and not a trait.

History of Playfulness

The first PF assessment was developed by Lieberman in the 1960s. It was designed for adults to assess PF in children. In the first PF study, Lieberman studied 93 kindergarteners in three different schools (Lieberman, 1966, 1977). Lieberman used three measures: (a) *The Playfulness Scale* (Lieberman, 1965), (b) tasks to measure divergent thinking, and (c) an intelligence test. Correlation analysis results indicated correlations between aspects of PF (e.g., physical, social, cognitive spontaneity, manifest joy, and sense of humor) and divergent thinking tasks (e.g. ideational fluency, spontaneous flexibility, and originality). Results showed that ideational fluency (ranges of $r = .29$ to $.36$, $p < .005$), spontaneous flexibility (ranges of $r = .19$ to $.26$, with $p < .05$, $.01$, and $.005$), and originality (ranges of $r = .21$ to $.25$, with $p < .05$, $.01$, and $.005$), were statistically significant correlations with PF. In other words, children who were more playful did better on divergent thinking tasks.

Barnett (2007) worked with undergraduate college students ($N = 649$) between the ages of 18 and 30 across three different universities to determine if PF could be defined as a psychological construct. Focus groups of 6-10 students yielded 42 adjectives that were later paired down to 15 (e.g., *active, adventurous, cheerful, clowns around, energetic, friendly, funny, happy, humorous, impulsive, jokes/teases, outgoing, sociable, spontaneous, and unpredictable*). Based off the descriptors, Barnett was the first to provide a definition of PF, defined as: “the

predisposition to frame (or reframe) a situation in such a way as to provide oneself (and possibly others) with amusement, humor, and/or entertainment” (Barnett, 2007, p. 955). Although Barnett’s definition is the most cited, a limitation is that it undervalues the significance of PF, by relegating it to amusement and/or entertainment purposes only. However, Barnett’s study remains an important contribution to the study of PF, as she was the first to provide researchers a way to define and lay the groundwork for future measurements of PF with adults.

Importance of Playfulness

Empirical studies have shown that PF facilitates healing, improves morale, and increases motivation (Auerhahn & Laub, 1987). In addition, PF has been associated with creativity which can aid an individual in problem solving (Tegano, 1990). Moreover, individuals who are playful tend to view challenges as opportunities to learn and increase competencies and skills (Waldman-Levi et al., 2015). As such, PF has been linked to better stress management, selecting romantic partners, and overall life satisfaction.

Stress Management

Magnuson and Barnett (2013) examined PF and its relation to stress and coping styles among college students ($N = 898$) between the ages of 18-27. Students were given measures that assessed: (a) playfulness, (b) perceived stress, and (c) coping styles and were divided into three groups of PF. The three groups were comprised of: low levels of PF (scores of 6.87 or lower), medium levels (scores of 7.00-7.87), and high levels of PF (scores above 8.00). Analysis of variance results demonstrated a significant main effect [$F(2,592) = 9.40, p < .001$]. Sidak post hoc tests indicated that the students in the low PF group ($M = 2.00, SD = .38, p < .001$) reported

higher levels of perceived stress than those in the medium PF group ($M = 1.87, SD = .43, p < .001$) and high PF group ($M = 1.85, SD = .34, p < .001$). Results of the MANOVA yielded a significant multivariate main effect [$F(28,1696) = 4.62, p < .001$]. Univariate ANOVA tests were run with each coping style and results indicated that the low PF group reported less use of coping skills ($M = 5.97, SD = 1.14; M = 5.83, SD = 1.29$) than both the medium PF ($M = 6.34, SD = 1.06; M = 6.13, SD = 1.22$) and high PF ($M = 6.48, SD = 1.20; M = 6.29, SD = 1.21$) groups. In addition, follow-up univariate ANOVA's revealed a significant playfulness group effect for active coping [$F(2,862) = 14.63, p < .001$], acceptance [$F(2,862) = 10.25, p < .001$], and positive reframing [$F(2, 862) = 24.09, p < .001$]. Moreover, the coping skill of positive reframing increased as PF increased $F(2,862) = 24.09, p = .001$ (Magnuson & Barnett, 2013). In summary, the results demonstrated that young adults who were playful experienced lower levels of perceived stress and utilized adaptive coping styles more frequently than their less playful peers. A limitation to the study was generalizability as the study was comprised of college students. Despite the limitations, results demonstrated that PF is a variable that gives an individual under stress an advantage. The results identified that individuals who are more playful, utilize coping skills more frequently, and as a result tend to view stressors as manageable rather than overwhelming (Magnuson & Barnett, 2013).

Romantic Relationships

Chick and colleagues (2012) were the first to study the role of PF in romantic relationships among American young adults. The researchers replicated, in part, a previous study conducted by Bus and Barnes (1986) that identified 13 characteristics (e.g., *kind and*

understanding, exciting personality, intelligent, physically attractive, healthy, easygoing, creative, wants children, college graduate, good earning capacity, good heredity, good housekeeper, religious), individuals may prefer when seeking a future mate. To investigate the importance of PF, Chick and colleagues added three playful descriptors to the study (e.g., *fun loving, sense of humor, and playful*). The researchers hypothesized that the playful characteristics would rank in the upper half of what young adults found attractive in a potential mate. Undergraduate students ($N = 254$) between the ages of 18-26 were asked to rank the listed characteristics from 1-10 with 1 as “not at all desirable” and 10 as “extremely desirable.” Results indicated that in overall rank order, *sense of humor* ranked first, *fun loving* third, and *PF* fifth. In addition, to demonstrate that their sample was similar to Buss and Barnes, Chick and colleagues correlated the rank order of the original 13 traits using Spearman’s *rho*. The correlation between Buss and Barnes’s total sample and their total sample was .83, indicating that the two groups ranked the 13 preferences similarly (Chick, Yarnal, & Purrington, 2012).

Several years later, Proyer and Wagner (2015) replicated Chick and colleague’s study using a German population. Study participants were undergraduate and graduate students ($N = 327$) ranging in age from 18-44. Overall rank order for the German students showed that *kind and understanding* ranked number one, followed by *intelligent*, and *sense of humor*. *Fun loving* ranked as number 4 with *PF* as number eight. Proyer and Wagner demonstrated that the playfulness descriptors ranked in the upper half of the 16 characteristics which closely replicated Chick and colleague’s findings (Proyer & Wagner, 2015). A limitation to both studies conducted by Chick and colleagues (2012) and Proyer and Wagner (2015) was that the playful characteristics being studied may just be a preference among young adults, the study results do

not suggest actual choice made by participants. Furthermore, sexual orientation was not reported so understanding the rankings of preferences in terms of same or opposite sex relationships was unknown. However, both studies demonstrated that in theory, PF and its components of humor and fun, may be important variables when selecting a partner (Chick et al., 2012; Proyer & Wagner, 2015).

Life Satisfaction

Proyer (2013) expanded the study of PF to determine if it related positively to subjective and physical well-being. Adults ($N = 255$) between the ages of 18-67 years of age were given measurements to assess for: (a) playfulness, (b) health (e.g., active way of life, compliance, substance avoidance, security orientation, diet, and hygiene), (c) physical fitness, and (d) satisfaction with life. A multiple correlation coefficient was used between all components of the PF scale (e.g., spontaneous, expressive, fun, creative, and silly) and remaining variables. Results indicated a positive relationship between PF and an active way of life ($r = .22, p < .01$) and PF with life satisfaction ($r = .20, p < .01$). In addition, a hierarchical multiple regression analysis indicated that significant predictors of PF were an active way of life ($\beta = .27, p < .001, \Delta R^2 = .07$) and substance avoidance ($\beta = .16, p < .05, \Delta R^2 = .02$). Mediator analysis suggested that an active way of life partially mediated the relationship between PF and life satisfaction. A limitation to the study, was generalizability, as the participants were from Germany and not balanced in terms of age and gender. However, Proyer's study indicated a relationship between physical activity, PF, and life satisfaction (Proyer, 2013).

In summary empirical studies have shown that for young to middle aged adults, PF is a construct that has been shown to help individuals manage stress by influencing the way they see stress and utilize coping skills. Furthermore, PF may influence how individuals select romantic partners and enhance overall life satisfaction. In addition to the findings described above, researchers have also demonstrated that PF may be beneficial to aging adults' health and QoL. Moreover, studies have demonstrated that PF in later life impacts healthy aging by improving cognitive, emotional, social, and psychological functioning (Yarnal & Qian, 2011).

Healthy Aging

Researchers in the field of gerontology have changed the focus from avoidance of age-related decline to the promotion of healthy aging. As such, one component that promotes healthy aging is maintaining and/or enhancing emotional well-being (Kryla-Lighthall & Mather, 2009). When it comes to studying emotional well-being among aging adults, a variable that should be included is PF. Playfulness has been linked to resiliency, humor, and happiness and positive emotions among older adults.

Resiliency

Two qualitative studies regarding the role of play and PF in the lives of retired women in the Red Hat Society (RHS) were conducted in 2006 and again in 2008 (Yarnal 2006; Yarnal, Chick, & Kerstetter, 2008). Both studies demonstrated that members of the RHS felt good about aging because they had an outlet that allowed them to be playful. In their own words, women described that they did not get the chance to be playful when they were younger, so being a part of the RHS provided them an environment in which they could play and be playful, thereby

helping them feel younger and better about themselves (Yarnal, 2006; Yarnal, Chick, & Kerstetter, 2008).

Several years later, Chang and colleagues (2016) conducted a longitudinal study to investigate if resilience was strengthened by PF among members of the RHS ($N = 167$) aged 50 and older. Every month for 12 months, participants would engage in an online survey. Participants answered measures that included: (a) self-reported health, (b) PF, (c) resilience, and (d) demographic factors. Descriptive statistics results indicated moderate baseline resilience ($M = 3.87$ on a 1-to-5 scale, $SD = 0.315$) which significantly correlated with mental health. For instance, women who reported high levels of mental health also reported higher levels of resilience ($r = .43, p < .01$). In addition, both resilience and PF increased slightly across the 12 waves of data collection. Resilience increased from $M = 2.37$ to $M = 3.30$ and PF increased from $M = 97$ to $M = 104$. Moreover, a multilevel model was used to determine if PF contributed to the participants' resilience. The results indicated that increases in PF had a significant effect on increases in resiliency ($\gamma_{01} = 0.002, p < 0.05$). In other words, PF was a significant predictor of resilience. Moreover, individuals with higher mean levels of PF also reported higher mean levels of resilience. Results of this study indicate that PF can facilitate resilience among aging women in the RHS (Chang, Yarnal, & Chick, 2016). A major limitation to the RHS studies was generalizability. As the RHS is a leisure group for women only, these results may not be generalizable to men or women from diverse backgrounds outside of the RHS. Despite those limitations the results should not be minimized. The RHS studies have provided voices to describe the aging process and how important play and being playful is to older adults' well-

being. Although further studies need to be conducted, preliminary results from Chang and colleagues indicates that PF may facilitate resilience in aging adults.

Humor

Another coping skill that can enhance resiliency and is related to PF, is humor. Although there are arguments that PF and humor are the same, others view both constructs as different but ultimately related to one another. As such, PF has been described as the basis for humor as it represents the ability to play with ideas (McGhee, 1996). Therefore, to examine the association between PF, humor styles, and subjective happiness, Proyer and colleagues (2010) investigated sense of humor, mood, and PF with individuals ($N = 979$) between the ages of 18-74. Special focus was given to participants over the age of 50. Participants completed the *Sense of Humor Scale* (SHS; McGhee, 1996) which consists of three factors: (a) playfulness versus serious attitude, (b) positive versus negative mood, and (c) sense of humor. The total sample was divided into five groups and the means and standard deviations were calculated for each group. Results indicated that individuals who reported meeting with friends more than once a week, scored higher in PF, positive attitude, and sense of humor than those who did not meet with friends. The results were as follows: (a) playfulness with large effect [those who met with friends $t(230) = 3.78, p < 0.01; M = 4.93; [SD = 0.78]$ versus those who did not meet with friends $M = 4.45 [SD = 0.72]; d = 0.63$]; (b) positive attitude with large effect [those who met with friends $t(230) = 4.51, p < 0.01; M = 4.90 [SD = 0.97]$ versus those who did not $M = 4.13 [SD = 1.21]; d = 0.75$]; and (c) sense of humor with medium effect [those who met with friends $t(230) = 2.01, p < 0.05; M = 16.84 [SD = 3.32]$ versus those who did not $M = 15.77 [SD = 2.89]; d = 0.33$]. In addition, the

International Well-Being Index (Renn et al., 2009) was used to correlate the results from each age group. Pearson correlation coefficients revealed a playful frame of mind appeared to contribute to personal well-being in aging adults ($r = .30, p < 0.01$). In addition, a higher correlation was found for the relation between positive mood and higher personal well-being ($r = .40, p < 0.01$). Moreover, greater dissatisfaction with national well-being was experienced by those who did not use humor under stress (median $r = -0.33$), and by those unable to find humor in everyday life (median $r = -0.32$). Results indicated that humor and PF appear to remain stable and that a higher engagement in social activities may promote well-being among aging adults (Proyer, Ruch, & Müller, 2010). A limitation to this study was that it has not been replicated on a larger scale, nor was the data longitudinal.

Happiness and Positive Mood

To better understand PF and its relationship with aging adults, Proyer (2014) studied individuals ($N = 4,100$) aged between 18-92 years of age. The sample was broken up into 11 age groups. Individuals were given measures that assessed: (a) playfulness, (b) orientation to happiness, (e.g., pleasurable life, engaged life, and meaningful life), and (c) authentic happiness. Analysis of variance was used to discover differences in PF across the age and post hoc tests indicated that those younger than 40 years of age had higher PF scores than all other groups. Effect sizes ranged from $d = 0.24$ (18-25 versus 66-70) to 0.45 (18-25 versus 46-50). In addition, participants between 66-70 had higher PF than those 46-50 ($d = 0.22$). Although the range of mean scores may have fluctuated among age groups, all groups had mean scores for PF around the midpoint of the scale, thereby indicating that in different degrees, PF was prevalent across

the lifespan. In addition, multiple regression results indicated that the pleasurable life ($\beta = 0.25, p < 0.001$) was the best predictor of PF. Further, Pearson correlations indicated that PF was positively correlated with happiness ($r = 0.16, p < 0.01$) and with the pleasurable life ($r = 0.28, p < 0.01$). Results indicated that PF appears across the lifespan and is related to different components of happiness (Proyer, 2014). A limitation to this study was that the group sizes were unequal with a wide span of ages. Despite the limitations, Proyer's study demonstrated that PF has a relationship with happiness, which can help facilitate well-being (Fredrickson, 1998, 2001). Additionally, the results of Proyer's study created more questions to be investigated in relation to PF, aging adults, and well-being. In summary, PF is beneficial because it has been shown to positively contribute to coping skills, preference in mate characteristics, and correlate with happiness, humor, and resilience among aging adults. Conversely, depression has been shown to negatively impact mental health and life satisfaction.

Depression

Depression is the leading cause of disability worldwide, and as a result contributes to the overall global burden of disease (World Health Organization, 2017). Within the U.S., depression has been linked to heart disease, already one of the leading causes of death for Americans (Kiecolt-Glaser, McGuire, Robles, & Glaser, 2002). In general terms, depression has been defined as an emotional state of enduring sadness ranging from mild discouragement and gloominess to feelings of extreme despair, often accompanied by irritability, restlessness, or difficulty remembering (Center for Disease Control and Prevention, 2017; Corsini, 2002). According to the Center for Disease Control (CDC), older adults are at an increased risk for

depression because it is more common among individuals who suffer from adverse health conditions, and approximately 80% of older adults have at least one chronic health condition, and 50% have two or more illnesses (Center for Disease Control and Prevention, 2017).

Furthermore, depression is overlooked in the aging adult population due to how it presents itself. The symptoms of depression may appear different in older adults and may mirror cognitive impairments such as failing memory, concentration, and slower cognitive processing speed (Fiske, Wetherell, & Gatz, 2009; Murayama et al., 2016). Due to its symptomology, depression can often remain undiagnosed which can lead to worsening symptoms (Fiske et al., 2009). Moreover, aging adults themselves are not always aware of when they are depressed. In a qualitative study, Overend and colleagues (2017) conducted 33 interviews with doctors, case managers, and adults 65 and older who were diagnosed with depression. After a team transcribed and analyzed the data, a main theme that emerged was that participants experienced hidden depression. The results of the study also revealed that for some aging adults, admitting they are suffering from depression was difficult because it carried a stigma. One of the participants described the Boomer generation as not being as open about depression as younger generations and stressed the importance of normalizing depression so that individuals receive necessary help (Overend et al., 2017). In summary, depression has been shown to negatively impact health, increase the risk for mortality, bias perceptions, and impact social support.

Negative Health Implications

Left untreated, depression can impact more than morale and self-efficacy, it can negatively impact health and recovery after health ailments. Lenze and colleagues (2004)

examined the effects of depression and cognitive impairment in hip fracture patients receiving rehabilitation. Participants ($N = 57$) were adults over the age of 60 who had a hip fracture and were admitted to a university rehabilitation hospital. Participants were given measurements that assessed for: (a) depression, (b) cognition, and (c) rehabilitation outcomes (e.g., functional independence). Pearson correlations revealed that higher depression scores were significantly correlated with poorer rehabilitation participation ($r = -0.46, p < 0.001$), greater length of stay at the rehabilitation center ($r = 0.57, p < 0.001$), and lower rehabilitation change over time ($r = -0.44, p < 0.001$). In addition, multiple regression was utilized to determine predictors of poorer rehabilitation outcomes. Results from the full regression model ($F_{3,45} = 11.3, p < 0.0001$) indicated that rehabilitation participation ($\beta = 0.33, t = 2.4, p = 0.02$) mediated the relationship between cognitive impairment ($\beta = 0.31, t = 2.4, p = 0.02$) and to a smaller amount, depression ($\beta = -0.19, t = -1.6, p = 0.12$). In other words, the results indicated that patients with higher rates of depression and/or cognitive impairment had poorer outcomes in rehabilitation because they were not able to participate as well in their sessions. Limitations to the study included a small sample size and lack of statistical evidence that treatment for depression improved rehabilitation outcomes. However, the results remain significant because they demonstrated depression can negatively impact a person's physical ability to recover from something such as surgery (Lenze et al., 2004).

In another study, Lee (2013) examined the association between physical activity (e.g., gardening, walking, and exercise through sports) and mortality, as well as the potential modifying effect of depressive symptoms on the relationship between physical activity and mortality. Data was taken from the 4th wave of the *Americans' Changing Lives* study and was

comprised of individuals ($N = 624$) over the age of 65 who were assessed for depression. After adjusting for gender, age, race, education level, income, marital status, and smoking, logistic regression results identified that individuals who reported, “often” engaging in gardening and walking had reduced odds of mortality by 77% and 83% (adjusted odds ratio = .23 and .17, 95% CI = .09-.59, $p = .002$ and 95% CI = .07-.41, $p = .000$) as compared to those who reported, “never” gardening. Exercise through sports was not a significant predictor of mortality. In other words, individuals who often engaged in gardening and walking had a lower risk of later mortality six years later. However, after introducing the interaction terms of gardening and walking with overall depressive symptoms, they were no longer a significant protective factor for mortality (gardening: parameter estimate = $-.03 \pm .62$, $p = .958$; walking: parameter estimate = $.04 \pm .57$, $p = .948$). The results prior to introducing the interaction terms were gardening $.40 \pm .13$, $p = .003$ (adjusted) and walking $.54 \pm .13$, $p = .000$ (adjusted). In other words, increased depressive symptoms *reduced* the protective factors of physical activity. Limitations to the study included lack of specificity for time periods for physical activity, leaving participants to differentiate for themselves what “often” and “sometimes” meant. However, the results of the study demonstrated the powerful impact of depression and how it can negate important benefits from activities such as walking and/or gardening (Lee, 2013).

Increased risk for Mortality

Depression not only diminishes the protective factors for mortality, but it can also increase the risk *for* mortality. Whooley and Browner (1998) investigated whether depressive symptoms, detected from a routine healthcare visit or a simple diagnostic questionnaire could

predict mortality. A prospective cohort study comprised of women ($N = 7,518$) over the age of 67 were followed for up to six years. In addition, the participants completed measures for: (a) depression, (b) physical activity, and (c) demographics. After adjusting for marital status, education, alcohol use, physical activity, social support, medication, and BMI, results of stepwise proportional hazards regression indicated that participants who had six or more depressive symptoms had almost a 1.5 increased risk of death ($HR = 1.47$; 95% CI = 1.14-1.88. $p = 0.003$) as compared to those with five or less symptoms of depression. In other words, for women who had six or more depressive symptoms, there was close to a 50% increased risk of death. Furthermore, of those depressed, there was an 80% increased risk of death caused by heart disease ($HR = 1.8$; 95% CI = 1.2-2.5, $p = .003$). A limitation to the study was generalization as the participants were Caucasian-American women. Despite that limitation, the study demonstrated that depression can have wide-ranging negative implications on health and longevity (Whooley and Browner, 1998).

In a related study, Barefoot and colleagues (2000) investigated depressive symptoms to assess their relative effectiveness in predicting survival. Participants ($N = 1,250$) were patients who were hospitalized with coronary artery disease between 1974 and 1980 and who had received follow-ups six to 12 months after their hospitalization for approximately 19 years. Participants were given several instruments that measured depression and hopelessness. Coronary artery disease, age, gender and income were controlled, and cox proportional results indicated that hopelessness ($RR = 1.50$, $p = 0.15$) and depression ($RR = 1.29$, $p = 0.0001$) were the largest predictors of mortality. In other words, a higher level of hopelessness and depression indicated an increased risk factor for mortality. A limitation to this study was that hopelessness

was determined from one dichotomous question, “*I find it hard to not to give up hope for the future,*” with less than a 50% response rate. However, the study is relevant as it demonstrates that depression among individuals diagnosed with a chronic illness increases their risk of mortality (Barefoot et al., 2000).

Biased Perceptions

Negative self-talk and/or self-assessment are common characteristics of depression. Furthermore, thoughts of worthlessness can be all encompassing and impact the way people perceive their overall experiences (Adams et al., 2016). To better understand depression and how it harms perception, Chan and colleagues (2006) compared the perception of QoL between depressed and non-depressed adults ($N = 259$; $n = 80$ with depression; $n = 179$ without depression) over the age of 65 in China. Participants were given measures to assess: (a) QoL, (b) cognitive impairment, (c) depression, (d) functional independence (activities of daily living), (e) instrumental activities of daily living (activities that allow a person to live independently), (f) health, and (g) social support. Results of a Pearson correlation test revealed that individuals in the depressed group received more social support ($M = 5.13$, $SD = 2.05$, $p < 0.001$) than the non-depressed group ($M = 3.51$, $SD = 2.57$, $p < 0.001$), but were significantly less satisfied with their social support ($M = 18.32$, $SD = 6.54$, $p < 0.001$) than the non-depressed group ($M = 26.92$, $SD = 6.78$, $p < 0.001$). Moreover, the depressed group had higher instrumental activities of daily living (IADL) scale scores ($M = 26.97$, $SD = 6.80$, $p < 0.001$) than the non-depressed group ($M = 24.79$, $SD = 6.38$, $p < 0.001$). However, despite the higher IADL scores and the number of support the depressed individuals received, they reported significantly less QoL ($M = 67.16$, $SD = 8.98$, $p <$

0.001) than the non-depressed group ($M = 97.27$, $SD = 13.52$, $p < 0.001$). In other words, regardless of advantages in health or social support, suffering from depression skewed their overall sense of QoL. A limitation to the study was that it was a convenience sample that was taken from a single region in Hong Kong, reducing generalizability. However, the results identified how depression can affect the psychosocial aspects of older people, with broader findings (e.g., depression diminishes perception of QoL) having cross-cultural applications (Chan, Chien, Thompson, Chiu, and Lam, 2006).

Impact of Social Support

Social support has been recognized as a buffer for depressive symptoms. Adams and colleagues (2016) investigated the association of different psychosocial and health-related factors to life satisfaction. Data was taken from the longitudinal *Einstein Aging Study*. Participants ($N = 237$) over the age of 70 were evaluated on two occasions two weeks apart. Individuals were given instruments for: (a) neuropsychological measures of memory, (b) executive functioning, (c) language, (d) general health, and (e) perceived stress. During the second visit, participants completed life satisfaction and other self-report measures. After including demographic, mood and social support variables, Linear regression results identified that fewer depressive symptoms ($B = -5.24$, $SE = 1.62$, $p < 0.001$) and lower perceived stress ($B = -.16$, $SE = 0.06$, $p < 0.01$) were significantly associated with higher life satisfaction. In addition, there was a significant interaction between social support and depression ($B = .19$, $SE = .07$, $p < .05$), indicating that social support buffered the negative impact of depressive symptoms on life satisfaction. Limitations to this study included a survivorship bias as participants who passed away were not

studied. In addition, there was slight overlap between one of the questions on the satisfaction with life scale and the depression scale related to life satisfaction. Regardless of the limitations, the study provided relevant insight into the importance of social support and its ability to buffer the negative impact of depression (Adams et al., 2016). Perhaps one of the most challenging aspects of depression is that depression is a negative emotion that prevents an individual from seeing the broader picture.

Between 1990 and 2013 the number of people worldwide suffering from either depression or anxiety increased from 416 million to 615 million (World Health Organization, 2016). Moreover, for every U.S. dollar invested in treating depression or anxiety, there is a return of four U.S. dollars (World Health Organization, 2016). Therefore, research into how to effectively treat or mitigate the effects of depression are needed.

Broaden-and-Build Theory of Positive Emotions

The broaden-and-build theory of positive emotions (Fredrickson 1998, 2001) states that positive emotions such as joy, contentment, love, and interest can enhance overall well-being (Garland, et al. 2010). The basic supposition of the theory is that positive emotions can, in the moment, *broaden* an individual's attention and awareness in ways that, overtime *build* one's repertoire of lasting personal resources (Fredrickson 1998, 2001; Vacharkulksemsuk & Fredrickson, 2013).

