

THE EFFECTS OF A BRIEF SOCIAL INTERGENERATIONAL INTERACTION FOR
OLDER AND YOUNGER ADULTS

by

Cindy B. Woolverton

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A Dissertation Submitted to the Faculty of the

DEPARTMENT OF PSYCHOLOGY

In Partial Fulfillment of the Requirements

For the Degree of

DOCTOR OF PHILOSOPHY

In the Graduate College

THE UNIVERSITY OF ARIZONA

2020

THE UNIVERSITY OF ARIZONA
GRADUATE COLLEGE

As members of the Dissertation Committee, we certify that we have read the dissertation prepared by: Cindy Bevie Woolverton
titled: The Effects of Intergenerational Social Interactions on Older and Younger Adults

and recommend that it be accepted as fulfilling the dissertation requirement for the Degree of Doctor of Philosophy.

Dr. Elizabeth Glisky

Dr. Elizabeth Glisky

Date: Jul 2, 2020

Mary-Frances O'Connor

Mary-Frances O'Connor

Date: Jul 2, 2020

Matthias R Mehl

Matthias R Mehl

Date: Jul 2, 2020

Matthew Dennis Grilli

Matthew Dennis Grilli

Date: Jul 2, 2020

Final approval and acceptance of this dissertation is contingent upon the candidate's submission of the final copies of the dissertation to the Graduate College.

I hereby certify that I have read this dissertation prepared under my direction and recommend that it be accepted as fulfilling the dissertation requirement.

Dr. Elizabeth Glisky

Dr. Elizabeth Glisky
Dissertation Chair

Date: Jul 2, 2020

ACKNOWLEDGEMENTS

I would like to thank my advisor, Elizabeth Glisky for her support, wisdom and guidance throughout my graduate career. To the committee members, Drs. Matthew Grilli, Matthias Mehl, and Mary-Frances O'Connor, as well as Anne Bowen, for their valuable recommendations throughout this process.

This project would not have been possible without the incredible contributions of the study's participants who demonstrated genuine interest in the topic of connecting generations. L'Don Sawyer, Sally Krommes, Frances Donnellan, Abbie Stone, Joanne Sherrill, Sonya Hernandez, and Maria Powers, I appreciate the critical role each of you played in the coordination of this project. Thank you to the Psychology Department and College of Science for your support in providing students the opportunity to learn from our older adult participants.

I have the deepest gratitude to the extraordinary team of research assistants and graduate students who I was fortunate to work with on this project: Anna Robertson, Mingzhu Hou, Aubrey Wank, Dedaar Karimzadeh, Melissa Guemez, Yecenia Villarreal, Mei Mauric, Blake Samsill, Natasha Nutley, and Max Elias. Many thanks to Anna Robertson, for your flexibility, care, and insight throughout the project.

Finally, I would like to thank my family and friends for their support through my educational journey. To my incredible partner, Kevin Todd, for always being there.

DEDICATION

To my grandparents and grandaunt,
who taught me the grace, strength,
and meaning of aging.

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Abstract

The aging population in the United States is estimated to reach 98 million by the year 2060. Promoting successful aging is important in maintaining the quality of life and independence for the growing population of older adults. Further efforts to provide comprehensive healthcare for older adults may help maintain independence; however, careers in geriatrics are less sought after, resulting in fragmented and costly healthcare. This lack of interest in geriatric careers may be impacted by a lack of exposure to these careers. To address this concern, the present study evaluated the effect of a brief social intergenerational interaction for both young and older adults with the following aims: 1) to evaluate the effect of social interaction on older adults' cognition, social and psychological well-being; and 2) assess the effects of intergenerational interactions on young adults' changes in attitudes and anxiety about aging, quality of communication with older adults, and interest in careers in geriatrics.

Ninety-two older adults living in assisted and independent living communities participated in either a social or control group and completed a battery of cognitive and social well-being measures. Older adults in the social group were recruited to meet with students and share their life stories. Thirty-seven undergraduate and graduate students completed questionnaires prior to meeting with older adults in the social condition. Students and older adults met weekly for three consecutive weeks. The students wrote a book about each older adult's life story, which was printed and presented to the older adult in a fourth final visit at the end of the semester. Participants then completed post measures.

Results demonstrated changes in older adults' performance on measures of attention and executive functions in both the social and control groups; however, mean differences appeared to be larger for the social group. There were reductions in older adults' negative reactions to thinking about aging and lower levels of aging anxiety in both social and control groups. Young adults reported a decrease in anxiety about interacting with older adults and improvement in views about emotional well-being with aging. Additionally, young adults demonstrated an improvement in the quality of their communication skills.

Qualitative data revealed themes of developing a meaningful connection, learning about each other, and challenging of previously held beliefs for both the young and older adults. In addition, older adult participants reported feeling valued and shared their views about the program. Young adult participants shared how they learned factual information about the world through these interactions and felt this was a valuable experience that provided them with skills necessary for their future careers. Brief intergenerational social interactions can provide cognitive and social benefits for older adults as well as improve college students' attitudes towards older adults.

Chapter 1. Introduction

The aging population in the United States is estimated to reach 98 million by the year 2060 with one out of five Americans being over the age of 65 by 2030 (Colby, 2015; Vincent, 2010). Older adults will thus represent a greater percentage of individuals in our communities and place greater demands on our healthcare services with aging-related concerns (e.g., medical comorbidities and cognitive changes). Alzheimer's disease and other dementias that present with cognitive decline impact a person's ability to function well independently, resulting in the need for higher level care (e.g., assisted living, memory care, and long-term care). These care options are costly, averaging \$275 a day (Alzheimer's Association, 2019). In 2018, the cost of care for those with dementia was estimated around \$227 billion, not including the cost of caregiver support; this cost increased to \$290 billion in 2019 (Alzheimer's Association, 2019), and is expected to increase to \$305 billion in 2020 (Alzheimer's Association, 2020). Therefore, efforts to understand factors that mitigate cognitive decline and promote living independently for longer times would have both individual and societal impacts. To this end, research has explored the areas of cognitive interventions, health and physical factors, and more recently the impact of social engagement. Longitudinal studies have found that those who were socially active had fewer physical and cognitive problems across time (Thomas, 2011), suggesting that social engagement is an important factor that could impact aging. Considerably less work has focused on the effectiveness of social interventions on older adults' cognition and well-being. Thus, the purpose of the present study was to explore the effectiveness of a brief social intergenerational intervention for older adults.

Social Engagement and Aging

Aging is associated with many changes that may impact an individual's social engagement (e.g., retirement, widowhood, loss of family and friends), making it more challenging to remain socially active. Additionally, increasing health problems and physical limitations may result in a person being home-bound and having decreased activity levels. Decreases in social involvement have been shown to be related to declines in mental health and increases in feelings of loneliness (Penninkilampi, Casey, Singh & Brodaty, 2018). Social isolation and loneliness, however, although often used interchangeably, are two separate constructs. Social isolation represents a decrease in social activities, and loneliness refers to subjective feelings of not having an adequate social support system. Among a sample of community-dwelling older adults in Ireland, approximately 35% reported they felt lonely over the past month and loneliness was associated with decreased happiness and satisfaction with one's life. Those who felt lonely had a 61% risk of depression (Golden et al., 2009). Social isolation, whether measured subjectively or objectively, has been found to be associated with significant decreases in psychological well-being and increased depression symptoms (Taylor, Taylor, Nguyen & Chatters, 2016). Conversely, remaining socially engaged has been significantly associated with lower depression scores on the CES-D across time (Glass, De Leon, Bassuk & Berkman, 2006). Additionally, social engagement has been associated with lower anxiety, increased self-reported ratings of happiness, and better quality of life among a sample of community-dwelling participants (Golden, Conroy & Lawlor, 2009).

Increases in social isolation are associated with decreases in functional status and health. One longitudinal study measured loneliness, engagement in social events, and

physical functions (i.e., measures of gait speed and ADLs; Shankar, McMunn, Demakakos, Hamer & Steptoe, 2017). Isolation and loneliness at baseline were associated with slower gait speed, and loneliness was associated with increased difficulties completing ADLs over a six-year period (Shankar, McMunn, Demakakos, Hamer & Steptoe, 2017). Further, increased levels of loneliness were associated with the risk of frailty among a population of older adults who participated in the Health Survey for England; however, social isolation was not associated with a change in frailty (Gale, Westbury & Cooper, 2018). With regard to health, adults aged 50+ who were more socially isolated were found to have a higher incidence of chronic illnesses, decreased quality of life, and less physical activity (Cantarero-Prieto, Pascual-Saez & Blazquez-Fernandez, 2018).

Social disengagement has also been related to declines in cognitive functioning. One particular longitudinal study differentiated between older adults' social support (e.g., assistance with instrumental activities) and social engagement (e.g., participating in social activities) and found that social engagement mitigated declines in age-related cognitive processes, whereas social support did not (Sherifian & Gruhn, 2019). This has also been investigated at the neurological level. A longitudinal study found that older adults with lower levels of social engagement had a significantly steeper rate of decline in cognitive functioning and higher levels of beta amyloid (Biddle et al., 2019). Although studies have found a relationship between social engagement and cognition, the direction of the relation is less clear. According to the literature to date, it is unknown whether social disengagement results in a decline in cognition, if social disengagement is a result of cognitive decline, or if these constructs are bidirectional. For example, using a cross-

lagged model, Ayalon and colleagues (2016) found a significant effect of memory functioning on loneliness, whereas the reverse was non-significant, leading to more questions about the temporal relationship between loneliness and cognition and a need for more work in this area.