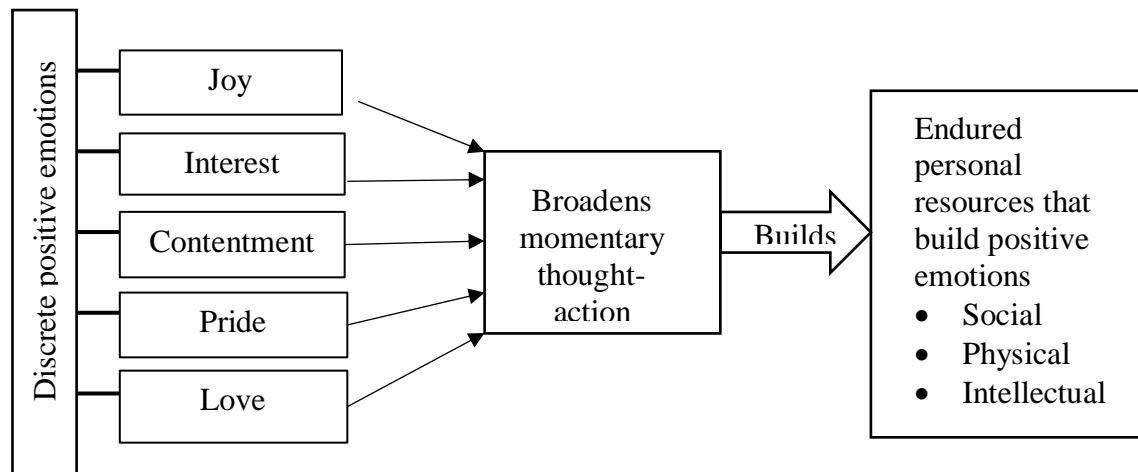


Figure 1. Model based on Fredrickson's (2001) Broaden-and-Build Theory

In other words, individuals who experience more positive emotions have access to a wider range of coping skills and can adapt better to difficulty (Dolphin, Steinhardt, & Cance, 2015). In addition, the results of various studies have shown that positive emotions are a valuable resource as they can: (a) promote better adjustment to adversity (Riulli, Savicki, & Spain, 2010), (b) protect against stress (Faulk, Gloria, Cance, & Steinhardt, 2012; Folkman, 1997), (c) increase resiliency (Tugade & Fredrickson, 2004), and (d) enhance health and well-being (Danner, Snowdon, & Friesen, 2001; Keyes, 2002; Nelson & Knight, 2010). In addition, positive emotions provide the confidence to change and try new experiences thereby developing other positive traits such as creativity, resiliency, broader knowledgeable, and better social integration (Fredrickson, 1998; 2005). Moreover, positive affect is associated with protective psychosocial and behavioral factors such as greater social connectedness, perceived social support, optimism, and preference for adaptive coping responses (Diener & Chan, 2011). An example of the broaden-and-build theory and how it may impact behavior is outlined below.

Table 1

Example of Broaden-and-Build: Psychological and Behavioral Impacts

	Negative Emotion	Positive Emotion
Example	Anger, fear, disgust, sadness	Joy, happiness, love, hope
Internal Message	Something is wrong	Everything is fine
Behavioral Impulse	Wanting to escape, hide, attack	Wanting to play, explore, socialize
Options	Few, narrow options aimed at staying safe	Many options aimed at growing
Consequence	Narrow a person's options and abilities of how they can handle the situation	Broaden an individual's options and abilities of how they can handle the situation

Premise of Broaden-and-Build

The broaden and build theory effectively conceptualizes the way positive emotions facilitate psychological well-being (Dolphin et al., 2015). Historically, the study of positive emotions has been overshadowed by the amount of empirical research devoted to negative emotions (Fredrickson, 2005). Reasons for the disparity in research on positive emotions include a greater interest in problems resulting from negative emotions that affect society such as: (a) phobias, (b) anxiety, (c) aggression, (d) violence, and (e) depression (Fredrickson, 2005). In addition, negative emotions create adaptive coping strategies (e.g., fight or flight) more apparently than positive emotions (e.g., happiness, love, interest, and gratitude) which may explain the emphasis in research on negative emotions (Vacharkulksemsuk & Fredrickson, 2013). In addition, it is more cost effective to study negative emotions (World Health Organization, 2016).

Positive emotions such as joy, amusement, awe, and hope can protect against life stressors (Garland et al., 2010). While positive emotions may not create the problems that affect society or generate immediate coping strategies, they can provide important solutions to the problems that are created by negative emotions, as well as create more long-term adaptive techniques (Fredrickson, 1998). Moreover, positive emotions can function as self-perpetuating cycles, also called upward spirals (Garland et al., 2010). For example, joy may cause an individual to interpret a situation in a positive light, thereby opening and broadening a person's overall outlook. Furthermore, repeated instances of positive emotions can build into an upward spiral of well-being (Garland et al., 2010). Conversely, downward spirals (i.e., self-perpetuating and destructive cycles initiated by negative emotions) can lead to narrowed self-focused and defensive behavior (Garland et al., 2010).

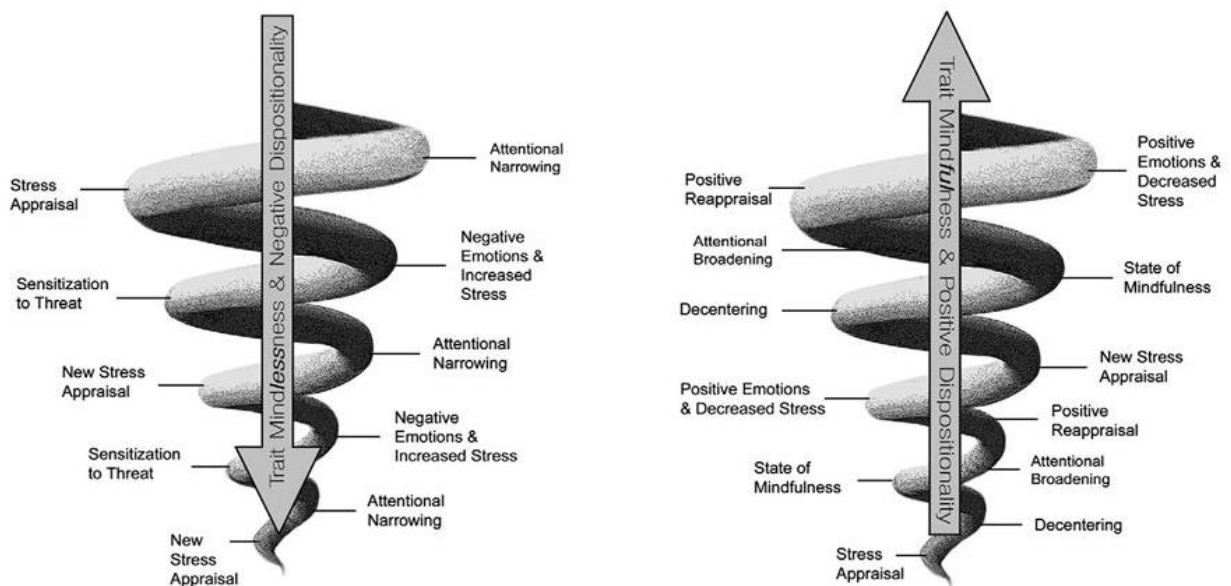


Figure 2. Downward spiral of negative emotions and upward spiral of positive emotions demonstrating how positive emotions can buffer stress (Dunn, 2012).

Broaden-and-Build Empirical Studies

One way to increase positive upward spirals is to engage in the act of savoring. Smith and Hollinger-Smith (2015) examined the relationship between savoring positive experiences (e.g., the ability to notice and control positive feelings) and well-being for older adults with higher or lower levels of resilience. Participants ($N = 164$) ages 55 and older were given inventories that assessed: (a) savoring, (b) resilience, (c) psychological well-being, (d) happiness, and (e) depression. Results from multiple regression analyses revealed that higher savoring scores predicted higher levels of happiness, ($b = .73, \beta = .54, p < .001$), and higher resilience was associated with higher happiness scores, ($b = .43, \beta = .24, p = .001$). Furthermore, for participants who had higher resilience, there was a significant positive relationship between savoring and happiness ($b = .58, \beta = .43, p < .001$). Moreover, even for the participants with lower resilience, higher savoring predicted higher happiness scores ($b = .88, \beta = .65, p < .001$). In other words, regardless of level of resiliency, older adults who had a greater capacity to enjoy positive experiences displayed higher levels of happiness, which can ultimately impact overall life satisfaction (Smith & Hollinger-Smith, 2015).

Resiliency

Resilient individuals have been characterized as having high positive emotionality (Block & Kremen, 1996; Klohnen, 1996). Furthermore, resilient individuals have been found to actively cultivate positive emotions using humor (Kuiper, 2012), relaxation techniques (Fredrickson et al., 2008), and/or optimistic thinking (Kumpfer, 1999). To determine the contribution of positive emotions to resilience, Tugade and Fredrickson (2004) studied undergraduate students ($N = 57$)

between the ages of 17-40. Students were asked to prepare a speech that would be filmed. In addition, participants were given measures for psychological resilience, positive and negative mood, emotion reports, and cognitive self-evaluations. Descriptive statistics (summing the standardized scores of positive mood and emotion reports of happiness) indicated that resilience was positively associated with the positive emotionality composite index ($r = .46, p < .001$). In addition, the mean self-appraisal of threat was 4.07 ($SD = 1.56$), ranging from 1-7, and resilience was associated with lower evaluations of threat ($r = -.31, p < .05$). In other words, highly resilient participants, who experienced more positive emotions, viewed the speech giving task as a challenge instead of a threat (Tugade & Fredrickson, 2004). Although the study relied solely on one negative emotion inducing situation (e.g., public speaking), the results demonstrated that there was a strong relationship between resiliency and positive emotions.

In another study to determine the influence of positive emotions on resilience, Tugade and Fredrickson (2004) again worked with undergraduate college students ($N = 192$) between the ages of 18-23. Students were asked to write an essay about a problem they were currently facing in as much detail as they could. Afterwards, students answered six Likert-scaled questions to determine if they could find positive meaning from their experiences (also referred to as “positive-meaning finding”). An index was then created of positive-meaning finding for each participant by adding the scores of all six questions. In addition, students also completed a resiliency instrument. Pearson correlation results indicated that the composite index of positive emotionality had a positive correlation with the index of positive-meaning ($r = .35, p < .0001$). Further, higher resilience was associated with greater positive-meaning finding ($r = .27, p < .001$). In addition, it was investigated if positive emotions mediated the effect of resilience on

positive-meaning finding. With resilience as the predictor variable and positive-meaning finding as the outcome variable, a significant correlation was found between the mediator (e.g., positive emotions) and the outcome variable ($r = .44, p < .0001$). Moreover, similar to Smith & Hollinger-Smith's (2015) study, the results indicated that resilience was no longer a significant predictor of positive-meaning finding when positive emotions were controlled ($\beta = .16$), $t(189) = 2.36$. Therefore, experiences of positive emotions appear to help individuals find positive meaning in negative situations (Tugade & Fredrickson, 2004). One limitation to the study was that the act of writing itself can be therapeutic and may have confounded the results, as several studies have demonstrated that the act of writing has positive effects (Tugade & Fredrickson, 2004). Nonetheless, the study provided evidence that positive emotions positively influenced overall resilience by helping individuals create positive meaning-making from negative situations. The results of Tugade and Fredrickson's studies demonstrate the importance of experiencing and/or enhancing positive emotions as they can help an individual move forward psychologically. The ability to move forward and stay positive is an important attribute for aging adults.

Physical and Mental Health

In addition, studies have shown that experiencing positive emotions influences both physical and mental health. For instance, Fredrickson and Levenson (1998) conducted a test to determine if positive emotions could speed up cardiovascular recovery time after experiencing negative emotions. Undergraduate female students ($N = 60$) participated by watching movie clips while their facial movements and cardiovascular signs were measured both objectively (e.g.,

heart and pulse measurements) and subjectively (e.g., self-report). Every participant initially watched a short clip that elicited fear, followed by one of four video clips that prompted the following emotions: (a) contentment, (b) amusement, (c) neutrality, and (d) sadness. Baseline information was gathered before any of the films were shown. Additionally, a baseline confidence interval (the time it took for each participant's cardiovascular levels to return to pre-film resting) was calculated. Participants were then shown the clip designed to elicit fear and results indicated that the clip produced significant reports of negative subjective experience and significant cardiovascular changes. Following the fear inducing clip, students were randomly shown one of the four emotion eliciting clips. Results indicated that those who watched the contentment-inducing clip displayed faster returns to pre-film levels of cardiovascular activity than those who watched the neutral clip [$t(26.8) = 2.29, p = .030$], and the sad clip [$t(26.0) = 3.78, p = .001$]. Similarly, those who watched the amusing clip had faster returns than those who viewed the neutral clip [$t(27.9) = 2.28, p = .030$], and the sad clip [$t(22.3) = 3.83, p = .001$]. The results demonstrated that negative and positive emotions can influence cardiovascular activity (Fredrickson & Levenson, 1998). A limitation to the study was generalizability (e.g., all female participants) and the fact that only one negative emotion was tested (e.g., fear). Furthermore, emotions were elicited through video clips, which may not translate to other methods of eliciting positive emotions. However, the results illustrate that even mild positive emotions (e.g., amusement and contentment) can increase cardiovascular recovery from a negative emotion such as fear. The implications of experiencing positive emotions and how they can increase an aspect of physical recovery is important for at-risk populations such as aging adults.

In addition to cardiovascular recovery, positive emotions have been found to influence the immune system in relation to the common cold. Cohen and colleagues (2003) tested the hypothesis that those who experience more positive emotions are less at risk for developing a cold. Participants ($N = 334$) between the ages of 18-54 were initially screened for sickness and baseline health information was gathered. In addition, participants completed assessments on their emotional styles. Participants were then quarantined for five days after receiving nose drops carrying one of two strains of the common cold. Every day the participants reported on their emotional state as well as their health. In addition, they were assessed physically to determine if they were getting sick. Twenty-eight days after receiving the virus culture, participants' blood was collected and analyzed. Researchers assessed participants' colds by measuring infection or other criteria such as analyzing mucus. Multiple linear regression was used and results for both strains of cold indicated that increases in positive emotional style (PES) were associated with decreases in the rate of colds ($b = -.48 [\pm .19]$). Negative emotional style (NES) was not associated with the risk for illness. Although the results demonstrated that PES is associated with decreasing illness rates (Cohen et al., 2003), a major limitation was generalizability to other strains of the common cold or other types of illnesses. However, the results provided insight into the association between positive emotions and a greater resistance to the common cold; an important association for populations at risk such as aging adults.

Emotions can alter the way individuals cope which can ultimately impact their physical health (Danner et al., 2001). The Nun Study, a longitudinal study of aging and Alzheimer's disease demonstrated the far-reaching influence of positive and negative emotions. Starting in 1930, over 600 nuns between the ages of 75 to 102 were asked to write one-page

autobiographies. Danner and colleagues (2001) examined 180 autobiographies of nuns between the ages of 18 and 32. Two coders identified and classified the words, the sentences, and overall emotion usage in each autobiography as being positive, negative, or neutral. After controlling for education, lifetime occupation, linguistic ability, and time of writing, Cox regression analyses were conducted to determine the risk of mortality and the percentile/quartile rankings of the number of positive, negative, and neutral sentences. Results indicated a statistically inverse association between the percentile ranking of positive sentences and the risk of mortality in late-life (Hazard Ratio = -1.4 and a 95% CI of -2.3 to -0.6, $p < .001$). In other words, for every 1.0% increase in the number of positive sentences used, there was a 1.4% decrease in death rate. After adjusting for age and education, low quartile rankings with positive emotion sentences, words, and emotion usage, results also revealed statistically inverse associations between positivity and mortality (Hazard Ratios among the three classifications were between 2.5 and -4.3, $p < .01$). In addition, Cox regression was used to determine the probability of surviving to an advanced age. Results showed a strong association between all four quartile rankings of the number of positive emotion sentences, sentences, and emotion usage and survival. The difference in the median age at death from the lowest quartile ranking to the highest was 6.9 years (positive emotion sentences), 9.4 years (positive emotion words), and 10.7 years (variety of positive emotions). The results of Nun Study indicated a strong association between positive emotional content in autobiographies and an increased lifespan (Danner et al., 2001). A limitation to the study was that the nuns were required to write autobiographies, which could have influenced the type of content they recorded. In addition, these autobiographies contained only a snapshot of the nuns'

lives and not an overall picture of their personality and/or temperament. Despite the limitations, the study preliminarily demonstrated that positive emotions can influence health and longevity.

Overall, positive emotions impact individuals in several ways. Research has demonstrated that positivity can: influence resiliency, enable an individual to cultivate meaning from negative situations, shorten the length of a common cold, speed up cardiovascular recovery, and in some cases increase longevity. In addition, the benefit of experiencing positivity has long lasting results and can influence an individual's outlook on life which can influence his or her QoL.

Chapter Summary

As individuals live longer, increased understanding of quality of life and related factors are warranted. Higher levels of QoL among aging adults has been shown to be inversely related to heightened economic health related burden. For instance, the more satisfied individuals feel about their life, the less depressed and more engaged they will be. Researchers are studying QoL in an effort to help lower depression among aging adults. The World Health Organization predicted that by 2020, depression will become the third leading cause of disability in the world. Although depression is often overlooked or confused with early onset dementia, addressing its impact and studying ways to mitigate the effects with factors such as SA and PF are warranted. Finding ways to maintain a youthful SA and enhancing PF among aging adults are two potential solutions to combating depression. In addition, both SA and PF can increase positive emotions which have been shown to broaden an individual's focus to encompass a wider array of solutions to build healthy coping skills. In contrast, negative emotions can narrow the scope of attention

and result in a rigid, brittle focus on what is threatening and harmful (Garland et al., 2010). Therefore, experiencing or savoring moments that promote positive emotions can help an individual develop and expand a repertoire of intricate skills to successfully navigate aspects of aging. It is theorized that two important variables that can enhance positive emotions and overall QoL, while lowering the risk of depression, are SA and PF. Therefore, the aim of the research study was to examine to what extent SA, PF, and depression predict QoL.

CHAPTER THREE: METHODS

In chapter three the researcher provides an overview of the research study including the research design, methods, and procedures of the investigation. The purpose of this research study was to examine the extent to which SA, PF, and depression predicted QoL for aging adults 55 and older. Specifically, the researcher tested the extent to which SA (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question), PF (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predict QoL (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]). The study utilized a correlational research design (Gall et al., 2007) to examine the primary research question and subsequent exploratory questions. In chapter three, the researcher delineates the following components of the research study: (a) population and sampling procedures, (b) data collection methods, (c) measurement and instrumentation, (d) research design and method, (e) primary research and exploratory questions, (f) data analysis method, (g) study limitations, and (h) ethical considerations.

Research Design

The current research study followed a descriptive, correlational research design to investigate the research questions of this investigation. The researcher analyzed the data using standard multiple regression to investigate the relationship of the predictor variables (e.g. SA, PF and depression) on the criterion variable (e.g. QoL). The researcher selected multiple regression because it provides information on the combined effect of all three independent variables on the

dependent variable, but also allows for the researcher to study each variable to determine its singular influence on the dependent variable (Pallant, 2013). In addition, the researcher sought approval from the university institutional review board prior to data collection, analysis, and evaluation. The researcher sought to gather data using two methods: face-to-face recruitment (F2F) and online. Participants, either online or F2F, were asked to fill out a questionnaire comprised of four surveys (e.g., SA, PF, depression, and QoL) and a demographic form for a sum total of 56 questions. The researcher then screened the data, checked the assumptions, and analyzed the data using standard multiple regression.

Sample Size

The aging adult population is vulnerable to chronic health issues such as depression and isolation which can negatively impact their QoL (King et al., 2013; Colby & Ortman, 2014). Moreover, when older adults remain inactive, they are at a higher risk for falls due to weaker muscles and bone loss (National Council on Aging, 2017). As a result, studying older adults to better understand the positive influences on QoL may help to reduce the risk of health concerns and promote engagement in life.

Due to the large numbers of aging adults, 47.8 million adults over the age of 65 residing in the U.S. (U.S. Census Bureau, 2017), it is important to have an appropriate sample size to ensure population representation and statistical power (Gall et al., 2007). In addition, sample size is an essential component in reducing the chances of making a Type II error (fail to reject a false null hypothesis) for the hypothesized outcome. Therefore, *a priori* sample size calculation for multiple regression was determined using G-power. For the current study, a desired power of

(0.95) with an effect size (0.1), with three predictors, at a probability of $p < 0.05$ were utilized resulting in a recommended sample size was 110 participants. The researcher selected a power of 0.95 because it increases the chances of making accurate predictions 95% of the time.

Tabachnick and Fidell (2013) outlined a second measure for determining multiple regression. The second sample size method utilized two mathematical formulas: one formula, for testing multiple correlations, was $N \geq 50 + 8m$, with m as the number of independent variables. The second formula, suggested for testing individual predictors, was $N \geq 104 + m$. Both formulas assume a medium effect size. Therefore, using either formula [e.g., $74 \geq 50 + 8(3)$; $107 \geq 104 + 3$], the researcher would need at minimum, 74 participants to test regression and at least 107 participants to test individual predictors (Tabachnick & Fidell, 2013). If the purpose is to determine both the overall correlation and the individual independent variables, Tabachnick and Fidell suggested using the larger N (e.g. 107). Although these numbers were slightly different than what was outlined by G-power, they were close in estimation resulting in a potential sample size between 74-110 participants.

Based on previous research with aging adults a survey response rate of 50% for F2F participants was expected (see Edelman study, 2013). Furthermore, with the additional use of collecting data online as well as the fact that a larger sample size increases generalizability (Gall et al., 2007), the researcher sought a larger sample of 220 surveys to ensure at least 110 useable surveys. To achieve a sample of 220 surveys, the researcher utilized convenience sampling with eligibility criteria (e.g., 55+ and English fluency) and community-based recruitment for half of the participants ($n = 110$), and online for the remaining half ($n = 110$). Convenience sampling is deemed reasonable when the entire population is not available for sampling (Gall et al., 2007).

Therefore, the target population for the study was 220 participants to ensure at minimum, 110 completed surveys.

Face-to-Face Data Collection

Initial locations for F2F recruitment were: churches, senior centers and clubs, libraries, retirement communities, and educational programs. The researcher sought access to the locations through the personal and professional contacts.

The researcher recruited participants from churches in Central Florida, Alabama, and Southern California. For members of the church in California, the researcher sent surveys to be distributed in her absence. In addition, the researcher recruited participants from several senior centers, libraries, and clubs both in and around the Central Florida area. Retirement communities within Florida as well as New Jersey were contacted and visited. For individuals living in New Jersey, surveys were mailed to a contact person with stamped returned envelopes to be mailed back. Lastly, one educational program affiliated with a large university in Central Florida agreed to have the researcher come to their educational meetings and recruit participants.

Online Data Collection

Amazon Mechanical Turk (MTurk) started in 2005 and reports that it exceeds 500,000 workers from 190 countries (“Amazon Mechanical Turk Requestor Tour,” 2005-2017). Furthermore, it is growing in popularity among researchers as it provides a timely method to gather data (Buhrmester, Kwang, & Gosling, 2011; Chandler, Mueller, & Paolacci, 2014; Paolacci, Chandler, & Ipeirotis, 2010). Amazon Mechanical Turk recruits participants (referred to as “workers”) to complete small and often repeating tasks, known as HITs (Human

Intelligence Tasks) uploaded by requestors (employers) for a monetary incentive (Chandler et al., 2014; Paolacci et al., 2010).

There are several concerns related to MTurk: (a) compensation, (b) high quality work, and (c) participants completing the same survey multiple times. Compensation rewards generally range from \$0.01 and rarely exceed \$1.00 (Paolacci et al., 2010). In a study investigating compensation awards, Buhrmester and colleagues (2011) determined that reward amounts do not impact quality of work completed but can alter the speed with which participants complete tasks. Buhrmester's study revealed that in one hour, a 10-minute survey paying 2 cents yielded 5 responses, 10 cents 14 responses, and 50 cents 31 responses. In a study investigating factors that impact work quality, Peer and colleagues (2014) studied high reputation (95% approval rating or higher) rates and quality of data provided by participants. Participants ($N = 694$) who took part in the study were split into two groups, individuals ($n = 458$) with high MTurk reputations, and individuals ($n = 236$) with low reputations. Results indicated that participants' reputations predicted data quality, as high-reputation participants provided higher-quality data than low-reputation participants. In addition, only 2.6% of participants with high reputations failed the attention check questions, as opposed to 33.9% of individuals with low-reputation. The results indicated that MTurk participants with a high reputation provided better quality data, while attention check questions only improved data quality for individuals with low-reputations (Peer, Vosgerau, & Acquisti, 2014). MTurk does not provide requestors with participants' reputation scores; however, reputation scores can be used as an eligibility criterion when seeking participants.

In addition, while fraudulent activity (e.g. one participant completing the same survey several times) is a potential concern among researchers, participants are prevented from taking the same survey repeatedly, as Amazon continuously identifies and eliminates duplicate accounts (Chandler et al., 2014). Moreover, in a study examining users and MTurk surveys, IP addresses were studied, and only 2.5% of participants submitted surveys from the same addresses (Berinsky, Huber, & Lenz, 2012). In a follow-up analyses, Shapiro and colleagues (2013) found that 2.8% of participants ($N = 14$) had similar IP addresses. However, of those individuals, eight reported demographics consistent with being separate individuals while using the same IP address, while the remaining six may have worked around the system and completed the same survey twice (Shapiro, Chandler, & Mueller, 2013). In other words, while some users may find a way to work around the system and repeat surveys, the data suggests that this is a low occurrence. Therefore, the researcher in the current study uploaded surveys to MTurk using third party software (e.g., Qualtrics) with a monetary incentive of \$.50/survey.

Qualtrics

Qualtrics allows for complex surveys to be created and easily connected to MTurk through a link for participants to use (Paolacci et al., 2010). Although MTurk has an in-house survey platform, Qualtrics has the capability to verify each participant by assigning a unique code that must be entered to complete the survey. The unique code provides a way for requestors in MTurk to verify participation and match survey responses to payment (Paolacci et al., 2010). In addition, Qualtrics allows individuals to not only create, test, and modify surveys, but also

track response progress, prevent fraud, and send reminder and thank you emails (Qualtrics, 2017).