Intervention work in this area has so far been focused on understanding the mechanisms of change for improving emotional wellbeing and cognition among older adults using a variety of social engagement designs. For example, older adults who participated in a 12-month choir program in their community reported benefits on measures of loneliness and interest in life (Johnson et al., 2018). One particular intervention study designed a computer interface called PRISM, which included multiple features (e.g., email, internet, calendar and community) and targeted socially isolated older adults to learn this program. Results indicated a benefit for those using the PRISM interface on measures of loneliness, well-being and social support, with most participants indicating how helpful the email feature was to keep in contact with friends and family (Czaja, Boot, Charness, Rogers & Sharit, 2018).

Remaining socially engaged also has cognitive benefits for older adults. For example, Myhre, Mehl and Glisky (2016) found cognitive benefits of engaging older adults via Facebook. They compared those who learned and used Facebook to two other groups of older adults: one that was trained how to use an online diary site, and a wait-list control group. Benefits for the Facebook group were seen in executive functions, particularly in “updating,” which represents the ability to monitor and revise information held in working memory (Myhre, 2016). A study by Park et al. (2014) was designed to improve cognitive functions among older adults by engaging them with others in a group

to learn a new skill (e.g., quilting), thus incorporating both cognitively demanding skills and social engagement. This study found improvements in the cognitive domain of episodic memory; however, it was unclear how much of the effect was related to cognitive stimulation versus social engagement. In another study, Park and colleagues (Chan, Haber, Drew & Park, 2014), attempted to understand more about the effects of a cognitively-stimulating task compared to social engagement. In one condition older adults were taught to use an iPad. This condition was compared to a social condition, in which people engaged socially but did not learn a cognitive task, and a control group. The results indicated that the group that learned a new skill had greater gains on measures of episodic memory and processing speed. It is important to note, however, that here too there was a significant social component in the group that learned the new skill, making it challenging to disentangle the effects of learning a new skill from the benefits of social engagement.

Although it is widely accepted that social engagement is important, there has been relatively little research focused on how older adults may benefit from social interventions, especially with regard to cognitive functioning. Most intervention studies to date have required extensive time to implement, and few studies have explored the efficacy of brief interventions.

Growing Clinical Needs of an Aging Population

With the number of older adults increasing, there is an increased need and demand for healthcare professionals with specialized training in geriatrics. Although it has been well recognized that careers specializing in geriatric care are in high demand (Kovner, Mezey, & Harrington, 2002; Center for Health Workforces Studies, 2005;

Brummel & Ferrante, 2018), there continues to be a limited number of people pursuing training in geriatrics (Lamascus, Bernard, Barry, Salerno & Weiss, 2005).

The consequences of a small and/or unprepared workforce are also well recognized. First, if healthcare professionals do not receive proper training in geriatrics and comprehensive care, older adults may not receive adequate community-based support for their medical needs (Coleman, Perry, Chalmers & Min, 2006), ultimately resulting in increased healthcare costs. Coleman and colleagues (2006) found that providing patients a transition coach (an individual trained in older adults' healthcare needs) led to a decrease in rehospitalization rates as well as reduced costs. Others have recognized the need for providing specialized training to assist with transitions from medical facilities for older adults with hip replacements, frailty, or other health problems in order to reduce hospitalizations (Kessler, Williams, Moustoukas & Pappas, 2013). However, the results have been mixed with some demonstrating that their programs are cost-effective while others do not. Programs with an emphasis on geriatric care that elucidate the complexity of medical conditions in an aging society are needed. Such programs could improve continuous care for older people. Studies suggest that geriatric care programs reduce unnecessary hospitalizations, medications, and replication of services (Coleman et al., 2006; Rowe, Fulmer, & Fried, 2016). Therefore, finding ways to interest and recruit young people to seek training and pursue careers in geriatric services is vital.

Barriers to Increasing a Geriatric Care Workforce

Although there have been improvements in the development of more geriatric-focused programs, there continues to be no change in the number of individuals seeking opportunities in geriatric medicine. Recent match results indicated that 82.1% of the

Geriatric Family Medicine programs and 65.1% of the Geriatric Internal Medicine had unfilled positions (National Resident Matching Program, 2020). There are currently about 7,000 physicians who are trained geriatricians in the United States of America, which is estimated to be well below what is needed given our changing population (America's Health Rankings analysis of American Geriatrics Society, 2016; U.S. Department of Health and Human Services, 2017). Thus, the shortage of individuals specialized in providing services to aging populations extends from gerontology to geriatric careers.

Reasons for this workforce shortage are multifactorial. Research indicates it may be related to a lack of knowledge about careers working with older adults, lack of exposure or experiences working with older adults, little perceived reward and interest, less focus on funding for specialized training and education, and ageist views towards older adults (Curran et al., 2015; Meiboom, de Vries, Hertogh, & Scheele, 2015). Geriatric-focused careers are not well publicized and continue to receive less attention in medical and college curricula, regardless of the known importance. Additionally, careers in geriatrics are viewed to be less financially rewarding (Golden, Xu, Wan & Issenberg, 2016; Grisham, 2017; Medical Group Management Association, 2011), as fields focusing on geriatric care continue to be lower paying despite the extra educational training requirements. Healthcare positions in this field tend to require more time per patient to provide adequate care (Golden et al., 2016), which can limit the number of patients seen in a workday. Further, healthcare professionals rely primarily on Medicare for reimbursement of these services, which may reduce overall income (Weeks & Wallace, 2004). Other reasons for this lack of interest have been related to the view that jobs in geriatrics may not provide the same sense of satisfaction in helping someone get better,

as it is incorrectly but typically viewed that older adults will not demonstrate long-term clinical improvement (Higashi, Tillack, Steinman, Johnston & Harper, 2013). Medical students reported feeling disappointment and frustration when caring for elderly patients partly because of lack of satisfaction, but also because of the increased time needed to communicate with these patients to provide proper care (Higashi et al., 2013). They state that elderly patients share “petty” or “irrelevant” information, speak slowly, are hard of hearing and repeat themselves (Higashi et al., 2013). These views are consistent with negative age stereotypes and have potentially detrimental influences on our society as we try to adapt to the growth of an aging population.

Aging stereotypes are common among individuals across the lifespan (for a review see Levy & Macdonald, 2016). These views are primarily negative, such as older adults are less competent, unable to do things physically, grouchy etc. However, stereotypes can also be positive (i.e., older adults are wise, warm). Nevertheless, aging stereotypes often have negative influences on both older and younger adults (Lamont, Swift & Abrams, 2015).

Aging Stereotypes

The long-term impact of stereotypical views about aging have not been well investigated in younger adults. However, there is some evidence that negative views towards aging have negative consequences with respect to health and risk-taking behaviors among young and middle aged adults. For example, healthy adults ages 18-49 were followed for 38 years and those who held more negative age stereotypes at the first time point were at greater risk for cardiovascular events later in life and these findings were similar among a more age-restricted younger sample (ages 18-39) (Levy,

Zonderman, Slade & Ferrucci, 2009). Further, in a sample of young undergraduates, those who held more negative views about aging using the Fraboni Scale of Ageism and Relating to Older People Evaluation, were more likely to engage in risk-taking behaviors (e.g. smoking, having unprotected sex; Popham, Kennison & Bradley, 2011).

The impact of stereotypical views on older adults has been well established in the literature, affecting cognitive, health and social factors (for a comprehensive review see, Lamont et al., 2015; Dionigi, 2015). Stereotypical views increase an individual's stereotype threat (Steele & Aronson, 1995) — risk of possibly conforming to the stereotype—and can influence performance on cognitive tasks. For example, older adults demonstrate reductions in source memory performance (Wong, Gallo & Knight, 2018) and decreased use of encoding strategies such as repetition and imagery (Lemaire, Brun & Regner, 2018) when exposed to age specific stereotypes. A meta-analysis confirmed these findings, noting that cognitive performance was affected when older adults were exposed to stereotype-based manipulations with a small to medium effect size ($d = .28$) (Lamont et al., 2015).

Health factors are also affected by stereotypical views in aging adults. Studies have shown that older adults with more negative views of self-aging have an increase in cardiovascular accidents (Levy, Hausdorff, Hencke & Wei, 2000), and mortality (Levy, Slade, Kunkel & Kasl, 2002). Further, there is evidence of a relation between shorter telomere length (an indicator of accelerated cellular aging) and negative age stereotypes among two cohorts of older adults after adjusting for covariates (i.e., sociodemographic, physical and mental health indicators; Pietrazak et al., 2016).

Stereotypical views also impact older adults' emotional and social wellbeing. For instance, a common age stereotype is that people become lonely as they age, and there is evidence that those who agree with this stereotype are more likely to report loneliness in the future (Pikhartova, Bowling & Victor, 2015). Further, as a strategy for combating ageist stereotypes, a person may engage in behaviors that are considered to fit with the self-presentational theory. This theory states that people strive to present a positive view of themselves to others (Leary & Kowalski, 1990), and may disengage from situations to help preserve their image (Richeson & Shelton, 2006).

Intergenerational Interactions

One method to foster better understanding between young and older adults is through intergenerational programs. Promoting intergenerational interactions is consistent with Intergroup Contact Theory (Allport, 1954), which states that prejudice views can be decreased through contact between different groups. By increased contact and learning between two groups, there can be a reduction in negative views, conflict and prejudice. There are many benefits to be gained from intergenerational interactions at the individual, community and society levels. Programs that place older adults in positions as mentors and tutors for underrepresented children and adolescents have found that these engagements improved children's perceptions of older adults, a change that persisted across a period of five to nine years (Gualano et al., 2018). Social and emotional benefits have also been seen in adolescent males following an intergenerational mentoring project in Australia (Cordier et al., 2016; Wilson et al., 2017). Service learning programs, which are designed to provide mutually beneficial interactions for the community and student, have demonstrated a qualitative benefit for the younger generation. Specifically, students

reported seeking out relationships with older adults, who served as role models, leading to increased personal development in the students (Heo, King, Lee, Kim, & Ni, 2013). Other studies have similarly demonstrated that these intergenerational interactions lead to changes in attitudes and perceptions of older adults, and increases in personal growth in young people (e.g., Gutheil, Chernesky, & Sherratt, 2006).