Instrumentation

The researcher utilized five data collection instruments for the current research study including: (a) The CAS (Barak, 1979; Barak & Schiffman, 1981) and a single item question; (b) the APTS (Shen et al., 2014a); (c) The GDS (Brink et al., 1982); (d) the SWLS (Diener et al., 1985); and one *general demographic form*. Each of the instruments used were made available online except for the APTS, which the researcher received from the author (X. Shen, personal communication, March 28, 2017). The researcher combined the instruments (see appendices E, F, G, and H) into one questionnaire made available both digitally and hardcopy. To reduce measurement error, the researcher distributed the questionnaire and the survey link to individuals outside of the study to determine length of time to take the questionnaire as well as to check for clarity (Dillman, Smyth, & Christian, 2009).

Subjective Age

Similar to previous studies, SA was assessed by using the CAS (Barak, 1979; Barak & Schiffman, 1981) and by using a single item question (e.g., “*Sometimes people feel older or younger than their age. During the last month, what age did you feel most of the time?*”; see Kleinspehn-Ammerlahn, Kotter-Grühn, & Smith, 2008; Kotter-Grühn et al., 2015; Kotter-Grühn, Kleinspehn-Ammerlahn, & Gerstorf, 2009; Mock & Eibach, 2011; Rubin & Bersten, 2006; Stephen, Sutin, Caudroit, & Terracciano, 2016; Westerhof & Barrett, 2005). Both measures

involve using proportional discrepancy scores. Other methods of assessing SA are variations of both the CAS and the single item question. The researcher will first discuss the single item question.

Single Item Question

Research on single item questions have been limited because it is difficult to test the items for reliability; however, single item questions are easy to administer and are therefore utilized quite a bit in gerontology studies (Barak, 2009). Moreover, although difficult to test for reliability, single item questions are often intuitively meaningful (Vaske, 2008). In the current study, the researcher utilized a single item question by asking participants, “*sometimes people feel older or younger than their age. During the last month, what age did you feel most of the time?*” The researcher was then able to utilize the participant’s actual age (asked in the questionnaire) and felt age to calculate SA using proportional discrepancy scores.

Proportional discrepancy scores are calculated by subtracting a participant’s felt age from his or her actual age with the difference being divided by chronological age [(felt age minus actual age)/actual age]. A negative value indicates a younger SA while a positive value indicates an older SA (Choi, DiNitto, & Kim, 2014; Kotter-Grühn et al., 2015; Kotter-Grühn & Hess, 2012). The benefit of using discrepancy scores is that they also consider a person’s actual age, because feeling 70 is different for a 65-year-old than it is for an 80-year-old (Kotter-Grühn et al., 2015). Furthermore, proportional discrepancy scores are recommended for studies that test participants from a wide range of ages to control for the effects of actual age (Kotter-Grühn et al., 2015).

The Cognitive Age Scale

Barak and Schiffman (1981) created The CAS using Kastenbaum and colleagues' 1972 four domains of SA. The four questions articulated by Barak captured the four dimensions of aging: (a) body (health/fitness/attractiveness), (b) life satisfaction, (c) personality/attitude (self-efficacy/optimism/view of old age), and (d) behavior (youth-preserving activities/learning new things; Teuscher, 2009). Instructions on the CAS outline that participants are to check which decade (20s—80s) they *feel* they belong in for each of the questions. Each of the four dimensions can be scored separately or a composite score can be derived. Directions specify that for each decade selected by the participant, a midpoint value is assigned (e.g. a response of “40’s” would be recorded as 45) a composite score is then formed by averaging the midpoint values for all four dimensions (Barak & Schiffman, 1981). Once a composite score has been created, proportional discrepancy scores are used to find a total SA (A. Terracciano, personal communication, July 18, 2017).

Table 2

Cognitive Age Scale Items (Barak, 1979; Barak & Schiffman, 1981)

	20s	30s	40s	50s	60s	70s	80s
I feel as though I am in my...							
I look as though I am in my...							
I do most things as though I were in my...							
My interests are mostly those of a person in his/her...							

Psychometric Properties of the CAS

Shortly after its development, Barak and Schiffman (1981) determined reliability for the CAS by utilizing three tests: (a) test-retest reliability, (b) Guttman's Lambda Test, and (c) a split-half reliability test (Barak & Schiffman, 1981). The test-retest reliability occurred during two interview sessions with three weeks in between with a small sample size ($N = 15$) and resulted in a test-retest coefficient of .88. In addition, the Guttman Lambda (.86) and Spearman-Brown split-half (.85) reliability tests revealed good reliability (Barak & Schiffman, 1981). In a related study, Wilkes (1992) established dimensionality and reliability of the CAS using a sample of women ($N = 363$) between the ages of 60-79. Utilizing the congeneric measurement-error model, results indicated a good fit ($df = 2$, $X^2 = 2.6$, $p = 0.267$). In other words, the results of the congeneric model indicated that each of the four measurements (e.g., feel, look, act, and interests) were measuring the same underlying construct—subjective age. In addition, under the congeneric model the composite reliability for the CAS, computed using Jöreskog's Formula, was .89. In addition, subscale reliabilities were reported as (feel = .79, look = .48, act = .72, and interests = .65; Wilkes, 1992). In other words, of the four indicators measuring SA, *feel*, *act*, and *interests* were more reliable than the *looks* indicator. In another study, Gwinner and Stephens (2001) investigated the mediational role of SA and consumerism by interviewing 355 adults between the ages of 55-91. The CAS demonstrated high internal consistency with a Cronbach alpha of 0.88. An additional study conducted by Mathur and Moschis (2005) surveyed individuals ($N = 250$) between the ages of 18-92, and the CAS again demonstrated good reliability with an alpha reliability coefficient of 0.95. Furthermore, Teuscher (2009) researched the structural model of the scale and the CAS revealed a Cronbach alpha of .74 with a high

goodness of fit: $X^2(2) = 1.223, p = .542$; TLI = 1.00; CFI = 1.00; RMSEA = .00. In addition, the CAS proved to be reliable and valid outside of the U.S. Guiot (2001) used the CAS in France with women ($N = 225$) over the age of 50. Using structural equation modeling (SEM), Guiot (2001) found the CAS to be reliable and valid ($\alpha = 0.93$), although modeling indicated that the look-age item be eliminated, which reduced the scale to three-items.

Table 3

CAS Reliability Table

Test	Results
^a Test-retest reliability	.88
^a Guttman Lambda	.86
^a Spearman-Brown split-half	.85
^b Subscale reliability	
Feel =	.79
Look =	.48
Do =	.72
Interests =	.65
^b Jöreskog's Formula for reliability	.89
^c Cronbach alpha	0.88
^d Alpha reliability coefficient	0.95
^e Cronbach alpha	0.93

Note. ^aBarak & Schiffman, 1981; ^bWilkes, 1992; ^cGwinner & Stephens, 2001; ^dMathur & Moschis, 2005; ^eGuiot, 2001

Alternative Measures of Playfulness Instruments

Due to the relative newness of the PF construct, a short description of PF instruments followed by the PF instrument selected for the current study has been provided. To date there are approximately 12 instruments designed to measure the construct of PF: (a) three scales to assess PF in children (Barnett, 1990; Bundy et al., 2001; Lieberman, 1977), (b) one for adolescents (Staempfli, 2005), (c) one for older adults (Yarnal & Qian, 2011), and (d) seven for adults (Glynn & Webster, 1992; O'Connel, Gerkovich, Bott, Cook, & Shiffman, 2000; Proyer, 2012;

Proyer, 2017; Schaefer & Greenberg, 1997; Shen et al., 2014a). As the current study investigated PF among older adults, the PF instruments discussed below are only the measures developed for adults.

The Older-Adult Playfulness Scale (OAP; Yarnal & Qian, 2011) was developed to measure PF among older adults. The scale consists of 15 adjectives each linked to a Likert scale from 1 to 10. Individuals can then select if the adjective is 1 (“not at all like me”) through 10 (“very much like me.”) Some of the adjectives listed on the scale are: (a) happy, (b) optimistic, (c) joyful, and (d) clowning. *The Adult Playfulness Scale* (APS; Glynn & Webster, 1992) has a similar layout to the OAP. The APS has 32 adjectives (e.g., adventurous, animated, bouncy, calm) paired with an opposite descriptor (e.g., purposeful, passive, staid, agitated). Individuals are to place a mark anywhere on the line between the two adjectives. The closer the mark to the adjective, the more the individual identifies with that particular descriptor. *The Playfulness Scale* (PS; O’Connell et al., 2000) measures PF with items that contrast playful behavior with more serious behaviors (e.g., “*feeling serious versus feeling playful*,” “*wanting to do something important versus wanting to do something frivolous*”). *The Short Measure of Adult Playfulness* (SMAP; Proyer, 2012) is a five-item instrument that utilizes a seven-item Likert scale (“strongly disagree” to “strongly agree”). Examples of the SMAP are: (a) “*I am a playful person*”, (b) “*I frequently do playful things in my life*”, and (c) “*a good friend would describe me as a playful person*”. *The Other-directed, Lighthearted, Intellectual, and Whimsical* (OLIW; Proyer, 2017) scale is a 28-item measure that does not provide a total score for PF but delineates four aspects of PF, other-directed, lighthearted, intellectual, and whimsical. Examples of a few questions are: (a) “*I can always think of something to do and I am never bored*”, and (b) “*I am a lighthearted*

person.” *The Playfulness Scale for Adults* (PSA; Schaefer & Greenberg, 1997) has 28 items and loads on four factors: fun-loving, humor, silliness, and whimsical. However, the questions are specific (e.g., “I would like a nerf basketball in my room,” “I would rather go to Toys “R” Us than browse a mall”). Furthermore, the PSA has yet to be used in an empirical study (Van Vleet & Feeney, 2015).

Each of the instruments developed to measure PF either provided positive adjectives that would further promote bias in selection (e.g., “happy,” “positive”), or posited positive characteristics next to negative or unappealing characteristics (e.g., “bright” versus “dull”), did not define the construct being measured when asking individuals to rate their level of playfulness, or did not provide a total PF score. As such the researcher selected a different measure to capture PF, the *Adult Playfulness Trait Scale* (APTS; Shen et al., 2014a).

The Adult Playfulness Trait Scale

The APTS (Shen et al., 2014a) is a 19-item instrument and measures three areas of adult playfulness: (a) fun-seeking motivation, (b) uninhibitedness, and (c) spontaneity. The APTS utilizes a seven-point Likert scale with options ranging from 1 (“strongly disagree”) to 7 (“strongly agree”). A total score for the instrument can be calculated, along with total scores for each of the three subscales, thereby allowing individuals to determine which aspects of PF influences their overall score the most.

Table 4

Sample Adult Playfulness Trait Scale Items (Shen et al., 2014a)

	Strongly Disagree	Strongly Agree
1. I don't always follow the rules						
2. I believe in having a good time						
3. I often do unplanned things						

Psychometric Properties

Shen and colleagues (2014a) studied the APTS with a sample of individuals ($N = 477$) between the ages of 22-40. The APTS demonstrated adequate face and content validity, strong structural validity, and good internal consistency (Cronbach's alpha = .87 for the entire scale and .68 to .87 for the subscales). In a subsequent validation study, Shen, Chick, and Zinn (2014b) conducted two studies to examine the APTS's predicative validity, concurrent validity, and convergent validity. The first study utilized Pearson correlations to discover the relationship between the APTS and different measures of theoretically related constructs [e.g., playful behavior (five questions), the *Self-as-Entertainment* scale (SAE; Mannell, 1984), Goal Attainment (six questions), *Boredom in Free Time Scale* (BFTS; Caldwell, Smith, & Weissinger, 1992), and Global Playfulness (two questions)]. Results presented strong and significant correlations between the APTS and the tendency to engage in playful behavior ($r = .55, p < .01$) and also global measures of playfulness ($r = .59, p < .01$). In addition, there was also a significant small to modest correlation ($r = .18$ to $.30, p < .01$) between the APTS and the SAE, demonstrating a small overlap between the constructs. Furthermore, there were small but significant correlations between the fun-seeking motivation subscale of the APTS and the goal-attainment attitude ($r = -.16, p < .01$) and free-time boredom ($r = -.20, p < .01$). Meaning,

individuals with a strong fun-seeking tendency may care a little less about external goals during their free time as well as be a little less bored.

In the second study, participants ($N = 209$; $n = 49$ other-referred, $n = 160$ self-referred) were assessed for level of PF (through questions that involved a self-assessment and a rating of friends who were referred) and divided into two groups: high playfulness and low playfulness. Participants were then given the APTS. The results indicated that the APTS scores significantly correlated with the two global measures of playfulness (friends' ratings of a person's playfulness, $r = .69, p < .01$ and self-rating of playfulness, $r = .64, p < .01$). In other words, the APTS was able to differentiate accurately individuals who were more playful from those who were not. In sum, individuals who scored higher on the APTS also reported engaging in playful behavior more often, were better able to entertain themselves during free time, and had a more playful global self-perception (Shen et al., 2014b).

In another study, Shen and colleagues (2017) investigated PF among parents and children and the influence of PF on adaptive behavior. Undergraduate students ($N = 311$) answered two assessments, the APTS and the *Short Individual Adaptability Scale*, a new scale created from two existing adaptability scales by Shen and colleagues. Students were asked to rate their own parents' level of PF using global assessments that corresponded to each of the subscales on the APTS and a shortened measure of the adaptability scale. SEM, a path model revealed that PF was positively related to all aspects of adaptability ($r = .142$ to $.337, p < .05$) with the exception of physical adaptation ($r = .092, p < .01$). Specifically, the strongest path in the model was between a child's own PF and his or her own adaptability ($r = .26, p < .01$). In addition, there were strong correlations between PF and adaptability among the parents ($r = .74$ and $.52, p < .01$

for mothers and fathers respectively). However, path models revealed that a father’s PF level did *not* significantly affect his child’s level of PF ($Beta = .09$, ns), nor did a father’s adaptability level significantly affect his child’s adaptability level ($Beta = .09$, ns). A mother’s level of PF had an indirect effect, although small, on the child’s level of PF ($Beta = .18$, $p < .01$), as did a mother’s level of adaptability on her child’s level of adaptability ($Beta = .19$, $p < .01$). In other words, a person’s own level of PF was positively related to adaptability (Shen et al., 2017).

The APTS was also used in Turkey (Yurt, Keles, & Kogar, 2016) with teacher candidates. Although the researcher could not verify the findings as the article was written in Turkish, Shen reported that the Yurt study “supported the three-level hierarchical construct structure of the APTS with high to acceptable internal consistency for each subscale and the entire scale” (Shen et al., 2014a, p. 4).

Table 5

APTS Reliability Table

Test	Results
^a Cronbach’s alpha	.87
^a Cronbach’s alpha subscales	.68-.87

Note. ^aShen et al., 2014a

The Geriatric Depression Scale: Short Form

The GDS scale (Brink et al., 1982), is a 15-item self-rated screening tool to measure depressive symptoms in aging adults. In addition, the GDS is designed to distinguish symptoms of depression from dementia. Scores greater than five indicate a possibility of depression while those greater than ten indicate a higher likelihood of depression (Smarr & Keefer, 2011).

Overall, the GDS has been found to have 92% sensitivity (the probability of a positive screening

for depression) and 89% specificity (a negative screen for depression) when evaluated against diagnostic criteria (Greenberg, 2012). Moreover, in a validation study comparing the short form (15 questions) to the long form (30 questions), both instruments differentiated depressed from non-depressed individuals with a high correlation ($r = .84, p < .001$; Sheikh & Yesavage, 1986). Therefore, the researcher selected the short form of the GDS to administer.

Table 6

Sample Geriatric Depression Scale Items (Brink et al., 1982)

	Yes	No
1. Are you basically satisfied with your life?		
2. Do you feel your life is empty?		
3. Do you often get bored?		

Psychometric Properties of the GDS

Friedman and colleagues (2005) tested the 15-item GDS with 960 participants living in a community who were impaired physically but cognitively intact. Results demonstrated moderate but acceptable internal consistency reliability ($\alpha = 0.75$). Moreover, Friedman’s finding was consistent with findings from three other studies using older hospital patients ($\alpha = 0.72$; Incalzi, Cesari, Pedone, & Carbonin 2003), elderly Dutch primary care patients ($\alpha = 0.76$, van Marqijk et al., 1995), and healthy older adults between the ages of 60-85 living in Florida ($\alpha = 0.77$; Jang, Small, & Haley, 2001). In addition, the GDS significantly differentiated depressed from non-depressed patients with acceptable sensitivity (0.814) and specificity (0.754) at a cutoff score of 6. Furthermore, the area under the ROC (receiver-operating characteristics) curve was 0.858 (Friedman, Heisel, & Delavan, 2005). In another study, investigating the reliability and validity of the GDS among home health patients, Marc and colleagues (2008) used secondary analysis of

data collected from a random sample study that consisted of 492 individuals over the age of 65. Results indicated an internal consistency-reliability equal to 0.80. In addition, the optimal cutoff was 5, which resulted in a sensitivity of 71.8% and specificity of 78.2%, with ROC under curve at 0.793 (Marc, Raue, & Bruce, 2008).

Outside of the U.S., the 15-item GDS continues to demonstrate good reliability and validity. Fountoulakis and colleagues (1999) tested the instrument with adults ($N = 271$; $n = 168$ no depression; $n = 103$ diagnosed with depression) in Greece over the age of 65. Researchers found that a score of 6/7 was found to be the best cut-off point for diagnosing depression. Moreover, sensitivity was 92.23 and specificity was 95.24 with a high internal consistency, Cronbach alpha = 0.94 (Fountoulakis et al., 1999). In another study, Malakouti and colleagues (2006) tested the GDS with an Iranian population ($N = 204$) over the age of 59, and the GDS was found to be internally consistent. Alpha, split-half coefficients, and test-retest reliability were 0.9, 0.89, and 0.58 respectively. Receiver operating curve (ROC) analysis revealed that the optimum cutoff score was 7/8 with a sensitivity of 0.9 and a specificity of 0.84 (Malakouti, Fatollahi, Mirabzadeh, Salavati, & Zandi, 2006). In a related study, Nyunt and colleagues (2009) utilized the GDS using a heterogeneous population of individuals ($N = 4,253$) over the age of 60 in Singapore. Results demonstrated that the area under the curve (AUC) was 0.98, sensitivity was at 0.97, and specificity was 0.95 with a cutoff of 4/5. Cronbach's alpha was 0.80 overall and item total correlations ranged from 0.77 to 0.81. The intra-class correlation coefficient of test-retest reliability was 0.83 (95% CI 0.81-0.84), suggesting that the GDS was stable over a two-week interval. In addition, the intra-class coefficient of inter-rater reliability was 0.94 (0.90-0.97) and the Cohen's kappa was 0.99 (0.98-1.00; Nyunt, Fones, Niti, & Ng, 2009). Although results

indicated different cut off scores for the GDS [e.g., 6/7 (Fountoulakis et al., 1999); 7/8 (Malakouti et al., 2006; 4/5 (Nyunt et al., 2009)] it is important to note that the developers of the GDS specified that scores ranging between 5-8 were in the “mild depression” range. Therefore, the cut off scores outlined in the studies fit within the range outlined by Brink and colleagues.

Table 7

GDS Reliability Table

Test	Results
^a Cronbach’s alpha	0.75
^a Cronbach’s alpha	0.72
^b Cronbach’s alpha	0.76
^c Cronbach’s alpha	0.77
^d Cronbach’s alpha	0.80
^e Cronbach’s alpha	0.94
^f Cronbach’s alpha	0.9
^f Split-half coefficients	0.89
^f Test-retest reliability	0.58
^g Cronbach’s alpha	0.80

Note. ^aFriedman et al., 2005; ^bIncalzi et al., 2003; ^cvan Marqijk et al, 1995; ^dJang et al., 2001; ^eFountoulakis et al., 1999; ^fMalakouti et al., 2006; ^gNyunt et al., 2009

The Satisfaction with Life Scale

The SWLS (Diener et al., 1985) is composed of five statements that measure satisfaction with one’s life. The five questions have a Likert scale ranging from 1 (“strongly disagree”) to 7 (“strongly agree”) thereby allowing the total score to fall between 5-35. Individuals with higher scores demonstrate higher levels of life satisfaction. The SWLS has widespread use and is one of the most widely used scales for measuring well-being (Lopez-Ortega, Torres-Castro, & Rosas-Carrasco, 2016).

Table 8

Sample Satisfaction with Life Scale Items (Diener et al., 1985)

	Strongly Disagree	Strongly Agree
1. In most ways my life is close to my ideal				
2. The conditions of my life are excellent				
3. I am satisfied with my life				

Psychometric Properties of the SWLS

The SWLS demonstrated good reliability with a two-month test-retest correlation coefficient of .82, and coefficient alpha of .87. Factor analysis resulted in a single factor accounting for 66% of the variance. Furthermore, internal consistency with item correlations for the five items were: .81, .63, .61, .75, and .66 respectively (Diener et al., 1985). In another study, Yardley and Rice (1990) examined the relationship between mood and subjective well-being in a 10-week study using undergraduate college students ($N = 65$). Students were tested in the beginning and then again 10 weeks later. Results indicated that for the SWLS, the Cronbach coefficient alpha was 0.80 for time one and 0.86 for time two, and the test-retest correlation coefficient was 0.50. Pavot and colleagues (1991) examined the validity of the SWLS in two studies. The first study utilized a sample of 39 adults between the ages of 53-92. During the initial meeting, participants completed life satisfaction measures and repeated the process five days later. Factor loadings for each question on the SWLS were: .83, .89, .82, .68, .78 respectively. Inspection of the scree plot for the SWLS revealed that the first factor had an eigenvalue of 3.26 with no other factors approaching an eigenvalue of 1. The first factor accounted for 65% of the variance in the items. In addition, the SWLS was compared with several other life satisfaction measures including: (a) *Life Satisfaction Index-A*, $r = .81$; (b)

Philadelphia Geriatric Morale Scale, $r = .65$; and (c) *Daily Satisfaction*, $r = .65$, which demonstrated good to moderate convergent validity (Pavot, Diener, Colvin, & Sandvik, 1991). In the second study using college students ($N = 125$), factor loadings for each question were: .93, .83, .89, .81, and .81 respectively. Again, the first factor accounted for a large part of the variance, 74% when no other factor approached an eigenvalue of 1 (Pavot. et al., 1991).

Outside of the U.S., the SWLS has been widely used, translated into several languages, and has demonstrated good validity and reliability. In two studies, Vera-Villarroel and colleagues (2012) evaluated the psychometric properties of the SWLS with a Chilean population. In the first study, Vera-Villarroel and colleagues (2012), conducted a study with 330 individuals between the ages of 18-52. Results indicated that the correlations obtained between the total SWLS and its items were all highly significant and varied between 0.42 and 0.77/Cronbach's alpha obtained a value of 0.82. In a second study, participants ($N = 1157$) were between the ages of 18 and 65. The second study analyzed the construct validity; and results indicated that a one factors' solution explained 59.31% of the variation with the items presenting a saturation of this factor between 0.56 and 0.88. In addition, except for the X^2 /degrees of freedom, the goodness-of-fit statistic displayed good fit: $X^2 = 34.943$; $gl = 6$, $X^2/gl = 34.943/5 = 6.98$; CFI = 0.987; GFI = 0.988; AGFI = 0.964; RMRS = 0.019; and RMSEA = 0.072 (0.051-0.095; Vera-Villarroel, Urzua, Pavez, Celis-Atenas, & Silva, 2012). In a more recent analysis studying the health of Mexican adults ($N = 13,220$) over the age of 50, the psychometric properties of the GDS were again evaluated. Analysis of the scale's reliability demonstrated good internal consistency ($\alpha = 0.74$). In addition, exploratory factor analysis resulted in a unique factor that explained 54.2% of the total variance and had an eigenvalue of 2.71. Each item showed a high saturation with factor

weights between 0.61 and .83 (Lopez-Ortega, Torres-Castro, & Rosas-Carrasco, 2016). In another study, Maroufizadeh and colleagues (2016) tested the SWLS with 125 infertile Iranian women. Confirmatory factor analysis indicated that a single-factor model provided a good fit to the data ($X^2/df = 1.58$; GFI = 0.975; CFI = 0.995; NFI = 0.985; RMSEA = 0.069 and SRMR = 0.027). In addition, the Cronbach's alpha coefficient was 0.887. Moreover, Maroufizadeh and colleagues found significant correlations between SWLS and *The Hospital Anxiety and Depression Scale* (HADS; Zigmond & Snaith, 1983) for anxiety ($r = -0.410$) and depression ($r = -0.434$) indicating acceptable convergent validity (Maroufizadeh, Ghaheri, Samani, & Ezabadi, 2016).

Table 9

SWLS Reliability Table

Test	Results
^a Two-month test-retest	0.82
^a Coefficient alpha	0.87
^b Cronbach's alpha	0.86
^c Cronbach's alpha	0.82
^d Cronbach's alpha	0.88

aDiener et al., 1985; bYardley & Rice, 1990;
cVera-Villarroel et al., 2012; dMaroufizadeh et al., 2016

The General Demographic Form

The researcher included a general demographic questionnaire that consisted of 11 questions to collect participant data. The questions related to: (a) chronological age, (b) gender, (c) race, (d) ethnicity, (e) relationship status, (f) purpose, (g) education level, (h) employment status, (i) income, (j) subjective health, and (k) hobbies. Subjective health was reported through one question, “Overall, how do you rate your current health?” Options ranged from “poor” to

“excellent” The researcher selected the demographic variables because they were commonly used in similar research studies (see Kotter-Grühn et al., 2015; Mock & Eibach, 2011; Stephen, Sutin, Caudroit, & Terracciano, 2016).

Research Design

The current investigation utilized three independent (IV) and one dependent variable (DV) for analysis. Selecting the appropriate variables to measure are important as regression models will perform optimally when each IV is strongly correlated with the DV, but uncorrelated with one another (Tabachnick, 2013). In addition, the most reliable independent variables must be selected, as regression analysis generally assumes the independent variables are measured without error, albeit an impossibility in social sciences (Tabachnick, 2013).

Dependent Variable

The researcher selected QoL as the dependent (criterion) variable for the current study. Since an individual’s sense of well-being can arise from satisfaction or dissatisfaction in the areas of life important to him or her, measuring life satisfaction as an indicator of QoL is ideal (Theofilou, 2013). Therefore, for the current study, QoL (as measured by SWLS; Diener et al., 1985) was defined as one’s level of satisfaction with his or her life (Ferrans, 1990). The SWLS is comprised of five questions and gives a total score, with scores ranging from 5-35.