Theoretical Support for Intergenerational Intervention. There are many different theories that have attempted to provide an explanation for the efficacy of intergenerational interactions. Allport (1954) proposed that there are four requirements to reduce prejudice among two groups that are in contact, which include: (1) maintaining equal status in a context, (2) working towards common goals, (3) developing cooperation between groups, and (4) having outside support. Although Allport's Intergroup Contact Theory provides knowledge about the factors that are most likely to produce change, Pettigrew (1998) criticized the theory because it does not tell us much about the processes of change. He proposed that there are four main processes involved in changing views about other groups: (1) learning about different groups, (2) changing behavior, (3) developing a positive emotional connection, and (4) gaining insight about in-groups and out-groups (Pettigrew, 1998).

Incorporating the above guidelines, theories have focused on how to ensure that intergenerational interactions provide benefits for the individual and the group within a particular context. For example, adhering to Pettigrew's theoretical tenets, the environment should remain positive. This could be achieved by developing a program that promotes relationships as in Social Capital (Bostrom, 2003, 2009; Coleman, 1988) and Situated Learning Theory (Lave & Wenger, 1991). Both of these theories support

groups working together towards a common goal for the benefit of the community. However, Social Capital Theory emphasizes the importance of developing an infrastructure in the community that then supports intergenerational engagement in addition to intergenerational program training and programming (Jarrot et al., 2011). Situated Learning Theory is distinct in its effort to explain the process of learning in a socially structured environment in order to gain mastery in a particular skill (e.g., working as an apprentice). Although this theory is different from others suggesting that fostering relationships between two outgroups requires the maintenance of equal status, an intergenerational program based on the Situated Learning Theory (Peterat & Mayersmith, 2006) nevertheless found that both groups (i.e., retired community farmers and middle school students) evidenced mutual learning. One possible reason for this finding may be that the researchers intentionally did not instruct the community farmers or the students on the goals of each meeting, allowing for both groups to develop their own autonomy in this experience.

Individual development is also a common focus among intergenerational interaction theories. The Human Development Theory states that both young and older adults benefit from these forms of interactions, because they encourage older people to remain active and social, while also providing developmental benefits for the young, consistent with Erikson's stages of psychosocial development. Also, Generativity Theory (Erikson, 1959) states that intergenerational interactions provide older adults an opportunity to pass along wisdom (Kuehne and Melville, 2014). Other theories also recognize the benefit of sharing knowledge between groups (i.e., Relational Theory—

sharing of life stories or knowledge), which fosters the development of a connection between individuals and also develops empathy (Portman, Bartlett and Carlson, 2010).

Although there are several theories that may account for the benefits of these forms of interactions, there continue to be many programs without any theoretical framework (Kuehne and Melville, 2014). Jarrott (2011) reported that theory was not explicitly stated in 26% of studies reviewed, 39% did not report any theory, and only 35% reported a theoretical framework.

Assessing Intergenerational Programs. Although intergenerational programs appear to provide important benefits, methods and measures for assessing the efficacy of these interactions have been inconsistent and largely subjective. Data collection for these programs has usually involved gathering responses via interview or questionnaires following an activity. Although gathering this information is helpful in understanding the perceptions of the individuals involved in the activity, failing to gather data prior to the intergenerational activity limits the ability to understand whether programs are effective in changing perceptions, stereotypical views or other factors. Unclear hypotheses, outcomes and procedures limit knowledge about the efficacy of the interventions and the extent to which benefits might generalize to the public (Kuehne, 2003). Therefore, developing a systematic method for collecting data pre- and post- intervention will help further our understanding of the effectiveness of these programs.

Another concern about the assessment of intergenerational programs is that they have largely been evaluated using qualitative methods (Kuehne, 2003), with 67% of studies using these methods in 2000-2007 compared to 46% of articles submitted in the 1990's (Jarrot, 2011). Although qualitative methods are useful in providing knowledge

about the naturalistic responses from intergenerational participants especially when a standardized measure is not available, there has been a recent increase in the development of more quantitative measures to evaluate the benefits of these interactions. Therefore, future studies using a mixed methods approach to validate these measures would further strengthen the field (Jarrot, 2011).

Intergenerational Interactions and College Students. Developing interventions to educate college students about aging and to reduce aging stereotypes has the potential to provide societal and individual benefits. With a growing aging population, it is expected that students will have more interactions with older adults in a variety of careers (e.g., medicine, psychology, nutrition, law etc.) and therefore, providing students with opportunities to learn about aging may better prepare them for a career working with diverse older adults. Few studies have evaluated the benefit of intergenerational interactions between college students and older adults using a variety of programs.

Intergenerational programs have been designed to bring both generations together through theater production (Hill et al., 2018), oral history projects (Ligon, Ehlman, MOriello & Welleford, 2009), and fitness-based programs (Powers, Gray & Garver, 2013). These programs have found reductions in negative attitudes towards older adults and the aging process (Powers, Gray & Garver, 2013; Hill et al., 2018). A theater production program where students met with older adults to share their life stories and develop a theatrical performance titled “*Once In My Life*” indicated the benefit of story-sharing between generations (Hill et al., 2018). Although this latter project was undeniably important for both groups, the authors did not assess the project using qualitative or quantitative methods.

A recent meta-analysis reviewed programs and identified three intervention designs for intergenerational programs: (1) education on aging, (2) intergenerational interactions, and (3) a combination of education about aging and intergenerational contact (Burnes et al., 2019). The results indicated that programs using both education and contact resulted in the strongest effect towards reducing negative aging views. Of note, the reviewed projects were considered to be low cost, which would make it both economical and beneficial to conduct programs that provide education and opportunities for older and younger generations to interact.

Benefits of Intergenerational Interactions. Benefits of intergenerational programs have been well established for young children and adolescents as a function of mentoring and educational support programs (Molpeceres, 2012; Brady, Dolan & Canavan, 2017; Gualano et al., 2018) and for young adults in college settings. Outcomes have primarily focused on whether these interactions influence stereotypical views towards older adults including attitudes and anxiety about aging. Building on Allport's Intergroup Contact Theory, many studies have investigated how contact between generations may influence views towards older adults, and have found that the quality of contact is a stronger predictor of attitudes among college students compared to quantity of contact (Knox, Gekoski and Johnson, 1986; Schwartz and Simmons, 2001). Therefore, an emphasis on developing positive connections and working towards common goals when implementing these forms of interactions is important. Communication between young and older adults is also affected by aging stereotypes as younger generations may engage in disparaging communication styles based on stereotypical views (i.e., over-accommodation speech), resulting in poor conversations (Giles et al., 2003). Further,

undergraduate students have often reported high levels of respect for older adults, but also high levels of avoidance of both middle aged and older adults (Giles, Hajek, Stoitsova, & Choi, 2010). Intergenerational interventions thereby address this disparity between young adults' high regard and high avoidance of older adults.

Theoretical underpinnings of these findings allow for multiple hypotheses about the benefits of intergenerational programs. First, mentoring programs allow for older adults to provide reading, educational, and social support to children in their community, which allows them to pass down their wisdom (i.e., generativity). It also provides them with a sense of purpose or place in the community following retirement (Gualano, 2018). Specific opportunities to share life stories allow older adults to share with others their experiences and perceptions of the past. While this activity is consistent with theories of human development (i.e., Erikson's Theory of Development), it also resembles the process of reminiscence therapy, which engages an individual in remembering past memories (Butler, 1963, 1974). Reminiscence therapy has been found to benefit older adults by improving mood (O'Leary & Barry, 1998; Chin, 2007; Hseih & Wang, 2003), life satisfaction and emotional well-being (Bohlmeijer, Roemer, Cuijpers & Smit, 2007), and cognition (Asiret & Kapucu, 2016; Pinquart & Forstmeier, 2012; Woods et al., 2009). Although engaging in a life review or reminiscing about the past is beneficial, the mechanisms underlying the benefit are less well understood. It is possible that the simple act of engaging socially with others confers benefits (Hsu & Wang, 2009).

Statement of the Problem

Older adults (60+) are at a greater risk for social isolation, and so finding ways to reduce social isolation and increase engagement may provide helpful benefits for older adult populations.

Negative views and behaviors towards aging have been widely studied to assess how they might impact older adults. Stereotypical views towards aging can have a negative influence on older people's performance on tests of cognition, and the extent to which they engage in social and community activities. Further, negative views among older adults have been linked to increased health problems and increased mortality (Levy, Zonderman, Slade & Ferrucci, 2009). Negative stereotypes also impact the level of healthcare that older adults receive (Nemmers, 2005). Many factors may determine how people develop these views towards aging: For example, experiencing the challenges of caring for an older family member with significant health or cognitive impairments may lead a person to have a more negative view towards aging. Similarly, having limited to no contact with older adults may also influence a person's view of aging.

The present study fostered intergenerational interactions between students enrolled in the Adult Development and Aging course at the University of Arizona, and older adults in assisted and independent living facilities in Tucson, AZ. Multiple theories (e.g., Intergroup Contact Theory, Human Development Theory) support the use of intergenerational programs to help older adults remain active and engaged, and to reduce stereotypical views about aging among younger adults. However, understanding how these programs promote beneficial change among these groups is less well understood. The lack of theory-driven programs, insufficient documentation of procedures and methods, lack of objective measurement of benefits in both groups (i.e., young and old),

and the use of primarily qualitative methods has limited our understanding of the mechanisms involved in intergenerational interactions.

We aim to clarify the impact that intergenerational, social interactions have on both older and younger adults. For the younger adults, we are interested in evaluating the effects of intergenerational interactions on anxiety and attitudes toward aging, anxiety about interacting with older adults, and quality of communication with older adults. Additionally, we will investigate whether intergenerational interaction led to significantly increased openness to geriatric careers. For the older adults, we are interested in evaluating how social engagement may provide cognitive and social benefits.

Young Adult Aims. Although the literature supports a benefit of intergenerational interactions for young adults in changing anxiety and attitudes towards older adults, the mechanisms are less well understood due to the lack of theory reported in the literature and the limited use of mixed methods designs. This study aimed to determine whether a brief intervention (4 visits with an older adult) would influence younger adults' views and anxiety about aging, their skills and comfort in communicating with older adults, and intergroup anxiety. The following specific hypotheses were tested:

1. Pre- and post- measures of attitudes towards aging, anxiety about aging, communication skills with older adults, and intergroup anxiety will show a statistically significant improvement following the course and intervention.
2. In order to address the gap in the literature with regard to understanding the connection between qualitative and quantitative methods, the association between the qualitative written responses about students' views towards older adults and the

- quantitative data from the anxiety and attitude questionnaires will be evaluated to better understand their views of the interactions.
3. Student's anonymous responses to questions about the value of the course in relation to their future career goals and engagement with older adults will demonstrate the benefits of the engagement experience.

Older Adult Aims. Remaining socially engaged provides cognitive and mental health benefits, and interventions aimed at increasing social engagement appear to have promising benefits. Therefore, the present study will evaluate the effect of a brief social intervention (4 meetings) on performance on cognitive tasks and self-report measures of mood and well-being, which will be administered pre- and post-intervention. The following additional hypotheses were tested:

1. Consistent with prior studies, measures of executive functions may show improvement following the meetings with the young adults. However, given how brief the intervention period is, it is possible that a benefit in executive functions may not be observed.
2. Participants will show significantly reduced scores on measures of depression and loneliness.
3. Older adults will express a benefit of this intervention through their written responses, as evaluated by themes using qualitative descriptive methods.

Chapter 2. Methods

Participants

Young Adults. Thirty-seven young adult undergraduate ($n = 35$) and graduate students ($n = 2$), over 18 years of age, who were attending the University of Arizona, and enrolled in Psychology 459, the Adult Development and Aging engagement course, participated in this study for course credit. Nineteen took part in Spring 2018 and eighteen took part in Spring 2019. As part of the course, each student was paired with another student (or in one case with two other students) and met with three older adults individually, from independent, assisted and community living environments in Tucson, AZ, to engage them in conversation and learn about their life stories. The students then composed a written document about each older adult's life story and prepared it in book form to give back as a token of appreciation. Demographic characteristics of the young adults are shown in Table 1.

Table 1

Demographic Characteristics for Young Adults

Age $M (SD)$	21.41 (1.95)
Gender % male (n)	29.73 % (11)
Years of Education $M (SD)$	15.41 (1.09)
Ethnicity	
Caucasian	21 (57%)
Hispanic	10 (27%)
Asian American	5 (13%)
African American/Black	1 (3%)

Older Adults. Ninety-two older adults were recruited from independent and assisted living communities in Tucson, AZ as well as from the Aging and Cognition Laboratory participant database. Independent and assisted living locations were first contacted via phone, email or in person to inform directors and social coordinators of the current study. Permission was granted by the following sites, each of which could accommodate twenty students for the experimental intervention: a private facility owned and operated by Watermark, The Fountains at La Cholla, providing independent and assisted living; Sentinel Plaza and Council House, independent living facilities both of which rely on government subsidies and/or low income housing tax credits; St. Luke's Home, low income assisted living housing; Lalo Guerrero Barrio Viejo Elderly Housing, and Casitas on Broadway, two independent living facilities that offer subsidized housing and have populations that are predominately Hispanic. Other locations provided permission for recruitment of the control group: Brookdale Communities (i.e., Brookdale Santa Catalina, Brookdale Tanque Verde, and Brookdale East Tucson), a private management company that provides a range of luxury senior retirement housing, including independent and assisted living; Atria Campana Del Rio, a private facility offering independent and assisted living; Villa Maria Care Center, an assisted living facility; and Broadway Proper, an assisted and independent living setting .

Recruitment. The author and research assistants recruited participants on-site by placing printed fliers on bulletin boards in public places (e.g., lobby, hallways, and front desks), and by scheduling weekly informational meetings for residents to stop by and learn more about the study. Additionally, some sites held weekly meetings (e.g., coffee hour) that this author attended to inform residents of the study and answer questions.

Several sites also held monthly town hall meetings that this author attended to provide residents with a brief introduction to the study. Further, the author conducted presentations on aging topics to sites that were interested, in efforts to inform and recruit participants. Following each of these different types of meetings, the residents were offered fliers with the current study information and the opportunity to sign-up if they were interested in learning more about the project via phone. Each site provided approval of the recruitment efforts made by this author. One site was active in the recruitment process and the social coordinators often informed this writer of potential participants; however, the author informed them of the IRB guidelines restricting this author from contacting potential participants without their approval. Therefore, site staff were informed that residents would be required to express their interest in the study to research staff via phone or in-person.

For recruitment efforts at the Casitas on Broadway and Lalo Guerrero Barrio Viejo Elderly Housing, fliers were translated into Spanish by research assistants who were fluent in both English and Spanish. Research assistants worked together to translate and review the fliers to ensure an accurate translation. In-person recruitment included author and research assistants who were fluent in Spanish in order to inform and answer questions from the residents. Often the director of the sites would accompany the author and research assistants to these meetings to inform the residents of the study and to ensure accurate information was being conveyed. When questions came up, both research assistants and directors would ask the author to clarify any information. Residents who expressed interest and indicated that they were monolingual or bilingual Spanish speakers were always contacted via phone by research assistants who were fluent in Spanish.

Inclusion/Exclusion Criteria and Screening. Participants were screened and excluded for conditions that would affect cognition to the extent that they would be unable to share their life story. Exclusions included, (1) history of neurological disorder such as head injury with loss of consciousness greater than five minutes, stroke, or Alzheimer's disease, (2) significant psychiatric history, (3) history of significant drug or alcohol abuse, and (4) medical conditions that required treatment such as recent/ongoing chemotherapy or radiation. Individuals with neurological disorders (e.g., strokes and Parkinson's disease) were eligible to participate if their performance on cognitive testing did not indicate impairment and they were able to share their life story. Older adult participants were given the Montreal Cognitive Assessment (MOCA) as a brief cognitive screening tool to detect mild cognitive impairment (Nasreddine et al., 2005) in either English or Spanish. A score ≥ 26 is considered within normal limits. However, recent work has recognized that this cutoff score may be too restrictive. For example, Edmonds et al., 2015 reported an increase of false positive in the detection of Mild Cognitive Impairment based on the MOCA cutoff score alone. Other studies (Rossetti et al., 2011) have found that the scores are age and education dependent, such that much lower cutoffs are appropriate for older people and those with less education. Because of the advanced age of many of our participants, we used a very loose criterion (16/30) and considered the MOCA only as a descriptor or indicator of whether an individual could reasonably be expected to complete further testing and share their life story. The Similarities subtest from Wechsler Adult Intelligence Scale- IV (WAIS-IV; Wechsler, 2008a) provided a measure of intellectual functioning. For Spanish speaking participants, the Similarities subtest from Escala de Inteligencia Wechsler para Adultos (EIWA; Green and Martinez,

1967; Taussig, Henderson & Mack, 1992) was administered and age and education corrected scaled scores were calculated. The participants ranged in age from 65-98 ($M = 83.75$, $SD = 8.83$) and had 15.30 ($SD = 3.66$) years of education on average.

Because of the pre-determined time of the psychology course, participants were first recruited and assigned to the social intervention group ($n = 52$) unless they specified a preference to be in the control group. The latter occurred on two occasions when participants reported concern about recalling or sharing their life story and opted to be a part of the control group. Controls were recruited on a rolling basis ($n=40$). There were no significant differences at baseline between the groups on age, gender, education or similarities (Table 2). The groups were significantly different on ethnicity, $\chi^2(3) = 11.65$, $p < .01$ and the MOCA, $F(1, 91) = 6.12$, $p = .02$, with the control group performing better ($M= 24.28$) than the social group ($M= 22.69$).

Table 2.

Demographic Characteristics for Older Adult Participants

	Social <i>n</i> = 52	Control <i>n</i> = 40	Total Sample <i>n</i> =92
Age mean (SD) range	83.00 (9.22) 65-98	84.93 (8.05) 65-97	83.84 (8.74) 65-98
Gender % male (n)	28.8% (15)	20.0% (8)	25.0% (23)
Education %			
Elementary/some high school	11.54%	2.50%	7.60%
High school diploma	19.23%	12.50%	16.30%
Some college	25.00%	25.00%	25.00%
College degree	17.30%	20.00%	20.65%
Graduate degree	26.92%	40.00%	30.44%
Mean number of years	14.82 (4.27) 4-26	15.95 (2.78) 11-21	15.31 (3.72) 4-26
Ethnicity %			
Caucasian	73.10%	97.50%	
Hispanic	23.10%	0%	
Native American	1.90%	0%	
Asian	1.90%	2.50%	
MOCA <i>M</i> (SD)	22.67 (3.34)	24.30 (2.59)	23.38 (3.13)
WAIS-IV Similarities SS (SD)	11.40 (2.37)	11.65 (1.75)	11.52 (2.09)
EIWA Analogias SS (SD)	12.75 (3.30)		

Note: Escala de Inteligencia Wechsler para Adultos (EIWA) Analogias was administered to monolingual and bilingual Spanish speakers. Age and education corrected scaled scores (SS) are reported.