Independent Variables

The researcher utilized the total scores for SA, PF, and depression resulting in three independent (predictor) variables. The construct of SA (as measured by the CAS; Barak, 1979,

Barak & Schiffman, 1981) is comprised of four questions and includes four age dimensions: (a) emotional, (b) biological, (c) societal, and (d) intellectual. The construct of PF (as measured by the APTS; Shen et al., 2014a) includes three subscales: (a) fun-seeking, (b) uninhibitedness, and (c) spontaneity. The APTS has 19 questions with scores ranging from 19-133. The construct of depression (as measured by the GDS; Brink et al., 1982) is designed to measure depressive symptoms and to differentiate depression from dementia. There are no reported subscales for the GDS. The GDS has 15 questions, with scores ranging from 0-15.

Preliminary Findings

Before testing the multiple regression model, the researcher determined the relationships between the study variables (e.g., SA, PF, depression, and QoL) using Person Product-Moment Correlation. Running correlations was important as relationships between SA and PF have yet to be established in counselor education literature.

Research and Exploratory Questions

The primary aim of the current investigation was to examine: To what extent SA (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question, PF (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among aging adults (55+)? The researcher conducted follow-up Hierarchical Multiple Regression analyses to answer the secondary research question 1.A, which

determined if after controlling for the possible effect of depression, if subjective age and playfulness still predicted a significant amount of the variance in overall QoL among adults 55 and older.

In addition, for the secondary research question 1.B, the researcher determined to what extent subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among aging adults (55+) for each group of recruited participants (e.g., face-to-face and online).

In addition, there were two exploratory questions that the researcher sought to answer. The researcher determined the answers by studying mean differences among instrument scores. For the first exploratory question, the researcher investigated if there was a difference between aging adults' (a) SA (as measured by the CAS [Barak, 1979; Barak & Schiffman, 1981] and a single item, (b) PF (as measured by the APTS [Shen et al., 2014a]), (c) depression (as measured by the GDS [Brink et al., 1982]), and QoL (as measured by SWLS [Diener et al., 1985]) based on the data collection method (e.g., online or F2F)? The second exploratory question was to determine if there was a difference between aging adults' (a) SA (as measured by the CAS [Barak, 1979; Barak & Schiffman, 1981] and a single item question, (b) PF (as measured by the APTS [Shen et al., 2014a]), (c) depression (as measured by the GDS [Brink et al., 1982]), QoL (as measured by SWLS [Diener et al., 1985]) and their reported demographic variables (e.g., race, gender, age).

Data Analysis Plan

Data analysis included: (a) preliminary analysis, (b) determining the best fit for the equation, and (c) using the regression equation to determine prediction. Preliminary analyses included cleaning the data and testing for all eight assumptions. The researcher discusses the following data analysis steps in the next section.

Preliminary Analysis

Prior to testing the model, it is recommended to clean and screen the data (Osborne, 2013). Screening the data can be done by: (a) checking distributions (e.g. missing values, normality, and univariate outliers), (b) taking care of missing data and outliers, and (c) checking pairwise plots for nonlinearity and heteroscedasticity (Tabachnick & Fidell, 2013). When appropriate, the researcher screened the data using both ocular tests (e.g., visually inspecting histograms and P-P Plots) and normality statistics (Osborne, 2013). After cleaning and screening the data (e.g., analyzing missing data and removing univariate and multivariate outliers), the researcher tested all eight general assumptions for multiple regression to identify and address violations within the data.

Standard Multiple Regression

Multiple regression can be used to predict the value of one variable when the values of other variables are known, or to determine how much of the variation in the dependent variable can be explained by the independent variables (Laerd Statistics, 2015). In other words, multiple regression can be used to determine how much SA, PF, and depression predict QoL and/or how

much of the variation in QoL can be explained by those three variables. First however, to run a multiple regression, the researcher determined that all eight assumptions had been met.

Assumptions in Multiple Regression

The eight assumptions in multiple regression allow a researcher to: (a) provide accurate information regarding predictions, (b) determine how well the equation fits the data, (c) see the variation in the dependent variable, and (d) test hypothesis on the regression equation (Laerd Statistics, 2015). The first two assumptions refer to overall study design and require a continuous dependent variable (assumption one) and two or more continuous or categorical independent variables (assumption two). The remaining six assumptions are: (a) independence of observations (using the Durbin-Watson statistic to determine if observations are unrelated); (b) having a linear relationship between the dependent variable and each independent variable individually and collectively (determined using a scatterplot and a partial regression plot); (c) homoscedasticity of residuals (checking that the residuals are equal for all values of the dependent variable); (d) no multicollinearity (when two or more variables are highly correlated to each other); (e) no significant outliers; and (f) ensuring that residuals are normally distributed (determined through a histogram and P-P Plot or Normal Q-Q Plot; Laerd Statistics, 2015).

Steps in Multiple Regression

There are at minimum, 12 steps that need to be run for multiple regression. The first step in multiple regression is to check that assumptions one and two have been met. The second step is to set up the data (entering dependent and independent variables) in a statistical analysis program such as the Statistical Package for the Social Sciences (SPSS). The third step, generally

a 12-step procedure itself, is to run the data for the remaining six assumptions. The fourth step involves making decisions related to the analysis output from the third step. For instance, examining the output to decide if the third assumption has been met. If there is not independence of observations (a violation of assumption three), then running another test such as the time-series methods would need to be conducted (Laerd Statistics, 2015). The fifth step requires analyzing the linear relationship, and the sixth step involves deciding if there is a linear relationship. If there is a linear relationship between the dependent variable and the independent variables, then step seven is to assess whether the variances along the regression line is the same for all values of the predictor variable (e.g., homoscedasticity). If the assumption for homoscedasticity has not been met, running a weighted least-squares regression instead can be conducted. The eighth step is to determine that there is no multicollinearity, meaning the independent variables are not highly correlated with each other, if there is no multicollinearity, then the ninth step is to check for outliers. If there are outliers than an option is to remove those cases and rerun the analysis, if there are no outliers than the tenth step is to assess for normality by looking at the P-P Plot or Q-Q Plot. The 11th step is deciding if the residuals are approximately normally distributed. If they are, then the 12th step is to interpret the analysis by determining how well the regression equation fits the data (Laerd Statistics, 2015).

Ethical Considerations

Ethical considerations of importance were reviewed by the researcher's IRB and dissertation committee which included the following:

1. The confidentiality and anonymity of participant data.

2. Voluntary participation in the study.
3. Informed consent for the participants which included rights for withdrawal from the study without consequence, and approval of the study by the IRB.
4. Permission and approval to conduct the proposed study from the dissertation chair, committee members, and the IRB at the University of Central Florida.

Study Limitations

There were a few limitations and/or challenges to the current investigation. First, prior to the analysis, the researcher anticipated missing data as a potential challenge. Missing data can limit the statistical power and create biased estimates which can ultimately lead to false inferences (Kang, 2013). Missing data can occur if participants do not answer every question or if the online platform used to host the survey allows participants to move forward when skipping a question. The researcher corrected this limitation by ensuring each question had an answer or preventing online participants from moving forward if they skipped a question. For the F2F participants who had missing data, the researcher ran a Missing Values Analysis to determine the pattern of missing data (Tabachnick & Fidell, 2013). Depending on if the data is missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR) determined the researcher's next steps (Rubin, 1976).

Another limitation was threats to internal validity which would limit a researcher's ability to infer relationships among the independent and dependent variables (Gall et al., 2007). Although there are several types of threats to internal validity, a potential threat that is applicable to survey research and therefore, the current study, relates to the rigor of the instruments

selected. In other words, selecting instruments that are reliable and valid. Furthermore, potential response bias and/or survey fatigue were also threats to internal validity. To combat these potential threats, the researcher conducted a critical review of the literature regarding the instruments selected for this study and selected instruments that consistently demonstrated high reliability and validity across a variety of studies. In addition, the researcher limited the number of questions being asked (56 questions including demographic questions), as well as conducted a pilot test to catch errors and determine how long the survey would take future participants.

Threats to external validity can limit a researcher's ability to generalize the study's results (Gall et al., 2007). Thus, because the researcher utilized a convenience sampling method in the current study, results may not generalize to other aging adults. However, since the researcher used an online platform such as MTurk, the findings may be applicable to a broader range of individuals. For example, if participants located around the U.S. and the world have similar demographics and responses to participants recruited locally and face-to-face, there may be a higher chance of generalizability.

Chapter Summary

The study examined the association between SA, PF, depression, and QoL. Chapter three provided an outline for the current research methods including: (a) research design, (b) sample size estimation, (c) instrumentation, (d) dependent and independent variables, (e) exploratory research questions, and (f) data analysis plan. The study sought to utilize data collected from both F2F and online modalities with adults 55 and older. Additionally, the instruments selected (e.g. CAS, single item question, APTS, GDS, and SWLS) demonstrated sound psychometric

properties in prior research and fit the constructs as defined by the researcher. The chapter presented challenges and ethical considerations and concluded with a brief outline of the assumptions that need to be met for multiple regression as well as the steps necessary to complete the test.

CHAPTER FOUR: RESULTS

In chapter four the researcher includes statistical results of the primary research and exploratory questions of this research study. The primary aim of this study was to explore the relationships between subjective age, playfulness, depression, and quality of life among adults 55 and older. The researcher utilized standard multiple regression to analyze the primary and exploratory research questions and will present the results in the following order: (a) the primary research question along with the exploratory questions, (b) sampling and data collection procedures, (b) initial descriptive statistics, (c) data screening and statistical assumptions for multiple regression, and (d) data analysis of the primary research question and exploratory questions.

The purpose of the study was to investigate the degree to which subjective age (as measured by the CAS [Barak, 1979; Barak & Schiffman, 1981], and a single item question), playfulness (as measured by the *APTS* [Shen et al., 2014a]), and depression (as measured by the GDS [Brink et al., 1982]) could predict quality of life (as measured by the SWLS [Diener et al., 1985]) among adults 55 and older. Moreover, the researcher investigated the primary research question in more depth by using hierarchical multiple regression to determine which variable predicted more variance in the model, and standard multiple regression for each sub-group of participants recruited (e.g., online and F2F). Outside of the primary research question, the researcher had two additional exploratory questions. The first exploratory question was to determine if there were differences between aging adults' (a) subjective age, (b) playfulness, (c) depression, and (d) quality of life based on the data collection method (e.g., online or F2F). The second exploratory question was to determine if there were differences between SA, PF,

depression, and QoL based on demographic characteristics (e.g., gender, race, sense of purpose, hobbies, education, and subjective health).

Reliability of Instruments

The researcher constructed a questionnaire totaling 56 questions to measure the constructs of SA, PF, depression, and QoL. With these data, the researcher checked for internal consistency using Cronbach's alpha. Reliability analysis in SPSS revealed that for, SA, the single item question using proportional discrepancy scores had a lower level of internal consistency ($\alpha = .628$), while the CAS (Barak, 1979; Barak & Schiffman, 1981), with four questions, had a higher level of internal consistency ($\alpha = .854$). Playfulness (as measured by the APTS [Shen et al., 2014a]), consisted of 19 questions, and had a high level of internal consistency ($\alpha = .891$). Depression (as measured by the GDS [Brink et al., 1982]) consisted of 15 items, and had a high level of internal consistency ($\alpha = .853$). The final construct, Quality of Life (as measured by the SWLS (Diener et al., 1985)) consisted of five items, and had a high level of internal consistency ($\alpha = .904$).

Sampling and Data Collection Procedures

Aging adults (55+) were the target population of this study. Thus, the researcher utilized convenience sampling with the following inclusion criteria: (a) speaking and reading English, and (b) 55 or older. Although the researcher was aiming to recruit 220 participants to complete the survey to ensure a minimum of 110 useable surveys, the researcher obtained an overall sample of 1,435 participants which yielded 1,315 usable surveys.

The researcher used two recruitment methods including: (a) an online-based survey delivered to individuals through Amazon Mechanical Turk (MTurk), and members of a senior education program in Central Florida, and (b) face-to-face (F2F) administration. Amazon Mechanical Turk offers researchers access to participants from around the world (Buhrmester et al., 2011), while the senior education program is a learning institute for elders, consisting of approximately 700 members over the age of 50 who are based in the Central Florida area (R. Tucker, personal communication, December 8, 2017). In addition, the researcher recruited F2F participants through personal and professional contacts, which included individuals from: (a) retirement communities in Orlando and New Jersey (c) senior centers, (d) libraries, (e) clubs, and (f) churches in California, Alabama, and Florida. Utilizing a diverse sample throughout the U.S. as well as worldwide, provided strong geographic representation.

Approval from the researcher's IRB was received on December 5, 2017 and data collection for MTurk was initiated on December 6, 2017. Participants registered to work for MTurk were able to view the title of the research study and click on the link available leading them to the survey which included: (a) an informed consent, (b) a general demographic form, and (c) assessment instruments (e.g., CAS [Barak, 1979; Barak & Schiffman, 1981], APTS [Shen et al., 2014a]; GDS [Brink et al., 1982] and SWLS [Diener et al., 1985]). Participants who completed the survey received \$.50. Data collection for MTurk closed on January 19, 2018, allowing for an approximate six-week window of opportunity for individuals online to participate.

The senior education program requested their members be surveyed online to streamline the process (R. Tucker, personal communication, December 8, 2017). Therefore, data collection

for members began Tuesday, January 15, 2018, a week after classes resumed and closed on Friday, January 19, 2018. The timeline for the senior education program was shorter as Friday, January 19 was the cut-off date for data collection (as agreed upon by chair and researcher).

Face-to-face data collection began December 7, 2018 and ended on January 19, 2018. Face-to-face recruitment had an approximate five-week timeline due to winter holidays. The researcher scheduled dates with individuals who were members of different social clubs, managers at different retirement locations, and pastors of churches. The researcher selected locations for recruitment based on willingness and availability of recruitment site. When the primary researcher was logistically unavailable to distribute surveys (e.g., distributing surveys in a church in Southern California and a retirement community in New Jersey), the researcher mailed surveys with return postage to a point-person in both of those locations to distribute to interested individuals. The researcher was able to attend a church in Huntsville, Alabama to recruit participants who were more racially diverse. Two retirement communities in Central Florida preferred to distribute the surveys themselves and return the filled out the surveys to the researcher (J. Ricci, personal communication January 3, 2018; D. Phillips, personal communication, January 5, 2018). In other instances, the researcher emailed a PDF fillable version of the questionnaire to friends and family who lived out of state. The researcher worked to ensure heterogeneity of gender, race, ethnicity, and SES in the F2F sample.

Response Rate

Although response rates were difficult to calculate for the online respondents (e.g., MTurk and senior educational program), the researcher examined response rates through survey

completion rates. Response rates (number of responses divided by number of invited responses) for online populations are difficult to accurately determine due to the unavailable number of those invited to participate (Couper, 2000), survey completion rates were instead calculated. The following sections separate the results between online survey completion rates and F2F response rates.

Online Surveys

Response rates for surveys collected using web-based platforms such as MTurk are difficult to identify as there is no way for the researcher to know how many individuals actually saw the survey and/or received an invitation to take the survey. While there are approximately 7,300 unique participants working with MTurk (Stewart et al., 2015), and 700 individuals affiliated with the senior educational program (R. Tucker, personal communication, December 8, 2017), there is no way of isolating how many of those participants saw the survey, thereby preventing an accurate response rate. The researcher can however, identify how many individuals *initiated* the surveys (e.g., opened or started the survey but did not finish) and can therefore, determine how many surveys were completed once initiated, thereby estimating a survey completion rate.

MTurk

A total of 884 surveys were initiated with 859 being completed resulting in a survey completion rate of 97.17%. Of the 859 surveys completed, several participants ($n = 51$) were removed as they had taken the survey multiple times (e.g. same IP address with the same

demographic answers and very similar survey responses). Thus, recruitment through MTurk resulted in 808 (91.4%) usable responses.

Senior Educational Program

A total of 142 surveys were initiated with 130 being completed resulting in a survey completion rate of 91.5%. Twelve participants were removed due to responses that were incomplete (e.g., started the survey but did not complete it), resulting in 130 (91.5%) useable responses.

Face-to-Face Surveys

The researcher created 600 printed surveys. The researcher scheduled dates with different churches, senior centers, retirement and/or apartment communities, libraries, and social clubs to distribute surveys to individuals. Of the 600 surveys created, 521 were actually distributed (79 remained undistributed), and 379 surveys were returned and completed (72.74% response rate). Not included in the 379 returned surveys were an additional 33 surveys received (25 from one senior apartment complex, two from a senior center that had photocopied the survey and distributed them among their residents and patrons, and six PDF-fillable versions emailed from the researcher's friends and family). Therefore, total surveys from F2F data collection was 412 (79%). Several participants ($n = 35$; 8.4%) were removed due to incomplete responses and/or who did not meet eligibility requirements (e.g., younger than 55). Thus, recruitment from F2F collections resulted in 377 (91.5%) usable responses (see Table 10).

Table 10

Sampling and Response Rates

	Participant Responses (<i>N</i>)	Participants Invited	Response Rate	Useable Responses (<i>n</i>)	Usable Response Rate
Data Source					
MTurk	884	--	--	808	91.40%
Senior Edu. ^a	142	--	--	130	91.54%
Face-to-Face	412	521	72.74% ^b	377	91.50%
Total	1,438			1,315	91.58%

Note. ^aSenior Educational Program. ^bResponse rate is lower because it is calculated from the 379 surveys returned, which excludes the 33 given via photocopy or PDF fillable.

Participant Demographic Information

Data collection resulted in a final sample of 1,315 adult participants over the age of 55. More than half of the participants identified themselves as female ($n = 866$; 65.9%) compared to male ($n = 449$; 34.1%). In addition, the majority (89.2%) of the participants were between the ages of 55-75. A specific breakdown of the ages revealed: (a) 55-60 ($n = 411$; 31.3%); (b) 61-65 ($n = 343$; 26.1%); (c) 66-70 ($n = 250$; 19.0%); (d) 71-75 ($n = 169$; 12.9%); (e) 76-80 ($n = 73$; 5.6%); (f) 81-85 ($n = 38$; 2.9%); (g) 86-90 ($n = 25$; 1.9%); (h) 91+ ($n = 6$; .5%). The majority of the participants identified as Caucasian ($n = 1,051$; 80%) while other participants reported that they were: (a) American Indian or Alaskan Native ($n = 6$; .5%); (b) Asian ($n = 39$; 3.0%); (c) Bi-racial/Multi-racial ($n = 39$; 3.0%); (d) Black or African-American ($n = 161$; 12.3%); (e) Native Hawaiian or other Pacific Islander ($n = 1$; 1%); and (f) Other, who wrote in as identifying as Latino/a and/or Hispanic ($n = 16$; 1.2%). Regarding ethnicity, the majority of participants identified as non-Hispanic ($n = 1,227$; 95.8%) compared to participants who identified as Hispanic ($n = 55$; 4.2%).

The largest percentage of participants had a Bachelor's degree ($n = 365$; 27.8%) compared to those who reported: (a) some college, no degree ($n = 277$; 21.1%); (b) a master's degree ($n = 258$; 19.6%); (c) an associate degree ($n = 150$; 11.4%); (d) a high school degree or equivalent ($n = 128$; 9.7%); (e) a doctorate ($n = 79$; 6.0%); (f) a professional degree ($n = 33$; 2.5%); and (g) less than a high school diploma ($n = 25$; 1.9%). Moreover, the majority of the participants reported being retired ($n = 725$; 55.2%) as compared to those who reported employment status as: (a) full-time ($n = 348$; 26.5%); (b) part-time ($n = 195$; 14.8%); and (c) seasonal/temporary ($n = 46$; 3.5%). Data on income is unavailable due to error on scale.

In addition, the majority of participants reported their current relationship status to be married or in a committed relationship ($n = 801$; 60.9%) as compared to those who reported being single ($n = 351$; 26.7%) or widowed ($n = 163$; 12.4%). In addition, an overwhelming number of participants reported they felt their life had purpose ($n = 1,214$; 92.3%) as compared to those who reported their life did not ($n = 101$; 7.7%). Moreover, the majority of participants ($n = 931$; 70.9%) reported to experiencing good to very good health as compared to participants who reported having: (a) "fair" health ($n = 224$; 17.0%); (b) "excellent" health ($n = 132$; 10%); and (c) "poor" health ($n = 27$; 2.1%). Also, the majority of participants ($n = 728$; 55.6%) reported engaging in 1-2 hobbies/week, as compared to participants ($n = 433$; 33.1%) who reported 3-4 hobbies a week, and participants ($n = 149$; 11.4%) who reported 5+ hobbies a week (see Table 11).

Table 11

Participants' Demographic Characteristics

Characteristics	<i>n</i>	Total Percent
Gender		
Female	866	65.9%
Male	449	34.1%
Ethnicity		
Non-Hispanic	1,227	95.8%
Hispanic	54	4.2%
Race		
Caucasian	1,051	80%
American Indian/Alaskan Native	6	.5%
Asian	39	3.0%
Bi-racial/Multi-racial	39	3.0%
Black or African American	161	12.2%
Hawaiian or Pacific Islander	1	.1%
Other (Latino/a or Hispanic)	16	1.2%
Age		
55-60	411	31.1%
61-65	343	26.1%
66-70	250	19.0%
71-75	169	12.9%
76-80	73	5.6%
81-85	38	2.9%
86-90	25	1.9%
91+	6	.5%
Relationship		
Married or in relationship	801	60.9%
Single	351	26.7%
Widowed	163	12.4%
Highest Degree Earned		
Bachelor's Degree	365	27.8%
Less than HS Diploma	25	1.9%
HS Degree or equivalent	128	9.7%
Some College, no degree	277	21.1%
Associate Degree	150	11.4%
Master's Degree	258	19.6%
Professional Degree	33	2.5%
Doctorate	79	6.0%
Employment Status		

Characteristics	<i>n</i>	Total Percent
Retired	725	55.2%
Full-time	348	26.5%
Part-time	195	14.8%
Seasonal/Temporary	46	3.5%
Current Health		
VG/Good	931	70.8%
Poor	27	2.1%
Fair	224	17.0%
Excellent	132	10.1%
Hobbies/Week		
1-2	728	55.6%
3-4	433	33.1%
5+	149	11.4%
Purposeful Life		
Yes	1,214	92.3%
No	101	7.7%

Note. Some demographic variables do not add up to 1,315 as they contain missing cases.

In addition, the majority of individuals reported they felt *younger* than their actual age. To report on SA as a demographic variable, the researcher used the CAS instrument as it had the least amount of missing data compared to the single item question (e.g., missing five responses compared to 70). As a result, the majority of participants ($n = 862$; 65.9%) reported feeling between 1% to 78% *younger* than their actual age, while a minimal number of participants ($n = 58$; 4.4%) reported feeling the same as their actual age, and the remaining participants ($n = 390$; 29.58%) reported feeling between 1% to 40% *older* than their actual age (see Table 12).

Table 12

Participants' Subjective Ages

Felt Age to Actual Age*	<i>n</i>	Total Percent
70% - 78% younger	2	.152%
60% - 69% younger	2	.152%
50% - 59% younger	4	.305%
40% - 49% younger	16	1.22%
30% - 39% younger	60	4.58%
20% - 29% younger	170	12.9%
10% - 19% younger	297	22.6%
1% - 9% younger	311	23.7%
Same as actual age	58	4.42%
1% - 9% older	224	17.0%
10% - 19% older	125	9.54%
20% - 29%	36	2.74%
30% - 37%	4	.305%
40% older	1	.076%
Total	1310	

Note. *Missing 5 responses.

Online and Face-to-Face Participants

Analysis of demographic information between the online participants ($n = 938$) and the F2F participants ($n = 377$) demonstrated a significant amount of similarity among the demographic variables, lending to the generalizability of the findings from this investigation to the aging adult population at large. Differences between the F2F and online group included more racial diversity in the F2F sample and younger participants in the online sample (see Table 13).

Table 13

Face-to-Face and Online Respondents Demographic Characteristics

Characteristics	<i>F2F</i>	Total Percent	<i>Online</i>	Total Percent
Gender				
Female	250	66.3%	616	65.7%
Male	127	33.7%	322	34.3%
Ethnicity				
Non-Hispanic	320*	93.3%	907	96.7%
Hispanic	23	6.7%	31	3.3%
Race				
Caucasian	222*	59.2%	829	88.4%
American Indian/Alaskan Native	4	1.1%	2	.2%
Asian	5	1.3%	34	3.6%
Bi-racial/Multi-racial	26	6.9%	13	1.4%
Black or African American	111	29.6%	50	5.3%
Hawaiian or Pacific Islander	0	0%	1	.1%
Other (Latino/a or Hispanic)	7	1.9%	9	1%
Age				
55-60	74	19.6%	337	35.9%
61-65	59	15.6%	284	30.3%
66-70	73	19.4%	177	18.9%
71-75	74	19.6%	95	10.1%
76-80	43	11.4%	30	3.2%
81-85	29	7.7%	9	1.0%
86-90	19	5.0%	6	.6%
91+	6	1.6%	0	0%
Relationship				
Married or in relationship	228	60.5%	573	61.1%
Single	77	20.4%	274	29.2%
Widowed	72	19.1%	91	9.7%
Highest Degree Earned				
Bachelor's Degree	84	22.3%	281	30%
Less than a HS Diploma	15	4.0%	10	1.1%
HS Degree or equivalent	32	8.5%	96	10.2%
Some College, no degree	70	18.6%	207	22.1%
Associate Degree	37	9.8%	113	12.0%
Master's Degree	89	23.6%	169	18.0%

Characteristics	<i>F2F</i>	Total Percent	<i>Online</i>	Total Percent
Professional Degree	16	4.2%	17	1.8%
Doctorate	34	9.0%	45	4.8%
Employment Status				
Retired	229*	60.9%	496	52.9%
Full-time	113	30.1%	235	25.1%
Part-time	28	7.4%	167	17.8%
Seasonal/Temporary	6	1.6%	40	4.0%
Current Health				
VG/Good	286*	76%	645	68.7%
Poor	4	1.1%	23	2.5%
Fair	44	11.7%	180	19.2%
Excellent	42	11.2%	90	9.6%
Hobbies/Week				
1-2	197*	53%	531	56.6%
3-4	125	33.6%	308	32.8%
5+	50	13.4%	99	10.6%
Purposeful Life				
Yes	367	97.3%	847	90.3%
No	10	2.7%	91	9.7%

**Note.* Missing responses for the entire variable.

Data Screening and Statistical Assumptions for Multiple Regression

To investigate the primary research question and exploratory questions, the researcher used standard multiple regression as the primary data analysis procedure. The researcher entered in by hand all F2F surveys, going over each survey twice to ensure that information was entered into SPSS accurately. Total scores for SA, PF, depression, and QoL were calculated using mathematical formulas in Excel and then copied back into SPSS. Once all the data for F2F had been entered in and formulated, the researcher downloaded the survey responses from Qualtrics (i.e., online platform that hosted surveys for both MTurk and the senior educational program

participants) and recoded all the data for MTurk and the senior educational program participants. Once all three data points (e.g., F2F, MTurk, and the senior educational program) were collated, coded similarly, and totaled, the researcher checked for errors. The researcher screened and cleaned the data examining the data set for missing values, identifying outliers, and testing the assumptions of standard multiple regression. In the following section the researcher presents the results of these analyses.