Materials

Young Adults' Self-Report Questionnaires. Self-report questionnaires were administered via Qualtrics in the first class meeting of PSY459 and again in the last class meeting of the semester. To assess perceptions about aging, young adults completed the

Attitudes toward Aging (Lawton, 1975) and the Anxiety about Aging Scale (AAS; Lasher & Faulkender, 1993). The Attitudes Toward Aging is composed of 5-items that ask about the student's view of older adults and the aging process. The AAS is a 20-item questionnaire designed to measure a person's anxiety about the aging process. It contains four subscales to measure a person's view of older adults ("Fear of Older People"), views about emotional well-being with aging ("Psychological Concerns"), physical change concerns with aging ("Physical Appearances"), and fear about loss of friends and support with aging ("Fear of Loss").

We also assessed the frequency and quality of contact with older adults prior to the intervention (Bousfield & Hutchinson, 2010) and measured intergroup anxiety using four questions asking participants to rate their comfortability when interacting with older adults (e.g., I feel awkward around older adults) (Bousfield & Hutchinson, 2010).

Questions about communication style (i.e., over-accommodation, use of humor and sharing of personal information) with older adults were also administered (Chen, Joyce, Harwood, & Xiang, 2016).

Young Adults' Qualitative prompts. Young adults were asked to provide written responses to open-ended questions before and after the intervention regarding their experience interacting with older adults, views of older adults, as well as questions assessing the benefit of the course (i.e., engagement, preparation for a career).

Pre- questions

1. Describe the setting and frequency with which you have had contact with older adults. For example, do you interact with older relatives? If so, how often?
2. What, in your view, is the typical older adult like?

Post-questions

1. Describe the nature of your contact with older adults that you interviewed.
2. Based on your experience with meeting older adults in the community, what did you learn from them that you didn't know before? This could be related to culture or history, or might be a fun fact you didn't already know about.
3. Based on your experience meeting older adults in the community, what did you learn about the aging process that was not learned in class?
4. How well do you think this course has prepared you for a career?
5. How has the engagement experience enabled you to connect with older adults?

Please explain.

Older Adults. The following measures of cognition and self-report questionnaires were administered to older adult participants by both this author and trained research assistants.

Neuropsychological Tests. We administered a brief neuropsychological battery to evaluate cognition pre- and post- intervention. The Controlled Oral Word Association Test (COWAT-FAS; Lezak, 2004) provided a measure of phonemic verbal fluency with the total correct responses as the outcome measure. WMS-III (Wechsler, 1997) and WMS-IV (Wechsler, 2008b) Verbal Paired Associates were administered to assess verbal memory. Alternate versions were administered at Time 1 and Time 2 in a counterbalanced order across participants to eliminate practice effects, and scaled scores were calculated for comparisons between the two versions. Trail Making Test Part A

was administered to assess attention and processing speed and Part B to assess executive function (Reitan & Wolfson, 1985), and time to completion was recorded.

Monolingual and bilingual Spanish speakers. A battery of neuropsychological assessments that were translated and normed for Spanish speaking older adults were administered instead of the battery described above. The following tests were administered: Trails A and B (Taussig, Henderson & Mack, 1992), Verbal Fluency (PMR; i Fortuny, Heaton & Hermsillo, 1998) and semantic fluency (animals; Acevado et al., 2000), and Spanish Verbal Learning Test (i Fortuny et al., 1998).

Additionally, we administered two executive function tests to assess updating and shifting abilities (Alexander et al., 2012).

Keep track. Updating refers to the ability to hold and manipulate or update information in working memory. This task, adapted from Miyake (2000), presented fifteen words from six different categories (distances, metals, relatives, furniture, sports, and fruits) one at a time. Participants were asked to keep in mind the last word presented for each target category listed at the bottom of the computer screen, beginning with one target category and increasing in difficulty to a maximum of four target categories. There were three successive trials at each difficulty level. Following the presentation of words for each trial, participants were then instructed to write down the last word for each of the target categories. The total number of words that could be recalled was 30.

Number letter. Shifting refers to the process of re-directing attention between mental tasks. The Number-Letter task adapted from Miyake (2000), requires that a person flexibly switch between two tasks, responding to either numbers or letters. Participants were shown number-letter pairs (e.g., 6A) in one of the four quadrants of the computer

screen. If the number-letter pair was in one of the top two quadrants, they were to indicate if the number was odd or even. If it was in one of the bottom two quadrants, they were to indicate if the letter was a consonant or a vowel. The task began with two blocks that followed one rule (non-mixed blocks): Indicate whether the number was odd or even (30 trials) followed by a block to indicate whether the letter was a consonant or vowel (30 trials). The last two blocks (60 trials each, mixed blocks) presented the number-letter pairs in a clockwise sequence on the computer screen requiring participants to switch between number (odd or even) and letter (consonant or vowel) responses on every other trial. Response times (RTs) were recorded, and data were pre-processed for each individual to delete incorrect responses, RTs with 200ms or less, and RTs that were 2.5 standard deviations or more away from the mean.

Outcome measures derived from the Number-Letter task are the Global Shift Cost and the Local Shift Cost. The Global Shift Cost was calculated by subtracting the average non-mixed block RTs from the average mixed block RTs. The Local Shift Cost was calculated from the two mixed blocks only. Within these two blocks, the average RTs for the non-switch trials (i.e., responding to the same rule on two consecutive trials) was subtracted from the average RTs for the shift trials (when the rule changed on consecutive trials). The final outcome measure for both global and local shift costs was a ratio score calculated to control for individual differences in overall speed of responding: $((\text{mixed minus non-mixed}) / \text{non-mixed})$. Higher scores indicate worse performance.

Self-Report Questionnaires. Older adults completed several self-report questionnaires to assess well-being and social variables associated with aging. To assess mood, we used the Geriatric Depression Scale (GDS) which is a 30-item scale assessing

for changes in mood that may indicate depression. Cutoff scores of 10-19 indicate mild depression and 20+ indicates severe depression (Parmelee & Katz, 1990). A recommended cutoff of 11 was used for participants of Hispanic ethnicity as this cutoff score is considered to be more sensitive for this population (Espino, Bedolla, Perez & Baker, 1996).

To evaluate perceptions and attitudes towards aging, participants completed the Aging Perceptions Questionnaire (APQ; Barker, O'Hanlon, McGee, Hickey & Conroy, 2007) and the Philadelphia Geriatric Center Morale Scale (PGCM; Liang & Bollen, 1983). The APQ is a validated 32-item questionnaire consisting of seven sub-scales assessing various dimensions of aging perceptions: (1) awareness of aging (timeline chronic), (2) fluctuations of thinking of aging (timeline cyclical), (3) how aging impacts a person positively (positive consequences), (4) how aging results in negative changes (negative consequences), (5) aging's impact on social factors and autonomy (positive control), (6) adaptation to negative changes with aging (negative control), and emotional responses to aging (emotional representations). Higher scores indicate greater endorsement of the specific aging perception. The PGMC has three subscales to assess attitudes towards aging (e.g., "Do things keep getting worse as you get older?"), loneliness (e.g., "Do you see enough of your friends and relatives?") and agitation (e.g., "Do little things bother you more this year?"). Higher scores indicate more positive aging perceptions. Experiences, attitudes and anxiety about aging were measured using the Anxiety about Aging Scale (AAS; Lasher & Faulkender, 1993) with lower scores indicating higher levels of anxiety with aging.

Social support was measured using the UCLA Loneliness Scale (Russel, 1996), Social Network Index (Cohen, Doyle, Skoner, Rabin & Gwaltney, 1997), Lubben Social Network Scale (Lubben & Girona, 2004), MOS Social Support Survey (Sherbourne and Stewart, 1991), and the Social Provisions Scale (Cutrona & Russell, 1987) in both groups. The UCLA Loneliness Scale was given to all participants, and the other four social support measures were given to all of the controls (n = 40) and second cohort of older adults in the social group (n = 26).

The UCLA loneliness scale (UCLA). This 20-item questionnaire was used to measure subjective feelings of loneliness and social isolation (Russel, 1996) on a scale of 1 (never) to 4 (often) with higher scores indicate greater subjective feelings of loneliness.

Lubben social network scale (LSNS). This 12-item questionnaire measures the number of relations and frequency with which a person engages in various social events (i.e., family, friends, education, co-workers, and volunteers) on a Likert scale ranging from 0 (less engagement) to 5 (more engagement). Higher scores indicate greater social engagement (Lubben, 1998).

MOS social support survey (MOS). This 19-item questionnaire measures perceived support in the following domains: emotional and informational support, tangible support, affectionate support, and positive social interactions. The questions are rated on a Likert scale ranging from 1 (None of the time) to 5 (All of the time). Higher scores are indicative of greater social support (Sherbourne and Stewart, 1991).

The social provisions scale (SPS). This measure evaluates a person's perceived ratings of various aspects of social support that they may receive from their relationships: attachment, social integration, reassurance of worth, reliable alliance, guidance, and

opportunity for nurturance. This questionnaire is composed of 24-items with 4 items assessing each of the domains of social support listed above using a 4-point Likert scale with greater scores indicating greater perceived social support in their relationships (Cutrona and Russell, 1987).

Social network index (SNI). This 24-item questionnaire measures the number of relations and frequency with which a person engages in various social events (i.e., family, friends, education, co-workers, and volunteers). Higher scores indicate greater support.

Qualitative Prompts. Prior to the intervention, participants in the social group were asked to provide information about the frequency and nature of their interactions with young adults, and the traits they feel describe younger adults using open-ended questions as follows

1. Describe the nature of your contact with younger adults?
2. What are traits that describe younger adults?

Following the intervention, participants in the social group provided responses to questions about the interaction. To improve data collection for the second cohort, the questions were modified slightly (see below) and researchers recorded participants' responses.

1. Did you feel that your interaction with the young people was meaningful? Did you feel a connection?
2. What did you enjoy about the experience? (modified from "Did you enjoy the experience")

Procedure

Pre-Intervention.

Young Adults. During the initial class meeting for PSYC 459, a graduate student not involved in the research project nor in the course evaluation provided students with information about the nature of the research and explained the consent form. Students provided informed consent in accordance with procedures approved by the University of Arizona Institutional Review Board. Each student was assigned a number to use while they completed the pre- and post-questionnaires via Qualtrics to ensure that their responses were anonymous and would have no impact on their evaluations during the course. The consents and assigned numbers were held by the graduate student not involved in the course until grades were submitted each semester.

Prior to visiting older adults in the community, students in the Spring 2018 cohort completed Elder Communication Training provided by the Arizona Center on Aging through the Geriatric Workforce Enhancement Program. Because of scheduling conflicts, the Spring 2019 cohort was unable to take part in this training. However, students were provided with similar information by the course instructor in preparation for their interviews. The forty-minute training included experiential education on geriatric issues (e.g., sensory changes) and how to address such issues. Additionally, the training focused on developing empathy towards aging populations.

Older Adults. Research personnel met with older adults for an initial testing session that took place in older adult participants' homes and lasted approximately 1.5 -2 hours. During this session, they provided informed consent including consent to have the interviews recorded, completed cognitive and depression screening assessments (i.e., the MOCA and GDS), and the following cognitive assessments: Similarities, Verbal Paired Associates, Trails A & B, Number Letter, Controlled Oral Word Association Test , and

Keep Track. Attempts were made to have the self-report questionnaires completed in the same session; however, because of fatigue and time, participants opted for research staff to pick up the questionnaires at a later time. Follow-up meetings were scheduled if the participant expressed feeling fatigued or was unable to complete the cognitive testing in one session for personal reasons.

Intervention.

During the intervention period, two or three students were paired with one older adult from each of three different locations in Tucson, AZ. As noted above, locations included The Fountains at La Cholla, Sentinel Plaza, Council House, St. Luke's Home, Lalo Guerrero Barrio Viejo and the Casitas on Broadway. Students met with each older adult for three consecutive weeks in order to obtain their life story. These weekly meetings lasted approximately 45-60 minutes.

Initial Meeting. Students were instructed to begin the session by introducing themselves and stating the purpose for these meetings (i.e., gathering the older adult's life story). They were told to ask the older adults to include as much detail as they would like, and they informed the older people that the conversations were being recorded. Students were instructed to then initiate the conversation with the prompt, "Tell us about yourself," to allow the older adults the opportunity to choose where they would like to begin when sharing their life story. The students did not receive much additional information about how to conduct the interview. With ten minutes left in the session, the students wrapped up the conversation and reminded the older adults of the time and date of their next meeting.

Second and Third Meeting. For the next two meetings, the students developed more specific questions to guide their meetings after summarizing the first meeting (e.g. clarify dates or names). They began the sessions by exchanging greetings and provided a brief summary of the previous interview.

Book Presentation Meeting. At the end of the semester, all of the students and older adults met together as a group at each of the sites, and the students presented the books to their older adult partner.

Post-Intervention.

Young Adults. At the end of the semester, students completed the following questionnaires that they had filled out prior to the intervention: Anxiety about Aging, Attitudes Toward Aging, intergroup anxiety, and communication skills. They provided responses to open-ended questions asking about their experience with the older adults. The class was debriefed on the purpose of the research project and questions were answered.

Older Adults. Following the three visits from the students, older adults met with research personnel for a post-testing session. During this session, they completed the depression screening (the GDS) and the same cognitive assessments that they had completed prior to the intervention: Verbal paired associates, Trails A & B, Number Letter, Controlled Oral Word Association Test, and Keep Track. Then participants completed the same questionnaires that they had completed earlier, APQ, PGCM, AAS, UCLA Loneliness Scale, as well as some short questions about the experience. Testing was completed at the participant's residence.

Control Group. We attempted to recruit older adults from the same assisted and independent living communities as the social group. However, because of limited interest, the majority of the participants in the control group were living at Atria del Campana, Brookdale and The Fountains. Initial testing sessions for the controls were held in the same way as the social group. Thus, testing was completed in older adults' homes, and people provided informed consent followed by cognitive testing and completion of the self-report measures. Controls were contacted 7-8 weeks later to complete the second session of testing. They did not participate in the intervention with the young adults.

Qualitative Data Analyses

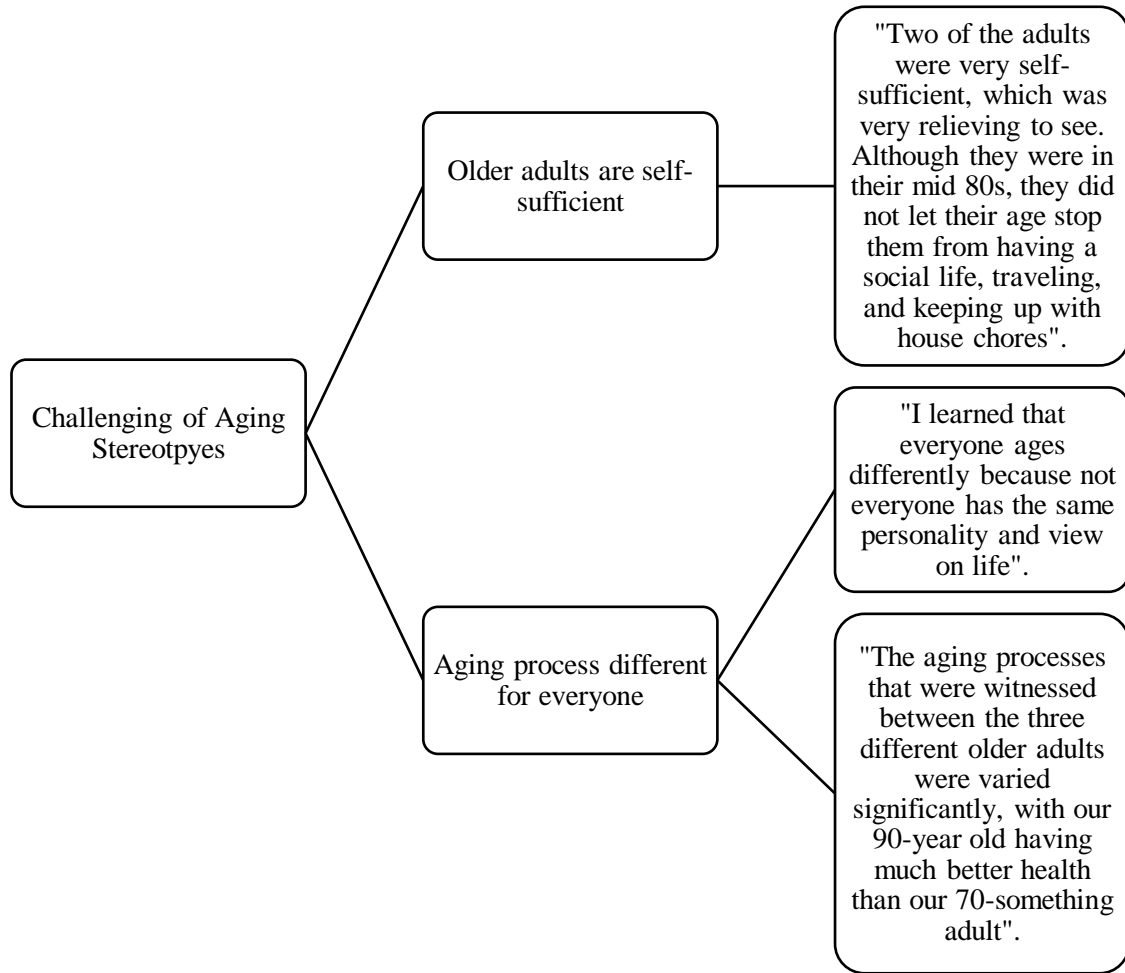
Responses to open-ended prompts were either written down by participants or audio recorded at the pre- and post-data collection sessions. Those that were audio-recorded were transcribed and reviewed for accuracy. All responses were compiled together into an Excel document, and this file was reviewed against the transcribed and written responses for accuracy. Audio files of interviews and recorded responses were transferred from the recorder to a secured back-up drive.

In an effort to understand the young and older participants' views of their brief interactions, we utilized a qualitative descriptive methodology that allows for analysis of the data at the surface level with less interpretation of the meaning of the data (Sandelowski, 2000; Neergaard, Olesen, Andersen & Sondergaard, 2008). This methodology is not constrained by theoretical frameworks, so that the data can be analyzed for its factual meaning. Qualitative content analysis is a particular form of descriptive methodology that allows for the development of thematic codes that describe

the raw data (Sandelowski, 2000). We utilized open coding to derive meaningful categories (Elo & Kyngas, 2008) as an inductive method to allow the data to inform us of the factors evident in the interactions. Data analysis was completed following data collection.