Error Checking

Errors can distort results, therefore the researcher created frequency tables for every variable and checked for errors by looking for outliers. Four errors were found that included either incorrect responses or data entry. The researcher resolved those errors (e.g., entered in correct information) and ran frequency tables again to ensure all errors found had been corrected. Once they had been resolved, the researcher checked for missing values.

Missing Values Analysis

Although the survey hosted online was configured to “force responses” from participants to prevent missing data, there were errors in the answers provided for one of the SA scales (single item question). When participants were asked to write down the age they felt, many responded with the word, “younger,” which resulted in data that was treated as missing. In addition, there was missing data with the F2F participants. As such, the researcher examined each independent and dependent variable used in the study for missing values.

The researcher utilized the explore feature in Descriptive Statistics in SPSS to determine the percentage of overall missing data. Overall missing data was found to be less than 5%. In

addition, Little's test in SPSS was run to determine whether the missing cases were missing completely at random (MCAR), missing at random (MAR), or missing not at random (MNAR; Little, 1998). Results from the test indicated that all tests with the exception of the single item question and GDS were significant, thereby resulting in data missing at random (MAR; Bai, 2017). Specifically, the results of Little's test revealed the missing data of PF (*Chi-Square* = 2130.282, *df* = 586, *p* = .000); CAS (*Chi-Square* = 159.466, *df* = 20, *p* = .000); and QoL (*Chi-Square* = 247.932, *df* = 20, *p* = .000), were significant and therefore, MAR. Results from Little's MCAR test indicated that the missing data of the single item question (*Chi-Square* = 9.209, *df* = 4, *p* = .056) and GDS (*Chi-Square* = 253.910, *df* = 273, *p* = .790) were *not* significant, thereby resulting in data MCAR. Therefore, the missing data was established to be either MAR or MCAR, which indicated that the missing data was random, therefore not anticipated to influence analysis (Osborne, 2013). While there are no set rules for how to handle missing data, Kline (2011) stated that a few missing variables, approximately 5% or less on one variable in a large sample may not be a concern. In addition, Schafer and Olsen (1998) stated that for missing variables that are extremely low (less than 0.5%), including them without transformation will not distort their distributional shapes. There are three ways to handle missing data: (a) listwise deletion, (b) pairwise deletion, and (c) replacing missing values (Shumacker & Lomax, 2010). Listwise deletion is the "most robust to violations of MAR among independent variables in a regression analysis" (Allison, 2002, p.6). In other words, since the missing data on the independent variables do not depend on the values of the dependent variable, estimates using listwise deletion will be unbiased (Allison, 2002). Therefore, due to the large sample size of the

dataset for this research study, and the minimal amount of data missing (< 5%), listwise deletion was deemed the best practice.

Univariate and Multivariate Outliers

Extreme cases can have too much of an impact on the regression solution and can also impact the precision of regression (Fox, 1991). As such, screening for outliers should be performed prior to running a regression (Tabachnick & Fidell, 2013). Therefore, the researcher tested for univariate outliers within the continuous variables. Tabachnick and Fidell (2013) stated that for continuous variables univariate outliers are cases with z scores that were very large (greater than 3.29). The total PF and QoL scores had no identified univariate outliers. The single item question scores had eight identified outliers, the CAS had three, and the GDS scores had two univariate outliers. Therefore, in all, 13 univariate distinct outliers were identified, and based on the recommendation of Tabachnick and Fidell (2013), the researcher excluded those cases from analyses (see Table 14).

Table 14

Univariate Outliers for Continuous Variables

Variable	Case Number	Z Score
I-item Score	78	7.81
	69	4.81
	70	4.65
	71	4.63
	72	4.50
	76	4.35
	73	3.81
	74	3.68
CAS Score	90	7.77
	326	3.40
	1098	3.09
GDS Score	838	3.54
	401	3.54

In addition to univariate outliers, the researcher also tested the dataset for multivariate outliers using the Mahalanobis distance. Mahalanobis distance is one measure of multivariate distance and a conservative probability estimate for a case being an outlier is $p < .001$ for the Chi Square value (Tabachnick & Fidell, 2013). Thus, for the current study, the critical value of Chi Square with four degrees of freedom was 18.46 (Tabachnick & Fidell, 2013). Analyses of the values revealed 22 potential multivariate outliers which were excluded from the analyses.

Table 15

Multivariate Outliers for Continuous Variables

Case Number	X^2	Case Number	X^2
1312	70.14	1132	19.94
1288	43.79	1311	19.76
1285	34.58	820	19.81
135	32.56	1304	19.31
1310	28.38	1275	19.06
1196	27.80	117	18.90
77	27.40	1235	18.79
278	25.19	1234	18.60
173	24.71	170	18.91
1139	20.67	1316	18.85
1287	20.24	1290	18.60

Statistical Assumptions

Multiple regression has eight statistical assumptions that should not be violated (Laerd Statistics, 2015; Pallant, 2013; Tabachnick & Fidell, 2013). If a violation occurs, corrections need to be made and assumptions retested. If the assumptions are still violated, then a different statistical test must be selected. The assumptions of multiple regression are important as they allow for: (a) accuracy of predictions, (b) testing how well the regression model fits the data, and (c) determining the variation in the dependent variable as explained by the independent variables (Laerd Statistics, 2015; Pallant, 2013).

Assumption One: Continuous Dependent Variable. The dependent variable must be measured at the continuous level (Laerd Statistics, 2015). The dependent variable (e.g., QoL) was a total score derived from a seven-point Likert scale, which was treated as a continuous variable. When a Likert scale contains seven or more values (e.g., “strongly agree” to “strongly disagree”) the underlying scale can be treated as continuous (Laerd Statistics, 2015).

Assumption Two: Two or More Continuous or Nominal Independent Variables. The independent variables must be measured either at the continuous or nominal level (Laerd Statistics, 2015). Playfulness and depression were measured at the ordinal level but were treated as continuous variables. Variables measured at the ordinal level in a multiple regression can be treated as either a continuous or nominal variable (Laerd Statistics, 2015). Therefore, the researcher treated all independent variables (e.g., SA, PF, and depression) as continuous variables.

Assumption Three: Independence of Errors. The Durbin-Watson statistic measures “autocorrelation of errors over the sequence of cases and if significant, reveals non-independence of errors” (Tabachnick & Fidell, 2013, p. 128). In other words, errors must be independent and therefore, not be related. The Durbin-Watson value ranges from zero to four, with a value near two indicating non- autocorrelation, a value near zero indicating a positive autocorrelation, and a value near four indicating a negative auto-correlation (White & Savin, 1977). As such, the independence of errors, as assessed by the Durbin-Watson statistic, for the current study was 1.894, resulting in a non-violation of assumption three.

Assumption Four: Linearity. Linearity is defined as a straight-line relationship between two variables (Tabachnick & Fidell, 2013). In multiple regression there needs to be a linear relationship between the dependent variable and each of the independent variables, separately as well as collectively (Laerd Statistics, 2015). The assumptions for linearity were met, as assessed by scatterplots and partial regression plots.

Assumption Five: Homoscedasticity of Residuals. The assumption for homoscedasticity is that the residuals are equal for all of the values of the dependent variable (Laerd Statistics,

2015). The assumption for homoscedasticity was violated as assessed by the studentized residuals against the unstandardized predicted values plot. As a result, the violation resulted in heteroscedasticity. However, heteroscedasticity is not destructive to an analysis of ungrouped data (Tabachnick & Fidell, 2013). More specifically, with heteroscedastic data, “the analysis is weakened, but not invalidated” (Tabachnick & Fidell, 2013, p.85). As such, the researcher did not manipulate the data to account for heteroscedasticity.

Assumption Six: No Multicollinearity. In regression analysis, multicollinearity among the independent variables can prevent the researcher from accurately assessing the unique contribution of each predictor (Field, 2009; Tabachnick & Fidell, 2013). Therefore, to test for multicollinearity, the researcher studied the collinearity diagnostics found in coefficients tables. Menard (1995), stated that tolerance values less than 0.1 demonstrate collinearity issues. None of the predictor variables in this research study violated this assumption. Further, Myers (1990), stated that the variance inflation factor (VIF) values larger than 10 indicate multicollinearity issues. Again, none of the predictor variables violated this rule. Table 16 displays the collinearity statistics (e.g., Tolerance Values and Variance Inflation Factor Values) for each of the independent variables. Therefore, the assumption of multicollinearity was not violated.

Table 16

Multicollinearity Statistics

Independent Variable	Tolerance	VIF
PDS Total Score	.630	1.588
CAS Total Score	.586	1.707
PF Total Score	.849	1.178
GDS Total Score	.779	1.284

Assumption Seven: No Significant Outliers, High Leverage Points, or Highly Influential Points. The seventh assumption is to ensure that there are no significant outliers, high leverage points, or highly influential points, which can reduce the predictive accuracy of the results (Laerd Statistics, 2015; Pallant, 2013). Different from the univariate and multivariate outliers that were studied before, outliers in the seventh assumption refer to cases that interfered with model fit (Laerd Statistics, 2015). The assumption for outliers was met as the Mahalanobis Distance score was below the critical value (Mahal. Distance = 18.46; Tabachnick & Fidell, 2013) and Cook's distance was below 1.0. Tabachnick and Fidell (2013) stated that any score above 1.0 for Cook's Distance would suggest outliers and influencers. Therefore, there were no influential cases in the data set. Furthermore, there were no high leverage points as none of the cases demonstrated leverage values higher than 2.0 (Laerd Statistics, 2015).

Assumption Eight: Residuals are Normally Distributed. Two common methods to determine assumption of normality of the residuals are a histogram and P-P Plot. The final assumption, normality, was met as the residuals were normally distributed as assessed by the histogram and Normal P-P Plot (see Appendix N).

Preliminary Analysis Results

Pearson product-moment correlation coefficient was used to describe the strength and direction of the relationship between the variables used in the study (e.g., SA, PF, depression, and QoL). All assumptions were met with the exception of normality; indicating that not all variables were normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$). However, the researcher chose not to transform the variables or utilize the Spearman's rank-order correlation,

but to continue using Pearson's correlation as it is robust to deviations from normality (Laerd Statistics, 2017).

The relationship between SA (as measured by the single item question and the CAS [Barak, 1979; Barak & Schiffman, 198]), and PF (as measured by the APTS [Shen et al., 2014a]), was investigated using Pearson product-moment correlation coefficient. Using the single item question, there was a small, negative correlation between SA (as measured by the single item question) and PF, $r = -.27$, $n = 1201$, $p = .000$. Using the second measure of SA, the CAS (Barak, 1979; Barak & Schiffman, 1981), there was a medium, negative correlation between SA and PF, $r = -.33$, $n = 1201$, $p = .000$. In other words, a younger SA was associated with higher levels of playfulness.

In addition, Pearson correlation was used to investigate the relationship between SA (using both measures) and QoL (as measured by the SWLS [Diener et al., 1985]). There was a small, negative correlation between SA (as measured by the single item question) and QoL, $r = -.22$, $n = 1201$, $p = .000$. Similarly, there was a medium, negative correlation between SA (as measured by the CAS [Barak, 1979; Barak & Schiffman, 1981]) and QoL, $r = -.31$, $n = 1,201$, $p = .000$. Data demonstrated that a younger SA was associated with higher levels of QoL.

The relationship between PF and QoL was also investigated using Pearson correlation. Results indicated that there was a medium, positive correlation between PF and QoL, $r = .301$, $n = 1,271$, $p = .000$. Results identified that higher levels of PF were associated with higher levels of QoL. Furthermore, the relationship between PF and depression (as measured by the GDS [Brink et al., 1982]) was also investigated using Pearson correlation. Results indicated a small,

negative correlation between depression and PF, $r = -.29$, $n = 1,271$, $p = .000$. In other words, lower depression was associated with higher levels of PF.

The relationship between depression and QoL was also examined using Pearson correlation. Results identified a large, negative correlation between depression and QoL, $r = -.681$, $n = 1,271$, $p = .000$. Results indicated that lower levels of depression were associated with higher levels of overall QoL.

Table 17

Pearson Correlations for Subjective Age Scales, Playfulness, and Quality of Life

	Playfulness	Sig. (2-tailed)	Quality of Life	Sig. (2-tailed)
Single Item Question	-.274*	.000	-.222*	.000
Cognitive Age Scale (CAS)	-.327*	.000	-.315*	.000
Playfulness (PF)	--	--	.301*	.000
Depression	-.299*	.000	-.681*	.000

Note. *Correlation significant at 0.01 level (2-tailed).

Results of Multiple Regression Data Analysis

To determine the extent to which subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981], and a single item question), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al,1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among adults (55+), the researcher utilized multiple regression, with QoL as the dependent variable and SA, PF, and depression as predictor variables.

The multiple regression model statistically significantly predicted QoL, $F(4, 1196) = 283.094, p = .000$; adj. $R^2 = .485, f^2 = 0.94$, indicating large effects. The regression equation is expressed in the following form:

$$QoL = 25.191 + 2.918 (\text{single item question}) - 2.710 (\text{CAS}) + .040 (\text{PF}) - 1.561 (\text{GDS}).$$

The variable of SA was inconsistent between the two measures (e.g., single item question and CAS), as one measure (single item) contributed significantly to the model and the other one did not. Inconsistency may have occurred because over 70 cases were missing data from the single item question and therefore excluded, compared to CAS which was missing five cases.

Regression coefficients and standard errors can be found in Table 18 (below).

Table 18

Summary of Multiple Regression Analysis

Variable	<i>B</i>	<i>SE_b</i>	β	<i>t</i>	Sig.	Tolerance	VIF
(Constant)	25.191	.986	--	25.559	.000	--	--
1-Item Total Score	2.918	1.158	.066	2.521	.012*	.628	1.592
CAS Total Score	-2.710	1.431	-.052	-1.894	.058	.579	1.728
PF Total Score	.040	.010	.089	3.958	.000*	.853	1.173
GDS Total Score	-1.561	.055	-.665	-28.408	.000*	.784	1.275

Note. * $p < .05$; *B* = unstandardized regression coefficient; *SE_b* = Standard error of the coefficient; β = standardized coefficient.

Adjusted Regression Results

Due to item non-response (e.g., missing 70 cases), the researcher removed the single item question from the analysis. Results demonstrated that SA, PF, and depression statistically significantly predicted QoL, $F(3, 1262) = 376.273, p = .000$; adj. $R^2 = .471$, with a large effect size $f^2 = .89$. Therefore, the null hypothesis was rejected. In addition, with the level of significance at less than .001, there was a low likelihood of making a Type I error. Although the

measure for SA (e.g., the CAS), was not significant ($p = .456$), SA is a theoretically important variable to the study; as such, the SA variable as measured by the CAS remained in the regression model despite its insignificance. Therefore, the adjusted regression equation is expressed in the following form:

$$QoL = 24.207 - .886 (CAS) + .045 (PF) - 1.513 (GDS).$$

The slope coefficient (B) represents the change in the dependent variable (e.g., QoL) for a one-unit change in the independent variables (e.g., SA, PF, and depression). As such, when all other independent variables are held constant, an increase in age by one year is associated with a decrease in QoL by $-.886$. In addition, as PF increases by one unit, QoL increases by $.045$, and as depression increases by one unit, QoL decreases by -1.513 . Therefore, the multiple regression equation predicts that the older and more depressed individuals feel, the lower their QoL, while the younger and more playful individuals feel, the higher the QoL. In addition, the 95% confidence intervals (CI) for: (a) SA was between -3.217 and 1.446 ; (b) PF was between $.026$ and $.064$; and (c) depression was between -1.618 and -1.407 . In other words, although only two of the three variables were significant (e.g., PF and depression), there is 95% confidence that the true value of the slope coefficient is between those lower and upper bounds.

Therefore, the results of the regression analyses explain that R^2 for the overall model was 47.2% with an adjusted R^2 of 47.1%, with a large effect size $f^2 = 0.89$ according to Cohen (1988). Of the three variables, depression made the largest unique contribution ($beta = -.642$, $p = .000$), and PF made a small statistically significant contribution ($beta = .102$, $p = .000$). Subjective age did not statistically significantly contribute to the prediction ($beta = -.017$, $p = .456$). Regression coefficients and standard errors can be found in Table 19.

Table 19

Summary of Adjusted Multiple Regression Analysis

Variable	<i>B</i>	<i>SE_b</i>	β	<i>t</i>	Sig.	Tolerance	VIF
(Constant)	24.207	.950	--	25.479	.000	--	--
CAS Total Score	-.886	1.188	-.017	-.745	.456	.785	1.274
PF Total Score	.045	.010	.102	4.613	.000*	.861	1.161
GDS Total Score	-1.513	.054	-.642	-28.104	.000*	.801	1.248

Note. * $p < .001$; *B* = unstandardized regression coefficient; *SE_b* = Standard error of the coefficient; β = standardized coefficient.

Secondary Research Question 1.A

The researcher ran a hierarchical multiple regression to determine if the addition of SA and PF improved the prediction of QoL over and above depression alone. There was linearity as assessed by partial plots and a plot of studentized residuals against the predicted values. There was independence of residuals, as assessed by a Durbin-Watson statistic of 1.894. The assumption of homoscedasticity was violated, as assessed by a plot of studentized residuals versus unstandardized predicted values. However, there was no evidence of multicollinearity, as assessed by tolerance values greater than 0.1. Furthermore, there were no studentized deleted residuals greater than ± 3 standard deviations, no leverage values greater than 0.2, and no values for Cook's distance above 1.0. Also, the assumption of normality was met, as assessed by a Q-Q Plot. See Table 20 for full details on each regression model.

The full model of SA, PF, depression, and QoL was statistically significant, $R^2 = .472$, $F(3, 1262) = 376.273$, $p = .000$, with a large effect size, $f^2 = 0.89$. Results indicated that depression explained 46.2% of the variance in QoL, while the addition of SA and PF contributed a minimal amount of variance, 1% in QoL [$R^2 = .010$, $F(2, 1262) = 12.412$, $p = .000$, $f^2 = 0.01$].

In the final model, only one of the control variables, PF, was statistically significant, ($\beta = .102, p = .000$). Therefore, the null hypothesis is rejected with a low probability of a Type I error.

Table 20

Hierarchical Multiple Regression Predicting QoL from SA, PF, and Depression

Variable	QoL			
	Model 1		Model 2	
	<i>B</i>	β	<i>B</i>	β
Constant	28.706*	--	24.207*	--
GDS	-1.601*	-.680*	-1.513*	-.054*
CAS	--	--	-.886	-.017
PF	--	--	.045*	.102*
R^2	.462*	--	.472*	--
<i>F</i>	1084.411*	--	376.273*	--
ΔR^2	.462*	--	.010*	--
ΔF	1084.411*	--	12.412*	--

Note. $N = 1201$. * $p < .001$

Secondary Research Question 1.B

As a follow-up to the primary research question, the researcher split the sample into two groups based on recruitment, F2F and online and determined to what extent subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among aging adults (55+) for each sub-group.

Face-to-Face Participants Results

Results for the F2F participants, are outlined in the following regression equation:

$$QoL = 23.285 + 5.680 (CAS) + .072 (PF) - 1.423 (GDS).$$

The slope coefficient (*B*) represents the change in the dependent variable (e.g., QoL) for a one-unit change in the independent variables (e.g., SA, PF, and depression). As such, when all other independent variables are held constant, an increase in age by one year is associated with an increase in QoL by + 5.680. In addition, as PF increases by one unit, QoL increases by .072, and as depression increases by one unit, QoL decreases by -1.423. Therefore, the multiple regression equation predicts that for the F2F participants, the older and more playful individuals feel, the higher their QoL, while the more depressed individuals feel, the lower the QoL. In addition, the 95% confidence intervals (CI) for: (a) SA was between .856 and 10.504; (b) PF was between .040 and .104; and (c) depression was between -1.795 and -1.051. In other words, all three variables were statistically significant and there is 95% confidence that the true value of the slope coefficient is between those lower and upper bounds.

Therefore, the results of the regression analyses explain that R^2 for the overall model was 19.5% with an adjusted R^2 of 18.9%, with a medium effect size $f^2 = 0.24$ according to Cohen (1988). Of the three variables, depression made the largest unique contribution ($beta = -.378$, $p = .000$), PF made the second largest contribution ($beta = .216$, $p = .000$), and SA made the third largest contribution ($beta = .117$, $p = .021$). Regression coefficients and standard errors can be found in Table 21.

Table 21

Summary of F2F Multiple Regression Analysis

Variable	<i>B</i>	<i>SE_b</i>	β	<i>t</i>	Sig.	Tolerance	VIF
(Constant)	23.285	1.691	--	13.769	.000	--	--
CAS Total Score	5.680	2.453	.117	2.316	.021*	.911	1.098
PF Total Score	.072	.016	.216	4.408	.000*	.960	1.042
GDS Total Score	-1.423	.189	-.378	-7.517	.000*	.916	1.092

Note. * $p < .001$; *B* = unstandardized regression coefficient; *SE_b* = Standard error of the coefficient; β = standardized coefficient.

Online Participants Results

Results for the online participants, are outlined in the following regression equation:

$$QoL = 25.211 - .743 (CAS) + .031 (PF) - 1.524 (GDS).$$

The slope coefficient (*B*) represents the change in the dependent variable (e.g., QoL) for a one-unit change in the independent variables (e.g., SA, PF, and depression). As such, when all other independent variables are held constant, an increase in age by one year is associated with a decrease in QoL by -.743. In addition, as PF increases by one unit, QoL increases by .031, and as depression increases by one unit, QoL decreases by -1.524. Therefore, the multiple regression equation predicts that for the online participants, the younger and more playful individuals feel, the higher their QoL, while the more depressed individuals feel, the lower their QoL. In addition, the 95% confidence intervals (CI) for: (a) SA was between -3.877 and 2.391; (b) PF was between .008 and .055; and (c) depression was between -1.640 and -1.407. In other words, although only two of the three variables were significant (e.g., PF and depression), there is 95% confidence that the true value of the slope coefficient is between those lower and upper bounds.

Therefore, the results of the regression analyses explain that R^2 for the overall model was 48.9% with an adjusted R^2 of 48.7%, with a large effect size $f^2 = 0.95$ according to Cohen (1988).

Of the three variables, depression made the largest unique contribution ($beta = -.671, p = .000$), with PF making a smaller statistically significant contribution ($beta = .068, p = .000$). Subjective age was insignificant ($beta = -.012, p = .642$). Regression coefficients and standard errors can be found in Table 22.

Table 22

Summary of F2F Multiple Regression Analysis

Variable	<i>B</i>	<i>SE_b</i>	β	<i>t</i>	Sig.	Tolerance	VIF
(Constant)	25.211	1.171	--	21.527	.000	--	--
CAS Total Score	-.743	1.597	-.012	-.465	.642	.806	1.241
PF Total Score	.031	.012	.068	2.607	.009*	.845	1.184
GDS Total Score	-1.524	.059	-.671	-25.690	.000*	.835	1.198

Note. * $p < .001$; *B* = unstandardized regression coefficient; *SE_b* = Standard error of the coefficient; β = standardized coefficient.

Exploratory Questions Results

There were two exploratory questions designed to analyze the variables more closely. The first exploratory question looked at the study variables (e.g., SA, PF, depression, and QoL) and the two different collection methods (e.g., F2F and online). The second question examined the study variables (e.g., SA, PF, depression, and QoL) and the 11 different demographic characteristics asked in the study. To begin exploration, the researcher studied instrument mean scores for the data collection method and for each of the demographic characteristics using descriptive statistics. There were large mean differences in four areas: (a) F2F and online recruitment, (b) purpose, (c) subjective health, and (d) hobbies. To determine if the differences in mean scores indicated any statistical significance, the researcher utilized One-way Analysis of Variances (ANOVA).

Although using an independent samples t test is generally used to determine differences between the means of an independent variable with only two groups (e.g., recruitment type: F2F or online), a one-way ANOVA can also be used (Laerd Statistics, 2017). In fact, when there are only two groups, the F and t test statistics adhere to the rule of $F = t^2$; meaning, when there are only two groups, the one-way ANOVA and the t test result in the same conclusion (Lomax & Hahs-Vaughn, 2012). All assumptions were met with the exception normality and homogeneity of variance. Boxplots revealed outliers that caused the normality violation. Therefore, to determine if the outliers should be retained or removed, ANOVAs were run with and without the outliers. Data demonstrated similar conclusions (e.g., both resulted in statistically significant results); as such, the outliers were retained (Laerd Statistics, 2017). With data sets larger than 30, the violation of normality should not cause an issue (Pallant, 2013). The violation of homogeneity resulted in utilizing the Welch test. When there is heterogeneity, the Welch test, an alternative to the F test, is considered more powerful (Lomax & Hahs-Vaughn, 2012). As opposed to the F statistic used in ANOVA, the Welch statistic performs best when the data is heterogeneous and has unequal group size, although the Welch Robust statistic has type I error inflation problems (Liu, 2015). Therefore, due to heterogeneity and non-normality, the Welch Robust test was used to examine group differences.

Exploratory Research Question One

The first exploratory question asked if there was a difference between aging adults' (a) subjective age (as measured by the *CAS* [Barak, 1979; Barak & Schiffman, 1981] and a single item question, (b) playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et

al., 2014a)], depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]), and quality of life (as measure by *SWLS* [Diener et al., 1985]) based on the data collection method (online or F2F).

Results from the first exploratory question revealed that although both F2F and online participants demonstrated statistical significant relationships with all four study variables (e.g., SA, PF, depression, and QoL), F2F participants scored higher in all assessments except depression, where they scored lower. The results are described below.

Subjective Age

Individuals surveyed F2F ($n = 365$, $M = -.1803$, $SD = .11511$, $p = .000$) reported feeling 18% younger than their actual age, compared to those surveyed online ($n = 901$, $M = -.0235$, $SD = .12559$, $p = .000$) who reported feeling 2% younger. In addition, there was a significant effect of subjective age for F2F participants, Welch's $F(1, 730.929) = 456.762$, $p = .000$; partial $\eta^2 = .251$, indicating large effects.

Playfulness

Individuals surveyed F2F ($n = 369$, $M = 97.59$, $SD = 16.835$, $p = .000$) scored significantly higher on the PF instrument than those surveyed online ($n = 902$, $M = 92.85$, $SD = 16.328$, $p = .000$). In addition, there was a significant effect of playfulness for F2F participants, Welch's $F(1, 665.489) = 21.069$, $p = .000$; partial $\eta^2 = .017$, indicating small effects.

Depression

Individuals surveyed F2F ($n = 369$, $M = 1.51$, $SD = 2.076$, $p = .000$) scored significantly lower on the depression instrument than those surveyed online ($n = 902$, $M = 3.07$, $SD = 3.334$, $p = .000$). In addition, there was a significant effect of depression for F2F participants, Welch's $F(1, 1068.250) = 101.731$, $p = .000$; partial $\eta^2 = .052$, indicating small effects.

Quality of Life

Individuals surveyed F2F ($n = 369$, $M = 27.06$, $SD = 5.974$, $p = .000$) scored significantly higher on the QoL instrument than those surveyed online ($n = 902$, $M = 23.45$, $SD = 7.558$, $p = .000$). In addition, there was a significant effect of quality of life for F2F participants, Welch's $F(1, 857.479) = 81.468$, $p = .000$; partial $\eta^2 = .050$, indicating small effects.

Exploratory Research Question Two

The second exploratory question asked if there was a difference between aging adults' (a) subjective age (as measured by the *CAS* [Barak, 1979; Barak & Schiffman, 1981] and a single item question, (b) playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), (c) depression (as measured by the *GDS* [Brink et al., 1982]), quality of life (as measured by *SWLS* [Diener et al., 1985]) and their reported demographic variables (e.g., gender, age, race, relationship status, education, etc.)

Purpose

Subjective Age

Individuals who reported their life had purpose ($n = 1,192$, $M = -.0750$, $SD = .13814$, $p = .000$) reported feeling 7% younger than their actual age, compared to those who stated they did not have purpose ($n = 74$, $M = .0326$, $SD = .16003$, $p = .000$) who reported feeling 3% *older* than their actual age. In addition, there was a significant effect of subjective age on purpose, Welch's $F(1, 79.899) = 31.962$, $p = .000$; partial $\eta^2 = .032$, indicating small effects.

Playfulness

Individuals who reported that they felt their life had purpose ($n = 1196$, $M = 94.97$, $SD = 16.126$, $p = .000$) scored significantly higher on the PF instrument than individuals who reported that their lives did not have purpose ($n = 75$, $M = 82.28$, $SD = 19.540$, $p = .000$). In addition, there was a significant effect of playfulness on purpose, Welch's $F(1, 80.477) = 30.361$, $p = .000$; partial $\eta^2 = .032$, indicating small effects.

Depression

Individuals who reported their life had purpose ($n = 1196$, $M = 2.26$, $SD = 2.664$, $p = .000$) scored in the “normal” range on the depression instrument, compared to those in the “mild” depression range who reported their life did not have purpose ($n = 75$, $M = 8.41$, $SD = 3.817$, $p = .000$). In addition, there was a significant effect of depression on purpose, Welch's $F(1, 78.586) = 189.432$, $p = .000$; $\eta^2 = .219$, indicating large effects.

Quality of Life

Individuals who reported their life had purpose ($n = 1,196$, $M = 25.13$, $SD = 6.797$, $p = .000$) scored in the “high” life satisfaction range, compared to those in the “slightly below average” range who reported no purpose ($n = 75$, $M = 14.39$, $SD = 7.934$, $p = .000$). In addition, there was a significant effect of quality of life on purpose, Welch’s $F(1, 80.959) = 131.569$, $p = .000$; partial $\eta^2 = .120$, indicating medium effects.

Subjective Health

Subjective Age

Individuals who reported “excellent” health ($n = 131$, $M = -.1363$, $SD = .13136$, $p = .000$) felt 13% younger than their actual age compared to those who reported their health a “very good” (10% younger; $n = 440$, $M = -.1003$, $SD = .13124$, $p = .000$), “good” (6% younger; $n = 469$, $M = -.0607$, $SD = .13625$, $p = .000$), “fair” (1% older; $n = 207$, $M = .0115$, $SD = .13571$, $p = .000$), and “poor” (5% older; $n = 19$, $M = .0582$, $SD = .15113$, $p = .000$). In addition, there was a significant effect of subjective age on subjective health, Welch’s $F(4, 121.931) = 36.232$, $p = .000$; partial $\eta^2 = .106$, indicating small effects.

Playfulness

Individuals who reported experiencing “fair” health ($n = 208$, $M = 90.69$, $SD = 17.442$, $p = .000$) scored significantly lower on the PF instrument than those who reported their health as “very good” ($n = 440$, $M = 95.80$, $SD = 15.544$, $p = .000$) and “excellent” ($n = 131$, $M = 97.14$, $SD = 17.068$, $p = .000$). As such, there was a significant effect of playfulness on subjective

health, Welch's $F(4, 121.799) = 5.317, p = .000$; partial $\eta^2 = .018$, indicating small effects. All other differences did not meet criteria for statistical significance.

Depression

Individuals who reported "poor health" ($n = 19, M = 7.58, SD = 4.100, p = .000$) reported significantly higher scores on the depression instrument than those who reported their health as "fair" ($n = 208, M = 5.26, SD = 3.674, p = .000$), "good" ($n = 472, M = 2.79, SD = 3.000, p = .000$), "very good" ($n = 440, M = 1.51, SD = 1.961, p = .000$), and "excellent" ($n = 131, M = .84, SD = 1.558, p = .000$). As such, there was a significant effect depression on subjective health, Welch's $F(4, 121.684) = 81.228, p = .000$; partial $\eta^2 = .236$, indicating large effects.

Quality of Life

Individuals who reported "excellent" health ($n = 131, M = 28.73, SD = 5.734, p = .000$) scored significantly higher on the QoL instrument than those who reported their health as "very good" ($n = 440, M = 26.51, SD = 6.006, p = .000$), "good" ($n = 472, M = 24.22, SD = 6.899, p = .000$), "fair" ($n = 208, M = 19.22, SD = 7.632, p = .000$), and "poor" ($n = 19, M = 13.05, SD = 6.940, p = .000$). In addition, there was a significant effect of quality of life on subjective health, Welch's $F(4, 122.315) = 65.214, p = .000$; partial $\eta^2 = .183$, indicating large effects.

Hobbies

Subjective Age

Individuals who reported engaging in 1-2 hobbies/week ($n = 689, M = -.0471, SD = .14263, p = .000$) reported feeling 4% younger than their actual age, compared to those who

reported engaging in 3-4 hobbies (7% younger; $n = 426$, $M = -.0790$, $SD = .13742$, $p = .000$) and 5+ hobbies (13% younger; $n = 146$, $M = -.1387$, $SD = .12460$, $p = .000$). As such, there was a significant effect of subjective age on hobbies, Welch's $F(2, 414.962) = 31.869$, $p = .000$; partial $\eta^2 = .043$, indicating small effects.

Playfulness

Individuals who reported engaging in 1-2 hobbies/week ($n = 693$, $M = 90.98$, $SD = 16.764$, $p = .000$) scored significantly lower on the PF instrument than those who reported engaging in 3-4 hobbies ($n = 427$, $M = 97.10$, $SD = 15.567$, $p = .000$) and 5+ hobbies/week ($n = 146$, $M = 100.77$, $SD = 15.228$, $p = .000$). As such, there was a significant effect of playfulness on hobbies, Welch's $F(2, 408.479) = 33.555$, $p = .000$; partial $\eta^2 = .049$, indicating small effects.

Depression

Individuals who reported engaging in 1-2 hobbies/week ($n = 693$, $M = 3.31$, $SD = 3.395$, $p = .000$) scored significantly higher on the depression instrument than those who reported engaging in 3-4 hobbies ($n = 427$, $M = 1.98$, $SD = 2.600$, $p = .000$) and 5+ hobbies ($n = 146$, $M = 1.11$, $SD = 1.850$, $p = .000$). In addition, there was a significant effect of depression on hobbies, Welch's $F(2, 503.636) = 63.773$, $p = .000$; partial $\eta^2 = .069$, indicating medium effects.

Quality of Life

Individuals who reported engaging in 1-2 hobbies/week ($n = 693$, $M = 23.08$, $SD = 7.575$, $p = .000$) scored significantly lower on the QoL instrument than those who reported engaging in 3-4 hobbies ($n = 427$, $M = 25.56$, $SD = 6.866$, $p = .000$), and 5+ hobbies ($n = 146$, $M = 28.08$, SD

= 5.497, $p = .000$). In addition, there was a significant effect of quality of life on hobbies, Welch's $F(2, 446.122) = 46.284, p = .000$; partial $\eta^2 = .055$, indicating small effects.

In sum, the results of this investigation revealed significant effects among F2F and online participants and three demographic characteristics (e.g., purpose, subjective health, hobbies). In short, individuals who were surveyed F2F, or stated their lives had purpose, or reported “excellent” health, or engaged in 5+ hobbies/week reported feeling younger, being more playful, having less depression, and indicated overall higher quality of life.

Chapter Summary

In chapter four, the researcher presented the results regarding (a) sampling and data collection procedures, (b) initial descriptive statistics and data results, (c) data screening and statistical assumptions for multiple regression, and (d) data analysis of the research question and exploratory questions. The researcher examined the primary and exploratory research questions using: (a) descriptive statistics, (b) Multiple Regression, (c) Hierarchical Regression, and (d) Pearson Product-Moment Correlations. In chapter five, the researcher presents a discussion of the results and offers implications for future research.

CHAPTER FIVE: DISCUSSION

Chapter five provides an overview of the study, the research methods, and discussion of significance and implications of the results from the investigation. Specifically, chapter five presents the results of the primary research question, the exploratory questions, and comparison of results to previous investigations. In addition, the chapter reviews the limitations of this study, as well as implications and recommendations for future research.

Study Summary

The U.S. Census Bureau reported that the largest increase in population among individuals age 65 and older is projected to occur between 2020-2030. During this 10-year span, the youngest baby boomers will have turned 65; resulting in an estimated increase of 18 million adults, totaling approximately 74 million adults over the age of 65 living in the U.S. (Colby & Ortman, 2014). In addition, relationships exist between increases in age and changes in health, relationships, support systems, and social identity. As such, research focused on understanding and exploring the factors that both enhance and impede QoL among aging adults is warranted (Colby & Ortman, 2014). The National Institute of Aging (NIA) has prioritized research focused on improving QoL through prevention and healthy lifestyle promotion programs due to rising healthcare costs (Colby, Ortman, 2014; Conrad et al., 2014; King et al., 2013). While QoL has been defined in several different ways, (e.g., wellbeing, satisfaction with life) for the purposes of this investigation, QoL has been defined as overall life satisfaction. Feeling satisfied with life can serve as a protective factor against declines in physical health and loss of significant roles related to aging (Friedman et al., 2017). Two constructs related to QoL, subjective age (SA) and

playfulness (PF), were further investigated in this study. Individually, both of these variables have empirical support in positively influencing QoL (see Proyer, 2013; Westerhof & Barrett, 2005; Stephen et al., 2011); however, SA and PF have yet to be studied together, primarily in the field of counselor education.

Subjective age refers to how old or young individuals feel. Playfulness has been defined in this study as, “the ability to frame or reframe everyday situations to experience them as entertaining, intellectually stimulating, and/or personally interesting” (Proyer, 2015, p. 93-94). In other words, PF is a mindset that provides individuals with the ability to use play outside of the context of play (Sicart, 2014). Depression, a factor that impedes QoL, is an emotional state of enduring sadness ranging from mild discouragement and gloominess to feelings of extreme despair, often accompanied by irritability, restlessness, or difficulty remembering (Center for Disease Control and Prevention, 2017; Corsini, 2002). The theoretical framework was grounded in Fredrickson’s Broaden-and-Build Theory of Positive Emotions (Fredrickson, 1998, 2001), which proposes that positive emotions can increase individuals’ coping resources to effectively handle negative emotions and/or situations (Fredrickson, 1998, 2001; Vacharkulksemsuk & Fredrickson, 2013). Therefore, the goal of this study was to explore the relationships between the variables of SA, PF, depression, and QoL for adults 55 and older. The following section summarizes the research methods and procedures that were used.

Method

The primary aim of the study was to determine the extent to which SA, PF, and depression predict QoL for adults over the age of 55. Standard multiple regression and

hierarchical regression were utilized to answer the primary research question, and one-way ANOVAs were utilized to answer the two exploratory questions.

The investigation was approved by the University's IRB. Data collection began on December 6, 2017 and concluded on January 19, 2018. Participants ($N = 1,315$) were a sample of adults who were 55 and older and spoke English. The sample was comprised of predominantly Caucasian individuals ($n = 1,051$, 80%) with the remaining participants ($n = 262$, 20%) comprised of minority racial identities (e.g., American Indian/Alaskan Native, Asian, Bi/Multi-racial, Black/African-American, Hawaiian or Pacific Islander, and Other). In addition, the majority of individuals were between the ages of 55-65 ($n = 754$, 57.4%). Also, more than half of the participants ($n = 801$, 60.9%) stated that they were married or in a committed relationship.

Data was collected both face-to-face (F2F) and online (e.g., MTurk and senior educational program). The researcher recruited F2F participants from the following sites: (a) churches, (b) senior centers, (c) retirement and apartment communities, (d) libraries, and (e) social clubs. In total, the researcher obtained 412 surveys from F2F recruitment which yielded 377 usable responses (91.5%). In addition to F2F participants, the researcher collected survey responses online through Amazon Mechanical Turk (MTurk) and the senior educational program. Participants on MTurk were able to earn \$.50 for answering the 10-minute survey. The researcher obtained 884 surveys through MTurk, which yielded 808 usable responses (91.4%). The senior educational program members, a community of individuals 55 and older who participate in personal enrichment courses on the campus of a large university in Central Florida, were invited to answer the survey online. The researcher obtained 142 surveys from participants which yielded 130 useable responses (91.5%).

All participants answered questions from four assessments and one demographic questionnaire. The survey totaled 56 questions and included: (a) 11 demographic questions, (b) subjective age measures [a single item question] and the CAS (Barak, 1979; Barak & Schiffman, 1981), (c) the APTS (Shen et al., 2014a), (d) the GDS (Brink et al., 1982), and (e) SWLS (Diener et al., 1985).

Primary Research Question

The current study sought to examine: To what extent does subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981]), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predict quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among aging adults (55+)?

Secondary Research Question 1.A

In addition, after controlling for the possible effect of depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]), does subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981]), and playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), still predict a significant amount of the variance in overall QoL (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among adults 55 and older?

Secondary Research Question 1.B

As a follow-up to the primary research question, the researcher determined to what extent subjective age (as measured by the *Cognitive Age Scale* [CAS; Barak, 1979; Barak & Schiffman, 1981] and a single item question), playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), and depression (as measured by the *Geriatric Depression Scale: Short Form* [GDS; Brink et al., 1982]) predicted quality of life (as measured by the *Satisfaction with Life Scale* [SWLS; Diener et al., 1985]) among aging adults (55+) for each separate group of recruited participants (e.g., F2F and online).

Exploratory Research Questions

1. Is there a difference between aging adults' (a) subjective age (as measured by the CAS [Barak, 1979; Barak & Schiffman, 1981] and a single item question), (b) playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), (c) depression (as measured by the *GDS* [Brink et al., 1982]), and quality of life (as measured by *SWLS* [Diener et al., 1985]) based on the data collection method (e.g., F2F versus online recruitment)?
2. Is there a difference between aging adults' (a) subjective age (as measured by the CAS [Barak, 1979; Barak & Schiffman, 1981] and a single item question), (b) playfulness (as measured by the *Adult Playfulness Trait Scale* [APTS; Shen et al., 2014a]), (c) depression (as measured by the *GDS* [Brink et al., 1982]), and quality of life (as measure by *SWLS* [Diener et al., 1985]) and their reported demographic variables (e.g., gender, age, race, relationship status, education)?

Descriptive Data Analysis

Aging adults 55 and older were the target population of this study. Face-to-Face participants were recruited from the Central Florida area as well as from New Jersey, California, and Alabama. While there were 11 demographic variables in the current study, the main demographic data (e.g., gender, race, relationship status, and average age) of the participants were consistent with previous research utilizing aging adults.

The majority of participants in the current study were female ($n = 866$; 65.9%), married or in a committed relationship ($n = 801$; 60.9%), Caucasian ($n = 1,051$; 80%), and the average age of participants was 65.6 years. In a 2012 study, reported demographic variables revealed that the majority of the participants were female ($n = 911$; 56.8%), the average age was 73.6 years, the majority of participants identified as Caucasian (84.6%) and more than half of the participants married (57.8%; Baernholdt et al., 2012). Similarly, Grembowski and colleagues (1993) conducted a study on self-efficacy and health behavior, demographics were similar as the majority of participants were female (61%), married (64%), Caucasian (96%), and between the ages of 65-74 (67%; Grembowski et al., 1993). In a more recent 2015 study, demographic information revealed that the majority of participants were women (85%) and had an average age of 75.10 years (Ponce de Leon et al., 2015). In sum, reported demographic characteristics in the current study are within a similar range as previous studies.

Table 23

Current Study Demographics Compared to Previous Studies

Current Study	Previous Studies			
Female	866 (65.9%)	56.8% ^a	61% ^b	85% ^c
Married	801 (60.9%)	57.8%	64%	--
Caucasian	1,051 (80%)	84.6%	96%	--
Average Age	65.6 years	73.6 years	65-74 years	75.10 years

Note. ^aBaernholdt et al., 2012; ^bGrembowski et al., 1993; ^cPonce de Leon et al., 2015

Discussion of the Findings

Preliminary Analyses

The researcher utilized Pearson correlations to investigate the relationship between SA (using both measures) and QoL. Utilizing the single item question, (e.g., “*Many people feel older or younger than they actually are. What age do you feel most of the time*”), there was a small negative correlation between SA and QoL, $r = -.22$, $n = 1,201$, $p = .000$. In a similar study, Westerhof & Barrett (2005) also examined SA and life satisfaction among aging adults ($N = 2,006$) using the single item question. The researchers, used discrepancy scores (subjective age minus actual age), and not proportional discrepancy scores [(subjective age minus actual age)/actual age] to determine the results. Westerhof and Barrett (2005) revealed a small positive correlation between a younger SA (a positive number in their study) and higher life satisfaction, $r = .20$, $p < .05$ (Westerhof & Barrett, 2005). Pearson correlation results between the second measure for SA (e.g., CAS) and QoL revealed a medium, negative correlation between SA and QoL, $r = -.31$, $n = 1,201$, $p < .001$. In other words, the younger individuals feel, the higher their QoL. In a previous study, Stephan and colleagues (2011) also utilized the CAS measure when examining life satisfaction among aging adults ($N = 250$). Results indicated a small positive

relationship between a younger SA (a positive number in their study) and higher life satisfaction, $r = 0.17, p < 0.01$.

Relationships between PF and QoL (as measured by SWLS) indicated medium, positive correlations, $r = .301, n = 1,271, p = .000$. Simply put, higher levels of PF were associated with higher levels of QoL. The findings from the current study coincide with findings from previous studies. Proyer (2013) investigated the relationship between PF and QoL with adults ($N = 255$) between the ages of 18-67, results identified a small correlation between PF and QoL, $r = .20, p < .01$. In another study, Proyer and colleagues (2010) investigated sense of humor and its correlates in aging adults ($N = 979$). Pearson correlation results demonstrated a medium positive relationship between PF and well-being, $r = 0.30, p < 0.01$ (Proyer et al., 2010).

The relationship between depression and QoL was examined using Pearson correlation. Results indicated that there was a large, negative correlation between depression and QoL, $r = -.681, n = 1,271, p = .000$. The results demonstrated that lower levels of depression were associated with higher levels of overall QoL. In a previous study, Enkvist and colleagues (2012) examined factors that influenced life satisfaction among aging adults ($N = 593$). Using Spearman's correlation coefficient, results indicated that depression negatively correlated with life satisfaction, $r = -0.274, p < .001$.

Moreover, Pearson correlations for SA revealed a negative correlation with PF. The single item question revealed that there was a small, negative correlation between SA and PF, $r = -.27, n = 1,201, p = .000$. In other words, a younger SA was associated with higher levels of PF. Using the second measure of SA, the CAS, there was a medium, negative correlation between SA and PF, $r = -.33, n = 1,201, p = .000$. The results demonstrated again that a younger SA was

associated with higher levels of playfulness. The results of the correlation could not be verified with other studies as variables of SA and PF have not been studied together in prior research.

Table 24

Correlation Matrix

		CAS Total Scores	PDS Total Scores	PF Total Scores	GDS Total Scores	QoL Total Scores
CAS Total Scores	Pearson Correlation Sig. (2-tailed)	1	.596** .000	-.331** .000	.417** .000	-.319** .000
1-item Total Scores	Pearson Correlation Sig. (2-tailed)	.596** .000	1	-.274** .000	.350** .000	-.222** .000
PF Total Scores	Pearson Correlation Sig. (2-tailed)	-.331** .000	-.274** .000	1	-.302** .000	.289** .000
GDS Total Scores	Pearson Correlation Sig. (2-tailed)	.417** .000	.350** .000	-.302** .000	1	-.690** .000
QoL Total Scores	Pearson Correlation Sig. (2-tailed)	-.319** .000	-.222** .000	.289** .000	-.690** .000	1

Note. **Correlation is significant at the 0.01 level (2-tailed).

Primary Research Question Results

Results from the primary research question indicated SA, PF, and depression statistically significantly predicted QoL $F(3, 1262) = 376.273, p = .000$; adj. $R^2 = .471$, with a large effect size $f^2 = .89$. The regression equation is expressed in the following form:

$$QoL = 24.207 - .886 (CAS) + .045 (PF) - 1.513 (GDS).$$

The slope coefficient (B) represents the change in the dependent variable (e.g., QoL) for a one-unit change in the independent variables (e.g., SA, PF, and depression). As such, when all other independent variables are held constant, an increase in age by one year is associated with a

decrease in QoL by -.886. In addition, as PF increases by one-unit, QoL increases by .045, and as depression increases by one-unit, QoL decreases by -1.513. Therefore, the multiple regression equation predicts that the older and more depressed individuals feel, the lower their QoL, while the younger and more playful individuals feel, the higher the QoL. In addition, the 95% confidence intervals (CI) for: (a) SA were between -3.217 and 1.446; (b) PF were between .026 and .064; and (c) depression were between -1.618 and -1.407. In other words, although only two of the three variables were significant (e.g., PF and depression), there is 95% confidence that the true value of the slope coefficient is between those lower and upper bounds.

Therefore, the results of the regression analyses explain that R^2 for the overall model was 47.2% with an adjusted R^2 of 47.1%, with a large effect size $f^2 = 0.89$ according to Cohen (1988). Of the three variables, depression made the largest unique contribution ($beta = -.642, p = .000$), and PF made a small statistically significant contribution ($beta = .102, p = .000$). Subjective age did not statistically significantly contribute to the prediction ($beta = -.017, p = .456$).

Table 25

Summary of Multiple Regression Analysis

Variable	<i>B</i>	<i>SE_b</i>	β	t	Sig.	Tolerance	VIF
(Constant)	24.207	.950	--	25.479	.000	--	--
CAS Total Score	-.886	1.188	-.017	-.745	.456	.785	1.274
PF Total Score	.045	.010	.102	4.613	.000*	.861	1.161
GDS Total Score	-1.513	.054	-.642	-28.104	.000*	.801	1.248

Note. * $p < .001$; *B* = unstandardized regression coefficient; *SE_b* = Standard error of the coefficient; β = standardized coefficient.

In addition, the possible effect of depression was controlled to determine the amount of variance the remaining variables (SA and PF) contributed to QoL. Hierarchical multiple regression was utilized to determine if the addition of PF and SA improved the prediction of QoL over and above depression alone. The full model of SA, PF, depression, and QoL was statistically significant, $R^2 = .472$; $F(3, 1262) = 376.273$, $p = .000$; with a large effect size, $f^2 = 0.89$. Results indicated that depression explained 46.2% of the variance in QoL, while the addition of SA and PF contributed a minimal amount of variance, 1% in QoL [$R^2 = .010$, $F(2, 1262) = 12.412$, $p = .000$, $f^2 = 0.01$]. In the final model, only one of the control variables, PF, was statistically significant, ($beta = .102$, $p = .000$).

Regression results in the current investigation were similar to previous research studying variables that influence QoL, where depression emerged as the most influential predictor. For example, in a previous study, Ní Mhaoláin and colleagues (2012) investigated which factors predicted well-being among adults ($N = 466$) over the age of 65 in Ireland. Results from a stepwise hierarchical linear regression indicated depression ($\beta = -2.23$, $p = .000$, $R^2 = 0.414$), had greater influence on QoL than loneliness ($\beta = -0.782$, $p < 0.001$, $R^2 = 0.414$), neuroticism ($\beta = -0.182$, $p < 0.001$, $R^2 = 0.414$), and subjective exhaustion ($\beta = -0.919$, $p < 0.045$, $R^2 = 0.414$; Ní Mhaoláin et al., 2012). In another study, Raggi and colleagues (2016) conducted an observational, cross-sectional study among individuals ($N = 5,639$) across three European countries. Eight hierarchical regression models with the following variables inputted in order were created: (a) sociodemographic variables, (b) health habits, (c) chronic conditions (i.e. depression), (d) health state descriptors, (e) vision and hearing, (f) social network index, and (f) the environment. Results indicated that depression was assessed through chronic conditions and

health state descriptors. As a result, while several variables had a significantly negative relationship with QoL, depression was measured in the four variables above, resulting in a combined effect of depression that was larger than other variables [e.g., depression ($B = -3.18, p \leq .001$), mild sadness ($B = -2.81, p \leq .001$), moderate sadness ($B = -3.53, p \leq .001$), and severe sadness ($B = -3.53, p \leq .001$)].