This author and a research assistant read through the transcripts multiple times and independently identified codes for each of the individual questions for both the young and older adults, which were derived from the exact words of the participants (see Figure 1). Due to the structure of the prompts, it was clear that both groups of participants utilized the same or similar words in their responses. Therefore, identified codes were similar to the question prompts and were initially defined for each question. Individual responses usually contained information for more than one code and were counted for each appropriate code. Following the initial reading, the raters discussed the thematic codes and impressions of the interactions to further develop a codebook. The initial codes were modified and further reduced to fit into broader overarching themes. The coded data were reviewed and codes that were similar and shared among participants and across questions were then collapsed into a single code to avoid redundancy. Participants' transcripts were then re-read to determine the extent to which their responses fit into each of the broad thematic coding categories. The percentage of participants from each group whose responses included each of the themes was noted, as well as the number of times each participant mentioned the theme.

Figure 1. Example of Coding Qualitative Data to Primary Themes



Chapter 3. Results

Young Adult Participants

Young adult participants were 37 undergraduate and graduate students who enrolled in PSY459 over the course of two Spring semesters (2018 and 2019). One undergraduate student dropped out of the course after completing the pre-questionnaires, and therefore this person's data were excluded from analyses. Comparisons between cohorts of young adults revealed significant differences on their views of the Psychological Concerns subscale of the AAS, $t(35) = 2.08$, with the 2018 cohort endorsing greater psychological concerns ($M = 11.00$) compared to the 2019 cohort ($M = 9.11$). There were no other differences indicated between cohorts on any of the other measures.

Table 3 presents the young adult data from the Anxiety about Aging questionnaire.

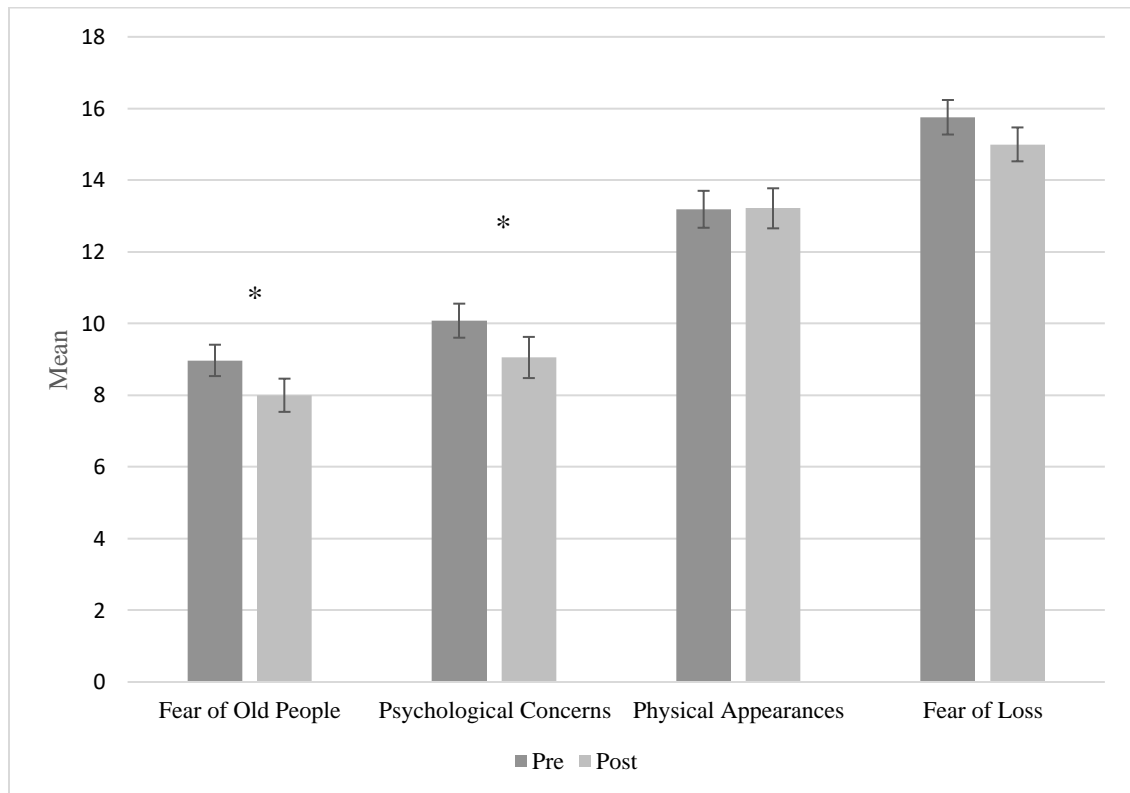
Table 3. Young Adults' Anxiety about Aging Scores

	M (SD)	
	Time 1	Time 2
AAS Total	48.00 (7.46)	45.27 (9.03)*
Fear of Old People Factor	8.97(2.66)	8.00 (2.81) *
Psychological Concerns Factor	10.08 (2.89)	9.05 (3.49) *
Physical Appearance Factor	13.19 (3.13)	13.21 (3.40)
Fear of Loss Factor	15.75 (2.93)	15.00 (2.88)

*Note: Total scores are out of 100 where subscale scores are out of 25. Higher scores represent greater endorsement of aging anxiety. * $p < .05$*

Paired samples t-tests were conducted to assess differences between pre- and post- measures of anxiety about aging among the young adults. Overall (i.e., AAS Total) results showed a decrease in anxiety about aging following the intervention, $t(36) = 2.59$, $p = .014$, $d = .35$. On the specific subscales (see Figure 2), students demonstrated significantly less fear of older adults, $t(36) = 2.42$, $p = .021$, $d = .35$, and fewer concerns about psychological problems in aging, $t(36) = 2.29$, $p = .028$, $d = .34$. The pre- and post-scores were not significantly different for anxiety related to physical appearance changes with aging, $t(36) = .056$, $p = .956$, $d = .02$, or for fear of losing social support and autonomy with aging (i.e., fear of loss), $t(36) = 1.58$, $p = .122$, $d = .25$.

Figure 2. Young Adults' Anxiety about Aging Subscale Results



Note: Subscale scores are out of 25. Higher scores represent greater endorsement of aging anxiety. * $p < .05$

There was also an increase in positive perceptions of aging following the intervention on the Attitudes toward Aging questionnaire, $t(36) = 5.88, p = .000, d = 1.18$ (see Table 4).

Table 4. Young Adults' Attitudes toward Aging

	M (SD)	
	Time 1	Time 2
Attitudes Towards Aging Total	2.78 (1.31)	4.14 (.98) *

Note: Higher scores represent greater positive attitudes towards aging. Range of possible scores are 0-5.

The Intergroup Anxiety Questionnaire revealed a significant decrease in intergroup anxiety in young adults following the intervention, $t(36) = 2.13, p = .040, d = .49$ (see Table 5).

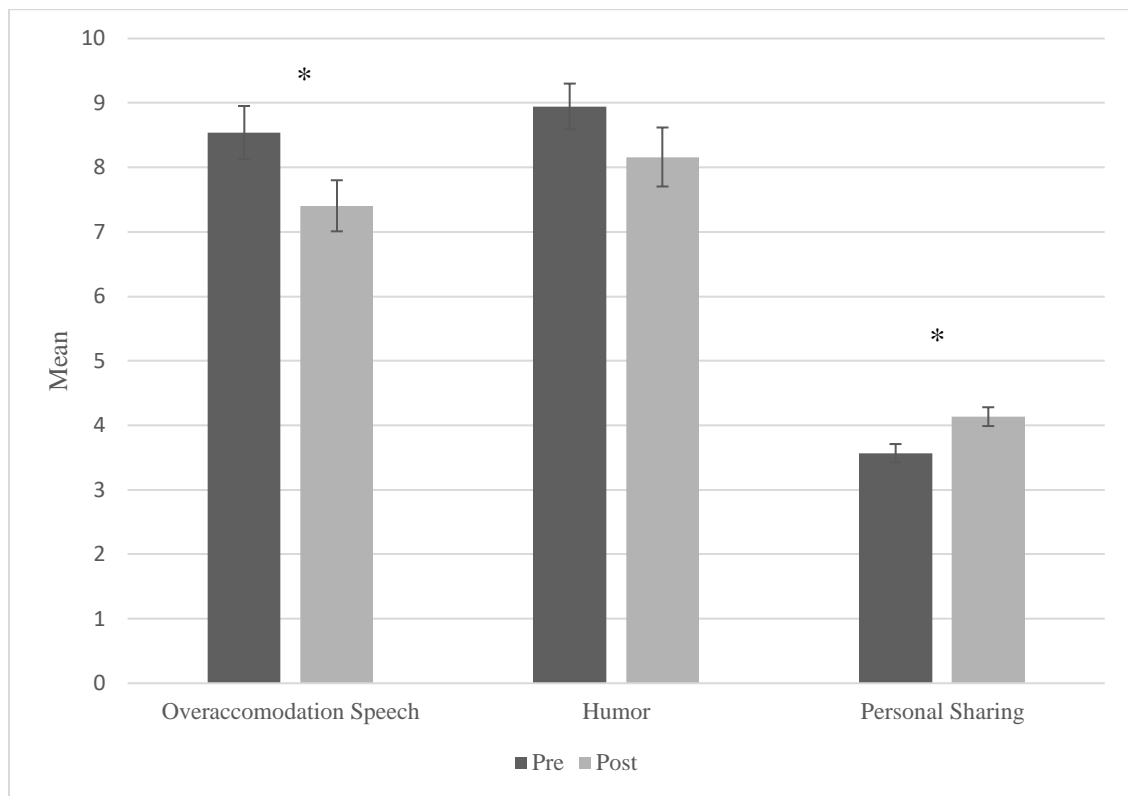
Table 5. Young Adults' Intergroup Anxiety Scores

	M (SD)	
	Time 1	Time 2
Intergroup Anxiety Total	9.21 (2.64)	8.14 (2.39) *

Note: Higher scores represent greater intergroup anxiety.