Additional studies revealed that although depression was not the most influential predictor, it still emerged as an important variable. Envkist and colleagues (2012) studied factors that predicted QoL among participants ($N = 682$) between the ages of 78-98. Results from logistic regression analysis indicated five factors predicted life satisfaction after three years: (a) number of health symptoms ($B = -0.075, p = 0.001$); (b) locus of internal control ($B = 0.090, p = 0.006$); (c) depressive mood ($B = -0.086, p = 0.014$); (d) marital status vs being single ($B = -0.538, p = 0.031$); and (e) higher age ($B = -0.052, p = 0.010$).

In summary, the results of the current research study, which demonstrated that depression was the most influential variable in the model, align with previous research. Prior researchers have shown that the construct of depression is an important factor in overall QoL. As such, future research must take into consideration the role of depression in the lives of older adults.

The results for the F2F and online participants differ than the overall results presented above. Results revealed that participants surveyed F2F indicated less overall depression ($M = 1.24, SD = 1.440$), more playfulness ($M = 98.30, SD = 16.263$), and younger subjective ages ($M = -.1846, SD = .11141$) than individuals surveyed online [depression ($M = 3.06, SD = 3.322$), playfulness ($M = 92.88, SD = 16.316$), subjective age ($M = -.0235, SD = .12559$)]. Moreover, for the F2F participants, while depression remained the largest unique contributor to the equation (β

= -.378, $p = .000$), PF accounted for more of the variance ($\beta = .216, p = .000$) and SA statistically contributed to the model ($\beta = .117, p = .021$). Further, results indicated that for individuals surveyed F2F, while they reported feeling younger than individuals surveyed online, feeling older did not lower overall QoL. For the online participants however, there was a larger span between the variables. For instance, depression ($\beta = -.671, p = .000$) made the largest contribution, while PF made a much smaller contribution ($\beta = .068, p = .009$). Subjective age was an insignificant variable ($\beta = -.012, p = .642$), and as such did not contribute to the model.

The differences found between the F2F and online participants coincides with previous research which indicates individuals who are socially connected to others increase their overall QoL. Newsom and Schulz (1996), examined social support as a mediator between functional status and QoL among older adults. Using structural equation modeling, Newsom and Shulz's results demonstrated that for individuals ($N = 4,734$) over the age of 65, feelings of belonging and tangible support were significant predictors of overall life satisfaction ($\beta = .150, p < .001$ and $\beta = .289, p < .001$). The results of the study also indicated that the direct paths between physical impairment and depressive symptoms ($\beta = .389, p < .001$) and between physical impairment and QoL variables ($\beta = -.218, p < .001$) were significant.

In the current study, the differences between the F2F and online participants may be related to several factors, one of which may have been that the collection of F2F participants occurred in highly social settings, where similar to the results of Newsom and Schulz (1996), feelings of belonging increased feelings of overall QoL.

Exploratory Questions Results

There were two exploratory questions designed to analyze the variables more closely. The first exploratory question explored the difference between the study variables (e.g., SA, PF, depression, and QoL) and the two data collection methods (e.g., F2F and online). The second question explored the difference between the variables (e.g., SA, PF, depression, and QoL) and the 11-different participant demographic characteristics. To begin exploration, the researcher studied instrument mean scores for the data collection method and for each of the demographic characteristics using descriptive statistics. There were large mean differences in four areas: (a) F2F and online recruitment, (b) purpose, (c) subjective health, and (d) hobbies. To determine if the differences in mean scores indicated any statistical significance, One-way Analysis of Variances (ANOVA) was utilized.

Exploratory Research Question One

Results from the first exploratory question revealed that participants who engaged in F2F data collection methods indicated statistically significant relationships with four study variables (e.g., SA, PF, depression, and QoL). Specifically, there was a significant effect for F2F participants ($n = 369$) on: (a) SA, Welch's $F(1, 730.929) = 456.762, p = .000$; partial $\eta^2 = .251$, indicating large effects; (b) playfulness, Welch's $F(1, 665.489) = 21.069, p = .000$; partial $\eta^2 = .017$, indicating small effects; (c) depression, Welch's $F(1, 1068.250) = 101.731, p = .000$; partial $\eta^2 = .052$, indicating small effects; and (d) QoL, Welch's $F(1, 857.479) = 81.468, p = .000$; partial $\eta^2 = .050$, indicating small effects. In other words, individuals who were surveyed

F2F compared to those who were surveyed online, felt younger, were more playful, had less depression, and had higher QoL.

Face-to-face recruitment was conducted in highly social settings (e.g., churches, community centers, social clubs); therefore, differences found between F2F and online participants may be due to increased social connection. Previous research has confirmed the positive impact of social connection for older adults. Rowe and Kahn (1998) in the McArthur Foundation Study, revealed that social engagement was reported to be one of the three major elements that contributed to successful aging. Furthermore, they defined social engagement as remaining involved in activities that were meaningful and purposeful as well as maintaining close relationships. In addition, Adams and colleagues (2016) investigated the association of different psychosocial and health-related factors to satisfaction with life. Participants ($N = 237$) over the age of 70 were evaluated on two occasions two weeks apart. Linear regression results indicated that fewer depressive symptoms ($B = -5.24, SE = 1.62, p < 0.001$) and lower perceived stress ($B = -.16, SE = 0.06, p < 0.01$) were significantly associated with higher life satisfaction, after controlling for demographics, mood variables, and social support. In addition, there was a significant interaction between social support and depression ($B = .19, SE = .07, p < .05$), indicating that social support buffered the negative impact of depressive symptoms on life satisfaction

Exploratory Research Question Two

Results from the one-way ANOVA for the second exploratory question revealed that three demographic characteristics (e.g., purpose, subjective health, hobbies) demonstrated statistical significant relationships with SA, PF, depression, and QoL.

Purpose

There was a significant effect of purpose on: (a) subjective age, Welch's $F(1, 79.899) = 31.962, p = .000$; partial $\eta^2 = .032$, indicating small effects; (b) playfulness, Welch's $F(1, 80.477) = 30.361, p = .000$; partial $\eta^2 = .032$, indicating small effects; (c) depression, Welch's $F(1, 78.586) = 189.432, p = .000$; $\eta^2 = .219$, indicating large effects; and (d) quality of life, Welch's $F(1, 80.959) = 131.569, p = .000$; partial $\eta^2 = .120$, indicating medium effects. Results demonstrated that individuals who stated their life had purpose felt younger, were more playful, had less depression, and had higher QoL.

The results for the variable of purpose is supported by previous research on purpose and aging adults. Kim and colleagues (2013) examined purpose in life and the risk of heart attacks. Participants ($N = 6,739$) over the age of 50 were studied for four years. Participants were stroke-free at baseline. During the four-year study, 265 participants experienced a stroke. Results indicated that each standard deviation increase in purpose was associated with a multivariate-adjusted odds ratio of 0.78 for stroke (95% CI, 0.67-0.91, $p = .002$). In other words, individuals with higher purpose were at a lower risk for stroke. After adjusting for covariates (e.g., age, gender, positive and negative psychological factors and health factors), purpose in life was associated with a 22% reduced risk of stroke over a four-year follow-up period. After studying

1,500 individuals with cardiovascular disease for two years, researchers found that each unit increase in purpose in life (on a six-point scale), was associated with a 27% decreased risk of having a heart attack (Kim, Sun, Park, Kubzanskly, & Peterson, 2013).

Furthermore, Boyle and colleagues (2010) tested the hypothesis that greater life purpose reduced the risk for Alzheimer's disease. The researchers studied individuals ($N = 900$) for seven years and data demonstrated that greater purpose in life was associated with a substantially reduced risk of Alzheimer disease (hazard ratio, 0.48; 96% Confidence Interval, 0.33-0.69, $p < .001$). In other words, a person with a high score on an instrument for purpose in life (score = 4.2, 90th percentile) was approximately 2.4 times more likely to remain Alzheimer's free than a person with a low score (score = 3.0, 10th percentile).

Subjective Health

There was a significant effect of individuals who reported "excellent" health ($n = 131$) on: (a) subjective age, Welch's $F(4, 121.931) = 36.232$, $p = .000$; partial $\eta^2 = .106$, indicating medium effects; (b) playfulness, Welch's $F(4, 121.799) = 5.317$, $p = .000$; partial $\eta^2 = .018$, indicating small effects; (c) depression, Welch's $F(4, 121.684) = 81.228$, $p = .000$; partial $\eta^2 = .236$, indicating large effects; and (d) quality of life, Welch's $F(4, 122.315) = 65.214$, $p = .000$; partial $\eta^2 = .183$, indicating large effects. In other words, individuals who believed their health to be "excellent" felt younger, were more playful, had less depression, and had higher QoL than individuals who reported their health as being "very good," or "good."

The results for subjective health have been supported by previous studies. Berg and colleagues (2006) examined factors associated with life satisfaction among the oldest-old adults.

Participants ($N = 315$) were between the ages of 80-98. Stepwise regression analyses revealed that for women, self-rated health ($B = 4.134$, $\beta = .349$, R^2 change = .117, $p < .001$) was one of the variables that was significantly associated with life satisfaction.

Hobbies

There was a significant effect of individuals who reported engaging in 5+ hobbies/week ($n = 146$) on: (a) subjective age, Welch's $F(2, 414.962) = 31.869$, $p = .000$; partial $\eta^2 = .043$, indicating small effects; (b) playfulness, Welch's $F(2, 408.479) = 33.555$, $p = .000$; partial $\eta^2 = .049$, indicating small effects; (c) depression, Welch's $F(2, 503.636) = 63.773$, $p = .000$; partial $\eta^2 = .069$, indicating medium effects; and (d) Quality of life, Welch's $F(2, 446.122) = 46.284$, $p = .000$; partial $\eta^2 = .055$, indicating small effects. In other words, individuals who reported engaging in 5+ hobbies/week felt younger, were more playful, had less depression, and had higher QoL than individuals who reported engaging in 1-2 hobbies/week or 3-4 hobbies/week.

The benefit of hobbies, particularly in how they increase social integration among aging adults has been supported by previous research. Toepoel (2013) investigated aging, leisure, and social connectedness among adults ($N = 5,910$) age 18 and older. Using standard multiple regression, hobbies among the age groups of 55-64 ($B = .087$, $p < .01$) and 65-74 ($B = .153$, $p < .01$) and 75+ ($B = .159$, $p < .01$), was a significant predictor for the number of social gatherings a person had.

In summary, the results of the exploratory questions indicate areas for further research. Future study could center around developing a deeper understanding of purpose, subjective

health, and hobbies as they relate to aging adults. In addition, developing practical methods to increase the above variables in the lives of aging adults could be beneficial.

Study Limitations

As with all research, results from the current investigation should be viewed in light of related limitations. Specifically, the results of the study were limited by: (a) research design, (b) sampling methodology, and (c) instrumentation. The researcher presents the limitations in the following section.

Research Design

The researcher attempted to anticipate and mitigate against threats to external, internal, and test validity. As such, a limitation to the research design was the utilization of self-report instruments (Gall et al., 2007). While survey-based research allows participants to answer for themselves, answers are limited to fixed responses and do not provide an opportunity for participants to elaborate. In addition, social desirability bias may be a problem with self-report instruments. An additional limitation to the study was online data gathering as there was no way to verify if a person, and not a machine, was answering the survey. Gathering data F2F and confirming that demographic characteristics between online and F2F participants were similar, provided a validity check against this limitation.

Sampling Limitations

It is important to have a large and diverse sample in order to make generalizations to the greater population (Tabachnick & Fidell, 2013). In addition, while random sampling increases

the opportunities for generalizing, convenience sampling is viewed as pragmatic and satisfactory (Gall et al., 2017). Therefore, the researcher utilized convenience sampling with inclusion criteria (e.g., speaking/reading English and 55 and older) through two methods of collecting data, online and F2F. Using both methods helped the researcher obtain a large sample size ($N = 1,315$). While participants were taking the survey online through MTurk, the researcher recruited participants from facilities that granted permission. As such, the majority of participants were recruited through (a) senior centers, (b) assisted living facilities, (c) churches, and (d) educational programs. The majority of the participants in the study were female and Caucasian, therefore, the results of this investigation may not be generalizable to *all* aging adults throughout the U.S. or other countries.

Additionally, there was the potential for the influence of environmental conditions across settings (Johnson & Christensen, 2004). Data collection was completed in December of 2017 and January of 2018, and it is unknown how the winter holidays may have affected participation. Moreover, because of the timing, many F2F participants were recruited while they were attending different holiday events. It is unclear how the setting of these holidays and/or New Year's may have influenced the participants' answers. For example, while it is commonly believed that depression increases during the holiday months (see Sansone & Sansone, 2011), the results of the current study do not indicate high depression levels among the participants. Taking the assessments during holiday social events may have resulted in a positive bias. Furthermore, it is difficult to determine if the individuals recruited online may have been a unique sample of individuals interested in the subject of QoL or answered quickly, to earn the monetary award.

Another limitation is that the population of adults who participated in this study may have been disproportionately healthier and less depressed than the average adult their age. In other words, because the results of the depression assessment were generally below the score of 10, indicating depression ranges from normal to mild, the sample population may have been skewed towards healthier and less depressed individuals. Previous research with aging adults has shown a similar bias towards a healthier population (see Awick et al., 2015; Bowling & Liffie, 2011; Low, Molzahn, & Schopflocher, 2013).

Instrumental Limitations

One of the main limitations of this study was instrumentation. While the variable of SA has been measured and researched for over 60 years, the measurement options include using either a single item question and a mathematical formula such as proportional discrepancy scores, or the CAS (Barak, 1979; Barak & Schiffman, 1981). Both measures needed further clarification and directions were provided by fellow researchers (see D. Kotter-Grühn, personal communication, September 18, 2017; A. Terracciano, personal communication, July 18, 2017). Moreover, approximately 70 individuals did not answer the single item question (e.g., *“Sometimes people feel older or younger than their age. During the last month, what age did you feel most of the time?”*) in a way that allowed the researcher to compute an answer. Many individuals answered the question with the word, “younger,” making proportional discrepancy scores impossible to calculate. Upon reflection, the researcher would have asked these questions differently to ensure ages were given with more explanation as to the importance of providing an age.

Secondly, the researcher utilized the APTS (Shen et al., 2014a). There are 12 published measures of PF which includes instruments for both children, adolescents, and adults. The APTS was selected because it provided a total score along with subscales, and the questions were not too specific or leading. However, the APTS is still relatively new and has yet to be used extensively in research. Therefore, it has not been as established as some of the other instruments in the study.

Furthermore, the APTS contained several questions that, along with the Likert selections (e.g., “strongly disagree”...“strongly agree”) produced double negative questions for participants (e.g., “*I don’t always follow the rules,*” “*If I want to do something, I usually don’t let what other people may think stop me,*” and “*I don’t fear losing anything by being silly*”). Double negative questions in the construction of a scale violates one of Kline’s (2005) nine rules when creating an instrument (Lambie, Mullen, Swank, & Blount, 2018). Furthermore, F2F participants expressed confusion when answering the instrument and would ask the researcher for clarification. More specifically, subscales on the APTS (e.g., fun-seeking, uninhibitedness, and spontaneity) may narrow the focus of PF to aspects that are not as transferable to more serious settings such as work. Furthermore, two of the items on the instrument meant to capture spontaneity may capture impulsivity (e.g., “*I often pursue my spur-of-the-moment THOUGHTS,*” and “*I often pursue my spur-of-the-moment FEELINGS*”). Although spontaneity and impulsivity may appear similar, they are different variables as people can be spontaneous without being impulsive (see Klipper, Green, & Prorak, 2010). Therefore, the researcher recommends the development of a new scale to measure playfulness that adheres to stringent instrument development guidelines.

Recommendations for Future Research

The current study examined factors that predicted QOL among adults 55 and older using standard multiple regression. The results of the regression not only align with previous research, but also mirror the research landscape in the field of social sciences. In both the study results as well as the field, the variable of depression has outweighed and overshadowed more positive psychological variables. The reasons for the keen focus on negative psychological traits in the social sciences are varied; they include: (a) better opportunities for funding, (b) more familiarity among individuals, and (c) a greater interest in the societal problems associated with negative traits (Fredrickson, 2005; World Health Organization, 2016). Therefore, although PF and SA accounted for a small amount of variance in QoL (e.g. 1%), researchers are encouraged to continue studying positive traits such as SA and PF. In fact, previous research focused on positive emotions has shown that feelings such as joy, amusement, awe, and hope can protect against life stressors (Garland et al., 2010). Moreover, in a recent 2018 study on positive emotions and dementia, individuals ($N = 4,765$) from the Health and Retirement Study who were dementia free at baseline and over the age of 60 were analyzed for a four-year time period. Participants were divided into two groups, those who carried the gene for dementia (APOE $\epsilon 4$) and those who did not. After adjusting for covariates (e.g., cardiovascular disease, diabetes, baseline cognitive performance, age), logistic regression analysis results indicated that positive age beliefs protected older individuals carrying the dementia gene from developing dementia (RR = .69, 95% CI = .50, .94, $p = .018$). Individuals with positive beliefs about aging who carried the dementia gene, were 49.8% less likely to develop dementia than those who had negative age beliefs (Levy, Slade, Pietrzak, & Ferrucci, 2018). Results indicate that there is

potential in continued exploration of positive mindsets such as playfulness. A more robust and advanced statistical test such as structural equation modeling (SEM) may reveal a more complex relationship among SA, PF, depression, and QoL (Schumaker & Lomax, 2016). Structural equation modeling is a preferred method to confirm complex theoretical models, while accounting for measurement error (Schumaker & Lomax, 2016).

While more robust statistical tests may be necessary, the development of a playfulness instrument with increased clarity is also warranted. In order to do this, the concept of PF needs to be further expanded to include characteristics that are more than fun-seeking. Moreover, PF needs to be clearly differentiated from other characteristics such as humor, zest, spontaneity, and impulsivity. In addition, a broader definition would guide the creation of an instrument that captures the nuances of PF through the use of brief scenarios or decision-making questions. Furthermore, the results from the exploratory questions indicated that future study related to purpose, subjective health, hobbies, and social engagement could be conducted.

Implications

As baby boomers continue to redefine aging, there is growing interest in learning how to age well. In fact, studies on wellness, longevity, happiness, and positive emotions have become cover stories in newspapers and magazines (see Brody, 2017; Kluger & Sifferlin, 2018; Leland, 2017). The increasing focus on wellness and prevention creates implications for counselors, counselor educators, and researchers.

Counseling Implications

It was once said, “The end of life is a non-negotiable thing. The quality and exact length of that life, however, is something we very much have the power to shape” (Kluger & Sifferlin, 2018, p. 50). Counselors have the ability to help individuals shape their stories and their life’s trajectories. As such, counselors are well positioned to help aging adults navigate the transitions from work to retirement, and to find alternative outlets for their energy, drive, and their talents.

Counseling older adults however, may look different than traditional counseling. For instance, researchers have indicated how a person feels physically impacts how they feel emotionally (Enkvist et al, 2012). As such, counselors may want to consider connecting with occupational therapists or rehabilitation counselors to better help adults who may have lost the use of parts of their body. Research has also indicated that Cognitive Behavioral Therapy (CBT) has been beneficial in lessening depressive symptoms (Driessen & Hollon, 2010), therefore, counselors may want to increase or strengthen their CBT skills to better assist older clients who might be suffering from depression. Furthermore, counselors are encouraged to become adept at increasing their knowledge related to changes in support systems, personal identity, and helping aging adults find meaning and purpose in their new roles. Moreover, counselors can help older adults proactively build positive habits and to help build a psychological reserve they could pull from when necessary.

Counselors could also help their older clients tap into their playful side, as results from the current study indicated a negative correlation between PF and depression. Therefore, increasing an individual’s playful side may decrease depressive symptoms. Moreover, as playfulness was also negatively correlated to SA, encouraging clients to engage in their playful

side, could help them to feel younger, which may encourage them to do more which could increase their social connections. Counselors could also support their older clients in exploring different ways to play more, not only as a stress reliever, but also as a way to engage in their hobbies. Both playfulness and hobby engagement provide outlets to increase social connection with others. Lastly, counselors should consider how a client's sense of purpose, or lack thereof, may be influencing other clinical issues. Interventions such as narrative therapy may help individuals develop counter narratives.

Counselor Education

The study of increasing overall QoL is directly connected to the study of wellness. As such, finding ways to increase an individual's level of QoL and lowering depression revolves around wellness concepts. Counselors possess a wealth of information related to wellness. In fact, the foundation of mental health counseling is orientated towards wellness and prevention as well as empowering people to achieve optimal ways of being (Barden, Conley, & Young, 2014; Kaplan, Tarvydas, & Gladding, 2014). In fact, the emphasis on wellness is central to the identity of counselors, as opposed to other mental health professionals (Burck, Bruneau, Baker, & Ellison, 2014). Instead, other specialists such as healthcare professionals, social workers, and coaches are more vocal in carrying messages of wellness and prevention into arenas that counselors could naturally fit (Saliba & Barden, 2017). As such, counselor education programs are encouraged to further educate counselors-in-training in the history and current trends of wellness and to perhaps even consider developing and adopting wellness competencies (Barden et al., 2015). In addition, counseling programs could expand on their human growth and

development courses, as well as tease out topics related to ageism and intergenerational communication in multicultural courses. Furthermore, a dedicated track specializing in counseling aging adults could be created to help counselors-in-training develop the self-efficacy needed to work with clients older than themselves. As Myers once said, “We have, now, the opportunity to truly carve out our niche in the mental health field, to become prime advocates for wellness” (Myers, 1991, p. 189).

Research Implications

Based on the results of this study, further interventions to help reduce or lessen depressive symptoms and/or encourage older individuals to share feelings related to loneliness, isolation or other factors related to depression could be developed. In addition, results from the exploratory questions indicate that future research investigating purpose in aging adults may be warranted. The study of purpose is not new and was in fact introduced by Viktor Frankl in the 1940s in his book *A Man's Search for Meaning*. As Frankl (1946) writes, “Man's search for meaning is the primary motivation in his life and not a ‘secondary rationalization’ of instinctual drives. This meaning is unique and specific in that it must and can be fulfilled by him alone...” (p. 121). Frankl's logotherapy posits that meaning is best understood and expressed through narratives and as such, uses meta-narratives such as myths and legends that resonate with a client to motivate them to create a preferred future (Wong, 2010). Suggested future topics of inquiry are listed below:

1. Given the influence of purpose on SA, PF, depression, and QoL, future studies might involve the development of interventions that emphasize client purpose and evaluate their ability to mitigate the effects of depression.
2. Review of the literature revealed that there is a dearth of psychometrically sound instruments available for assessing playfulness. Therefore, developing such a scale and examining the factor structure of playfulness in older adults is encouraged.
3. Future studies should examine whether playfulness can be fostered in individuals. Such research could shed light on whether playfulness is a trait or a mindset that could be nurtured through clinical intervention.

Chapter Five Summary

In chapter five, the researcher compared the findings from this investigation with previous research on the same variables of interest. The results of this study indicated that SA, PF, and depression predicted QoL among adults 55 and older. When looking at both online and F2F participants together, depression accounted for 46% of the variance, while SA and PF accounted for 1% of the variance. Results from the secondary research question (e.g., 1.B) using sub samples based on recruitment varied. For the F2F participants, all three variables significantly contributed to the regression equation, while for the online participants, only two variables contributed to the model (e.g., PF and depression). In addition, the demographic variables of purpose, subjective health, hobbies, and social connectivity had significant effects on study variables (e.g., SA, PF, depression, and QoL). Overall, the findings of this study

resulted in implications for counselors, counselor educators, and researchers. In addition, the findings contribute to a large body of literature regarding aging adults and QoL.

Picasso once said, “It takes a long time to become young.” Although growing older is inevitable, possessing a frame of mind that embodies youthful engagement is important. As such, understanding the factors that help individuals maintain engagement with life as they age can have a positive lasting impact on themselves and society. Therefore, this study is a call for future researchers to continue to find ways to help individuals age well and age young.

APPENDIX A:
UNIVERSITY OF CENTRAL FLORIDA INSTUTIONAL REVIEW BOARD
APPROVAL LETTER



University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

Determination of Exempt Human Research

From: **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To: **Yvette Saliba El-Habre:**

Date: **December 05, 2017**

Dear Researcher:

On 12/05/2017, the IRB reviewed the following activity as human participant research that is exempt from regulation:

Type of Review: Exempt Determination
Project Title: The Influence of Subjective Age, Playfulness, and Depression
on Quality of Life for Aging Adults
Investigator: Yvette Saliba El-Habre
IRB Number: SBE-17-13535
Funding Agency:
Grant Title:
Research ID: N/A

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these changes affect the exempt status of the human research, please contact the IRB. When you have completed your research, please submit a Study Closure request in iRIS so that IRB records will be accurate.

In the conduct of this research, you are responsible to follow the requirements of the [Investigator Manual](#).

This letter is signed by:

A handwritten signature in black ink, appearing to read "Gillian Morien".

Signature applied by Gillian Morien on 12/05/2017 10:13:45 AM EST

Designated Reviewer

APPENDIX B:
INFORMED CONSENT FOR F2F AND MTurk PARTICIPANTS



The Influence of Subjective Age, Playfulness, and Depression on Quality of Life for Aging Adults

Informed Consent for Research

Principal Investigator: *Yvette Saliba, MA, NCC*
Faculty Advisor: *Sejal Barden, Ph.D.*
Investigational Site(s): *University of Central Florida*

Introduction: Thank you for agreeing to participate in our research. Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study which will include about 1000 people over the age of 55. You have been asked to take part in this research study because you are 55 or older. **For individuals answering this survey online, please note that the data you provide may be collected and used by Amazon as per its privacy agreement. This agreement shall be interpreted according to United States law.**

The principal investigator conducting this research is a Doctoral Candidate within the Department of Education at UCF. Because the researcher is a graduate student, she is being guided by Sejal Barden, Ph.D., a UCF faculty member in the Department of Child, Family, and Community Services.

What you should know about a research study:

- Someone will explain this research study to you.
- A research study is something you volunteer for.
- Whether or not you take part is up to you.
- You should take part in this study only because you want to.
- You can choose not to take part in the research study.
- You can agree to take part now and later change your mind.
- Whatever you decide it will not be held against you.
- Feel free to ask all the questions you want before you decide.

Purpose of the research study: The purpose of this study is to determine the predictive ability of subjective age, playfulness, and depression on quality of life.

What you will be asked to do in the study: Throughout this study, you will complete five assessments designed to measure your subjective age, playfulness, depression and quality of life.

You will be asked to complete a general demographics form and four assessments. The completion of the study will require a total of 5-10 minutes of time.

Location: The researcher will meet participants in locations where they live or attend events in the community, as well as through an online platform (e.g., Amazon Mechanical Turk).

Time required: We expect that it will take you approximately 5-10 minutes to complete the five assessments.

Risks: There are no reasonably foreseeable risks or discomforts involved in taking part in this study. However, it is possible that review of an assessment item may cause you to experience discomfort when reflecting upon questions. If you are uncomfortable, you may withdraw from the completion of this study at any time and seek out a mental health provider near you.

Benefits: We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include the opportunity to reflect on how young or old you may feel (subjective age), how playful you may be, and/or whether or not you are experiencing any depression. This reflection may provide you with an opportunity to grow your awareness of your own mental states.

Compensation or payment: For individuals answering the survey face-to-face, light snacks and non-alcoholic drinks are supplied as a thank you, however, there is no monetary compensation or financial payment to you. For individuals answering this survey on Amazon Mechanical Turk, you will receive \$.50 for assessments that have been completely answered.

Confidentiality: This study is confidential. That means that the principle investigator will secure any personal information that is provided through the completion of the research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, talk to Yvette Saliba, Doctoral Candidate, Counselor Education Program, College of Education by email ysaliba@knights.ucf.edu or Dr. Sejal Barden, Faculty Advisor, Department of Education by email at sejal.barden@ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You want to get information or provide input about this research.

APPENDIX C:
INFORMED CONSENT FOR SENIOR EDUCATIONAL PROGRAM
PARTICIPANTS



The Influence of Subjective Age, Playfulness, and Depression on Quality of Life for Aging Adults

Informed Consent for Research

Principal Investigator: *Yvette Saliba, MA, NCC*
Faculty Advisor: *Sejal Barden, Ph.D.*
Investigational Site(s): *University of Central Florida*

Introduction: Thank you for agreeing to participate in our research. Researchers at the University of Central Florida (UCF) study many topics. To do this we need the help of people who agree to take part in a research study. You are being invited to take part in a research study which will include about 1000 people over the age of 55. You have been asked to take part in this research study because you are 55 or older.

The principal investigator conducting this research is a Doctoral Candidate within the College of Education and Human Performance at UCF. Because the researcher is a graduate student, she is being guided by Sejal Barden, Ph.D., a UCF faculty member in the College of Education and Human Performance.

What you should know about a research study:

- Someone will explain this research study to you.
- A research study is something you volunteer for.
- Whether or not you take part is up to you.
- You should take part in this study only because you want to.
- You can choose not to take part in the research study.
- You can agree to take part now and later change your mind.
- Whatever you decide it will not be held against you.
- Feel free to ask all the questions you want before you decide.

Purpose of the research study: The purpose of this study is to determine the predictive ability of subjective age, playfulness, and depression on quality of life.

What you will be asked to do in the study: Throughout this study, you will complete five assessments designed to measure your subjective age, playfulness, depression and quality of life. You will be asked to complete a general demographics form and four assessments. The completion of the study will require a total of 5-10 minutes of time.

Time required: We expect that it will take you approximately 5-10 minutes to complete the five assessments.

Risks: There are no reasonably foreseeable risks or discomforts involved in taking part in this study. However, it is possible that review of an assessment item may cause you to experience discomfort when reflecting upon questions. If you are uncomfortable, you may withdraw from the completion of this study at any time and seek out a mental health provider near you.

Benefits: We cannot promise any benefits to you or others from your taking part in this research. However, possible benefits include the opportunity to reflect on how young or old you may feel (subjective age), how playful you may be, and/or whether or not you are experiencing any depression. This reflection may provide you with an opportunity to grow your awareness of your own mental states.

Confidentiality: This study is confidential. That means that the principle investigator will secure all data received from the completion of the research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, or think the research has hurt you, talk to Yvette Saliba, Doctoral Candidate, Counselor Education Program, College of Education at (321) 277-6467 or by email ysaliba@knights.ucf.edu or Dr. Sejal Barden, Faculty Advisor, Department of Education at (407) 823-1748 or by email at sejal.barden@ucf.edu.

IRB contact about your rights in the study or to report a complaint: Research at the University of Central Florida involving human participants is carried out under the oversight of the Institutional Review Board (UCF IRB). This research has been reviewed and approved by the IRB. For information about the rights of people who take part in research, please contact: Institutional Review Board, University of Central Florida, Office of Research & Commercialization, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901. You may also talk to them for any of the following:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.
- You want to get information or provide input about this research.

APPENDIX D:
GENERAL DEMOGRAPHIC QUESTIONNAIRE

GENERAL DEMOGRAPHIC QUESTIONNAIRE

Instructions: Please complete sections 1-11 by selecting the most appropriate option
(All responses are confidential):

1. What is your age?

- | | |
|-------|-------|
| 55-60 | 76-80 |
| 61-65 | 81-85 |
| 66-70 | 86-90 |
| 71-75 | 91+ |

2. Please indicate your gender:

- Male
- Female
- Other (please state): _____

3. What is your race

- American Indian or Alaska Native
- Asian
- Black or African American
- Bi-racial/Multiracial
- Caucasian
- Native Hawaiian or other Pacific Islander
- Other (please state): _____

4. What is your ethnicity

- Hispanic or Latino
- Not Hispanic or Latino

5. What is your current relationship status?

- Single
- Married or in a committed relationship
- Widowed

6. Do you feel your life has purpose?

- Yes
- No

APPENDIX E:
SINGLE ITEM SUBJECTIVE AGE QUESTION AND THE COGNITIVE AGE
SCALE

Instructions: Please answer the below questions to the best of your ability.

1. Please write down your age:

2. Sometimes people feel older or younger than their age. During the **last month**, what age did you **feel** most of the time?

Instructions: Please check which age you **feel** you belong in for each of the following four questions:

20's 30's 40's 50's 60's 70's 80's

1. I **feel** as though I am
in my—

2. I **look** as though I am
in my—

3. I **do** most things as
though I were in
my—

4. My **interests** are
mostly those of a
person in his/her—

APPENDIX F: ADULT PLAYFULNESS TRAIT SCALE (APTS)

Instructions: Below are a number of statements that can be used to describe people and their beliefs in general. Please respond as accurately as possible by indicating the extent to which you agree or disagree with each statement:

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree/Disagree	Slightly Agree	Moderately Agree	Strongly Agree
1. I don't always follow rules	1	2	3	4	5	6	7
2. When someone else starts something that is fun, I'm happy to follow along	1	2	3	4	5	6	7
3. Sometimes I can do things without worrying about consequences	1	2	3	4	5	6	7
4. I try to have fun no matter what I am doing	1	2	3	4	5	6	7
5. I often do unplanned things	1	2	3	4	5	6	7
6. I can find fun in most situations	1	2	3	4	5	6	7
7. I appreciate fun things started by other people	1	2	3	4	5	6	7
8. I often do things on the spur of the moment	1	2	3	4	5	6	7

	Strongly Disagree	Moderately Disagree	Slightly Disagree	Neither Agree/ Disagree	Slightly Agree	Moderately Agree	Strongly Agree
9. If I want to do something, I usually don't let what other people may think stop me	1	2	3	4	5	6	7
10. I believe in having a good time	1	2	3	4	5	6	7
11. I often act upon my impulses	1	2	3	4	5	6	7
12. I understand social rules but most of the time I am not restricted by them	1	2	3	4	5	6	7
13. I am often the person who starts fun things in a situation	1	2	3	4	5	6	7
14. I enjoy fun things that other people initiate	1	2	3	4	5	6	7
15. I often pursue my spur-of-the-moment THOUGHTS	1	2	3	4	5	6	7
16. I often follow my spur-of-the-moment FEELINGS	1	2	3	4	5	6	7
17. I think fun is a very important part in life	1	2	3	4	5	6	7
18. I don't fear losing anything by being silly	1	2	3	4	5	6	7
19. I can make almost any activity fun for me to do	1	2	3	4	5	6	7

APPENDIX G: GERIATRIC DEPRESSION SCALE: SHORT FORM

Instructions: Please choose the best answer for how you have felt over the **past week**:

YES NO

- | | | |
|---|-----|----|
| 1. Are you basically satisfied with your life? | YES | NO |
| 2. Have you dropped many of your activities and interests? | YES | NO |
| 3. Do you feel that your life is empty? | YES | NO |
| 4. Do you often get bored? | YES | NO |
| 5. Are you in good spirits most of the time? | YES | NO |
| 6. Are you afraid that something bad is going to happen to you? | YES | NO |
| 7. Do you feel happy most of the time? | YES | NO |
| 8. Do you often feel helpless? | YES | NO |
| 9. Do you prefer to stay at home, rather than going out and doing new things? | YES | NO |
| 10. Do you feel you have more problems with memory than most? | YES | NO |
| 11. Do you think it is wonderful to be alive now? | YES | NO |
| 12. Do you feel pretty worthless the way you are now? | YES | NO |
| 13. Do you feel full of energy? | YES | NO |
| 14. Do you feel that your situation is hopeless? | YES | NO |
| 15. Do you think that most people are better off than you are? | YES | NO |

APPENDIX H:
SATISFACTION WITH LIFE SCALE

Instructions: Below are five statements that you may agree or disagree with. Using the scale below, please indicate your agreement with each item by selecting the appropriate answer. Please be open and honest in your responding.

	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree/ Disagree	Slightly Agree	Agree	Strongly Agree
1. In most ways my life is close to my ideal	1	2	3	4	5	6	7
2. The conditions of my life are excellent	1	2	3	4	5	6	7
3. I am satisfied with my life	1	2	3	4	5	6	7
4. So far, I have gotten the important things I want in life	1	2	3	4	5	6	7
5. If I could live my life over, I would change almost nothing	1	2	3	4	5	6	7

APPENDIX I:
EMAIL ON SUBJECTIVE AGE PROPORTIONAL DISCREPANCY SCORES
WITH THE CAS

2/18/2018

RE: Determining Subjective Age - Yvette Salibaelhabre

RE: Determining Subjective Age

Terracciano, Antonio <antonio.terracciano@med.fsu.edu>

Tue 7/18/2017 10:39 AM

To: Yvette Salibaelhabre <ysaliba@Knights.ucf.edu>;

Hello Yvette,

Your project sounds interesting and the 4 items seem a good approach.

I think it does not matter whether you calculate the discrepancy score before or after you calculate the average.

I would check the internal consistency before averaging. If Cronbach's alpha is reasonable (maybe >.50), the average could be your primary measure, with analyses of each item as a follow-up. The higher the alpha the stronger the rationale for combining the 4 items.

Cheers,
Antonio

From: Yvette Salibaelhabre [mailto:ysaliba@Knights.ucf.edu]

Sent: Monday, July 17, 2017 7:02 AM

To: Terracciano, Antonio <antonio.terracciano@med.fsu.edu>

Subject: Determining Subjective Age

Hello Dr. Terracciano,

Please forgive the intrusion of this email, I know you are very busy, but I had a question related to subjective age.

First, my name is Yvette Saliba and I am a doctoral candidate in the Counselor Education program at the University of Central Florida. I am very interested in the concept of subjective age and would like to use it as a part of my dissertation. In short, my focus is on aging adults and playfulness and how those factors impact quality of life.

I've been reading about subjective age for awhile now and my question comes down to implementation. I realize there are several ways of asking how old an individual feels, the simplest being to obtain a proportional discrepancy score from one question. However, I am interested in utilizing the four questions put forward by Barak (I believe) and evaluated by Tiescher in 2009 using SEM: "I feel as if I was...years," "I look as if I was...years," "I act as if I was...years" and "my interests are those of someone who is...years."

My question is: if I were to use those questions, and I wanted to obtain proportional discrepancy scores, would I average the answers of those four questions together first and then determine my proportional discrepancy score or would I obtain a proportional discrepancy score for each question and average those together? Or no averaging at all?

Again, I realize you are very busy and may not have the time to answer this question from a complete stranger, but any guidance you could provide would be helpful. Unfortunately, none of my faculty members have utilized subjective age before and I would appreciate any guidance you could offer.

Thank you,

Yvette Saliba, MA, NCC

Counselor Education Ph.D. Candidate

Toni Jennings Scholar

University of Central Florida

College of Education and Human Performance

Department of Child, Family, and Community Services

(321) 233-5253

ysaliba@knights.ucf.edu

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APPENDIX J:
EMAIL ON SUBJECTIVE AGE PROPORTIONAL DISCREPANCY SCORES

2/2/2018

Re: Question regarding Subjective Age Discrepancy Sc... - Yvette Salibaelhabre

Re: Question regarding Subjective Age Discrepancy Scores

Dana Kotter-Grühn <dana.kotter@gmail.com>

Mon 9/18/2017 9:17 AM

To: Yvette Salibaelhabre <ysaliba@Knights.ucf.edu>;

Hi Yvette,

you are correct. Different research teams do calculate subjective age differently but essentially it is the very same thing. To give you an example for each:

1) If $[(\text{Subjective Age} - \text{Chronological Age}) / \text{Chronological Age}]$: for a 90 year old person who feels like 70 we calculate $70 - 90 = -20$ (I am leaving out the divided by chronological age because that is the same in both approaches) --in this case, the score of -20 indicates that the person feels 20 years younger than he/she is. Conversely, for a 90 year old who feels like 100, we calculate $100 - 90 = +10$ --> a positive score indicates that the person feels older than he/she is. Taken together, **a positive score indicating an older SA and a negative score indicating a younger SA**

2) If $[(\text{Chronological Age} - \text{Felt age}) / \text{Chronological Age}]$: for a 90 year old who feels like 70 (same example as above) we calculate $90 - 70 = +20$ --> the positive value indicates that the person feels 20 years younger than he/she is. For a 90 year old who feels like 100, we calculate $90 - 100 = -10$ --> a negative score indicates that the person feels older than he/she is. Taken together, **a positive value indicating a youthful age and negative age indicating an older subjective age.**

You see that in both cases the value is the same, just the + or - is different. As long as you are consistent in your calculations, it does not matter. For me personally, I found it easier to relate to the idea that a negative score means that someone feels younger - but that is a personal preference. Some of my colleagues prefer the opposite. I suggest you use whatever is easier for yourself to understand and communicate.

I hope this helps. Good luck with your research project!
Best, Dana

On Mon, Sep 18, 2017 at 8:04 AM, Yvette Salibaelhabre <ysaliba@knights.ucf.edu> wrote:

Hello Dr. Kotter-Grühn,

Please forgive the intrusion of this email, I recognize that you are very busy. I am doctoral candidate at the University of Central Florida in the Counselor Education department. I am currently looking at the construct of Subjective Age for part of my dissertation and I noticed a slight discrepancy among researchers with calculating the SA discrepancy scores and I was wondering if you could please shed a little light on this for me.

Several researchers are saying the opposite of others. For instance, I found that some researchers have stated that the formula for determining SA should be: $[(\text{Subjective Age} - \text{Chronological Age}) / \text{Chronological Age}]$ with **a positive score indicating an older SA and a negative score indicating a younger SA**. (see Kotter-Grühn et al., 2015; Kotter-Grühn et al., 2015; Kotter-Grühn & Hess, 2012; Rubin & Bernsten, 2006; Choi et al., 2014; Kleinspeh-Ammerlahn et al., 2008; Spuling et al., 2013).

Conversely other researchers have stated that the formula is $[(\text{Chronological Age} - \text{Felt age}) / \text{Chronological Age}]$ with **a positive value indicating a youthful age and negative age indicating an older subjective age**. (See Stephen et al., 2016; Stephen et al., 2014; Mock & Eibach, 2011; Westerhof & Barrett, 2005).

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APPENDIX K:
PERMISSION FOR FIRST RETIREMENT APARTMENTS

1/28/2018

Gmail - Re: contacts for surveys



Evie E <ysaliba@gmail.com>

Re: contacts for surveys

1 message

Plymouth Manager <Plymouth@allied-orion.com>
To: "ysaliba@gmail.com" <ysaliba@gmail.com>

Fri, Jan 5, 2018 at 1:44 PM

It has been decided because the survey is a bit long it would be best to distribute...

Diane Phillips
Property Manager
The Plymouth Apartments

[1550 Gay Road | Winter Park, FL 32789](#)
plymouth@allied-orion.com
P: 407-644-4551

PLEASE NOTE: Florida has a very broad public records law (F.S.119). All emails to and from the Winter Park Housing Authority and its management company, Allied Orion, are kept as public record. **Your email communications, including your email address and other personally identifying information included in your emails may be disclosed to the public and media at any time.**

From: ysaliba@gmail.com <ysaliba@gmail.com>
Sent: Wednesday, January 3, 2018 1:12 PM
To: Plymouth Manager
Subject: Re: contacts for surveys

Great, thank you!

Yvette

On Jan 3, 2018, at 3:56 PM, Plymouth Manager <Plymouth@allied-orion.com> wrote:

Thank you for your e-mail, I will met with the President of the Resident Association and get back to you.

Diane Phillips
Property Manager
The Plymouth Apartments

[1550 Gay Road | Winter Park, FL 32789](#)
plymouth@allied-orion.com

<https://mail.google.com/mail/u/0/?ui=2&ik=09e4bbeb68&jsver=diY4ZTwxD6E.en.&view=pt&q=Plymouth%40allied-orion.com&qs=true&search=query&th=160c7...> 1/3

APPENDIX L:
PERMISSION FOR SECOND RETIREMENT HOUSING FACILITY



Evie E <ysaliba@gmail.com>

RE: UCF Older Adult Research/Dissertation

1 message

Jana Ricci <jana@themayflower.com>
To: yvette <ysaliba@gmail.com>

Wed, Jan 3, 2018 at 9:24 AM

I have a copy of the survey, I think, right? I can just print some here and collect for you.
How many are you shooting for?

Jana Ricci
Director of Marketing
The Mayflower
1620 Mayflower Court
Winter Park, FL 32792
(407) 672-1620
www.themayflower.com

From: yvette [mailto:ysaliba@gmail.com]
Sent: Wednesday, January 03, 2018 8:18 AM
To: Jana Ricci
Subject: Re: UCF Older Adult Research/Dissertation

Hello Ms. Ricci,

Thank you so much for getting back to me! This is wonderful! I just wanted to clarify with you, are you asking for me to give you surveys and you will get them filled out, or did you want me to come to the Mayflower and meet with residents to ask them to fill out the surveys? I am happy to do either, but what would work best for you? If you'd like to just take surveys, how many do you think would be interested in filling them out? I'm happy to bring you however many you think would enjoy taking it.

Thank you,

Yvette

APPENDIX M:
PERMISSION FOR SENIOR EDUCATIONAL PROGRAM PARTICIPANTS

1/28/2018

Re: LIFE at UCF Question - Yvette Salibaelhabre

Re: LIFE at UCF Question

Richard Tucker <Richard.Tucker@ucf.edu>

Fri 12/8/2017 12:30 PM

To: Yvette Salibaelhabre <ysaliba@Knights.ucf.edu>;

Cc: Lee Cross <leecross22@yahoo.com>; Sejal Barden <Sejal.Barden@ucf.edu>; meitinlifeucf@gmail.com <meitinlifeucf@gmail.com>;

 3 attachments (430 KB)

Saliba_Survey.pdf; Determination of Exempt.pdf; Study Synopsis.docx;

Yvette: Dr. Cross and I have had a chance to review your materials and your request to make this research opportunity available to members of LIFE at UCF. We're pleased that you have finally received your IRB approval. We assume that the materials you have shared with us have already been approved by Dr. Barden and your committee. If so, a brief confirming e-mail from Dr. Barden would be appreciated. Overall, we think the study will be of interest to LIFE members, and the task demands are quite reasonable. We're pleased that you have agreed with our recommendation that the survey be administered on-line through the LIFE at UCF list serve. Given the size of our group (now at 750 members), distributing and collecting hard copy surveys would be cumbersome.

While we can appreciate your desire to gather your data as soon as possible, we agree with your recognition that the holiday break would NOT be a good time to distribute the survey. You need to wait until January 16 to make your brief presentation at the second LIFE meeting of Spring term. We already anticipate that our announcement period will be very busy at the first class on January 9. That presentation of a maximum of 2-3 minutes would be made sometime during the announcement period which is from 8:45 - 9:00 a.m. Then we will have a place for you to be available to interested members during the break from 10:00 - 10:30 a.m. for Q&A. Since the survey will be sent out to the entire membership for their option to participate, there would not be a need to have coffee/donuts available during the break. Note that we are copying LIFE President Julian Meitin so he is aware of our recommendation about an announcement on January 16.

We would arrange to send out your survey that afternoon with the appropriate attachments. The detailed informed consent agreement and the summary of the study should provide sufficient information for the members to decide if they wish to participate. You'll need to make sure that everything is prepared to be sent out as an e-mail with the attachments or links.

We do have some questions about the Amazon Mechanical Turk as the format you have indicated for the online survey. We have not had an experience with this format and note that you indicate that Amazon has the right to have access to the data. While the survey would be anonymous, we'd like more information about their privacy policies. Have you considered any other formats? Also, the "reward" provided by Amazon is not an important factor for LIFE members, so other formats can certainly be used.

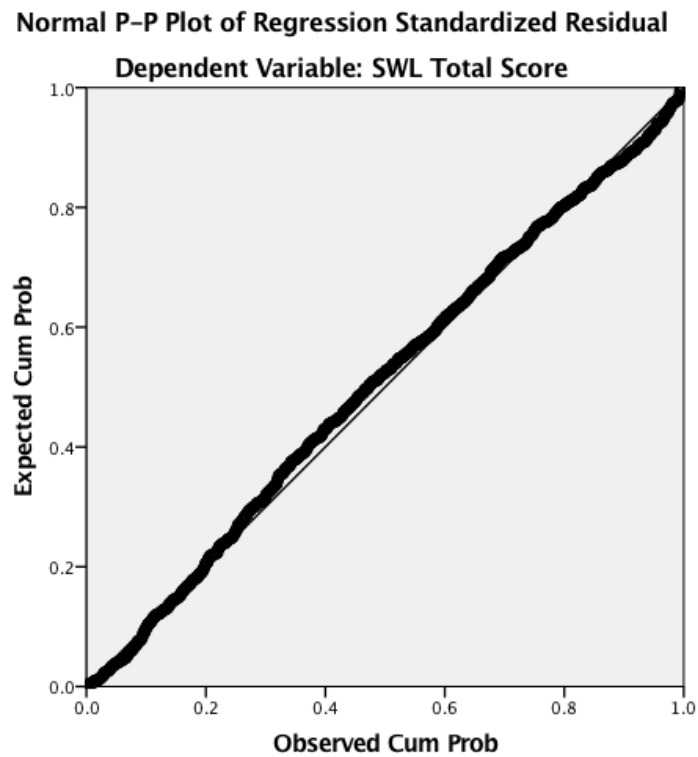
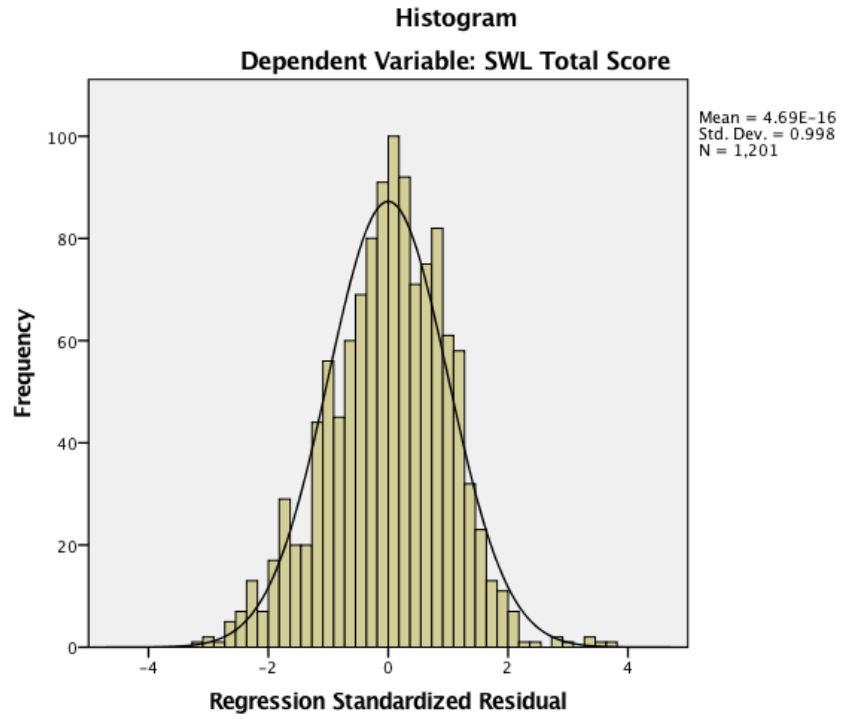
After you've had a chance to confer with Dr. Barden, let us know how you want to proceed. We look forward to hearing from you. Let us know if you have any questions about our recommendation. Regards, Dick Tucker

p.s. One small editorial suggestion. In introducing yourself, you refer to the "Department of Education". That should be the "College of Education and Human Performance". That should also be added to your description of Dr. Barden's academic affiliation.

Richard D. Tucker, Ph.D.
Professor Emeritus of Psychology and Aging Studies
UCF Liaison to the Learning Institute for Elders

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APPENDIX N:
HISTOGRAM AND P-P PLOT RESULTS



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