The intervention also resulted in significantly decreased use of over-accommodation speech, $t(36) = 2.61, p = .013, d = .50$, and a significant increase in sharing of personal information, $t(36) = 2.96, p = .005, d = .68$ (see Figure 3). Young adults also showed a decrease in the use of humor in conversations, although the difference was not significant $t(36) = 1.88, p = .069, d = .38$.

Figure 3. Young Adults' Communication Results



Note: Higher scores indicate greater use of communication style. * $p < .05$

Older Adult Participants

Preliminary and Descriptive Analyses. Older adult participants were 92 adults recruited from various assisted and independent living communities in Tucson, AZ (see Table 6). Data are missing for all measures for a variety of reasons, including health problems that caused a person to drop-out of the study or not complete the post-measures, worsening eyesight and hearing, refusal to complete measures due to fatigue and or frustration, and discontinuation of tasks due to a person's performance. Additional social

measures were added for the second round of data collection, and therefore are missing from the first group of older adults who completed the intervention.

Participants from different living environments differed on a number of demographic variables. With regard to age among those in the social group, people from The Fountains were significantly older than those from Council House, Sentinel Plaza, Casitas, Barrio Viejo, and the community, p 's < .05. Similarly, participants from St. Luke's were significantly older than those from Council House, Sentinel Plaza, Casitas and Barrio Viejo, p 's < .05. In the control group, participants from The Fountains, St. Luke's and Atria were significantly older than those from Covenant House, p 's < .05. Participants from Brookdale were younger than those from The Fountains and Atria, although these differences didn't reach significance (Fountains vs. Brookdale, $p = .09$; Atria vs. Brookdale, $p = .08$).

Participants in the social group significantly differed with regard to reported education levels, $F(5, 51) = 3.83, p < .05$. Post-hoc comparisons revealed that participants from Casitas and Barrio Viejo had significantly lower education levels compared to The Fountains ($p < .05$). Participants from Sentinel Plaza and St. Luke's had somewhat higher education levels compared to Casitas and Barrio Viejo; however, these differences did not quite reach significance ($p = .066$ and $p = .069$ respectively).

Across sites participants in the social group performed marginally differently on the MoCA, $F(5, 50) = 2.26, p = .065$. Further comparisons revealed participants from Council House ($M = 26.50$) and Sentinel Plaza ($M = 26.33$) performed better than participants from other sites, however they were also the youngest participants. There were no differences across sites in the control group, $F(4, 39) = 1.64, p = .19$.

Table 6
Demographic Information for Social and Control Participants Across Sites

	Social <i>n</i> = 52	Control <i>n</i> = 40
Age <i>M</i> (<i>SD</i>)		
Fountains	89.19 (4.07)	89.00 (4.62)
Council House	68.70 (3.82)	
St. Luke's	85.13 (8.70)	90.00 (8.66)
Sentinel Plaza	69.00 (3.61)	
Casitas and Barrio Viejo	72.86 (4.26)	
Community	79.40 (7.50)	
Covenant House		70.00 (1.41)
Atria		87.50 (5.16)
Brookdale		80.33 (8.05)
Education <i>M</i> (<i>SD</i>)		
Fountains	16.07 (3.97)	14.43 (2.94)
Council House	18.50 (3.53)	
St. Luke's	14.64 (3.15)	15.33 (1.15)
Sentinel Plaza	14.67 (2.31)	
Casitas and Barrio Viejo	9.43 (4.39)	
Community	16.20 (4.27)	
Covenant House		
Atria		16.44 (2.85)
Brookdale		16.25 (2.86)
MoCA <i>M</i> (<i>SD</i>)		
Fountains	22.55 (3.20)	23.00 (2.58)
Council House	26.50 (3.54)	
St. Luke's	21.43 (3.44)	24.33 (3.79)
Sentinel Plaza	26.33 (2.08)	
Casitas and Barrio Viejo	21.57 (2.82)	
Community	24.40 (2.61)	
Covenant House		26.50 (0.71)
Atria		23.75 (2.44)
Brookdale		25.42 (2.40)

Neuropsychological Data. We analyzed the data using a 2 x 2 mixed ANOVA with group (social and control) as the between-subjects factor and time (Time 1 to Time 2) as the within-subjects factor for all outcome measures unless otherwise specified. We hypothesized that participating in a social intergenerational interaction would have beneficial effects on cognitive functioning and well-being compared to a control group. Thus, the primary measure of interest is the Group x Time interaction demonstrating that there was an effect of the social intervention.

Data were normally distributed unless otherwise noted. Baseline data were compared between groups to determine whether there were any differences. If differences were found, then analyses included Time 1 performance as a covariate. Overall findings were considered significant at $p < .05$. We should also note that because of differentially missing data primarily from the social group, as noted earlier, the sample sizes differ somewhat across tests. These are noted in each Table.

Table 7 shows performance on the Paired Associate Learning task from the WMS.

	Social n= 45		Controls n= 36	
	Time 1	Time 2	Time 1	Time 2
Immediate Recall	11.33 (2.76)	10.80 (3.51)	11.44 (3.51)	11.81 (3.58)
Delayed Recall	11.11 (2.70)	11.27 (3.07)	11.31 (3.41)	11.67 (3.30)

Immediate recall of the verbal paired associates revealed no significant main effect of time, $F(1, 79) = .074, p = .786, \eta_p^2 = .001$, nor a Group \times Time interaction, $F(1, 79) = 2.00, p = .161, \eta_p^2 = .025$. Similarly, results did not demonstrate a significant main effect of time for delayed recall, $F(1, 79) = .836, p = .363, \eta_p^2 = .010$, nor a Group \times Time interaction, $F(1, 79) = .132, p = .717, \eta_p^2 = .002$.

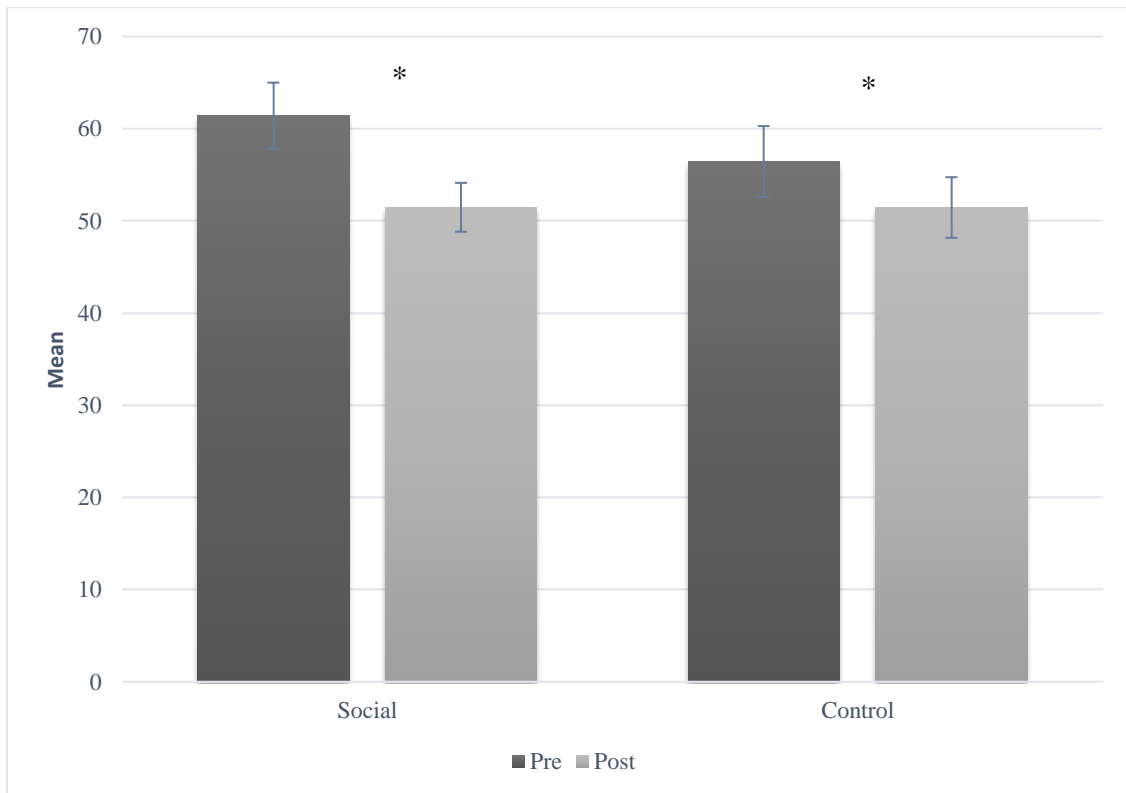
Table 8
Mean and SD of Attention and Executive Function Measures

	Social n= 35		Controls n= 36	
	Time 1	Time 2	Time 1	Time 2
Attention				
Trails A (n = 46, n = 39)	61.42 (24.30)	51.48 (17.99)	56.45 (24.02)	51.45 (20.54)
Executive Functions				
Trails B	175.87 (69.76)	171.92 (82.42)	169.96 (87.84)	165.69 (105.75)
Trails Difference	117.17 (62.05)	122.74 (75.62)	114.60 (77.40)	113.55 (99.93)
Trails Ratio	2.17 (1.37)	2.66 (2.18)	2.14 (1.30)	2.30 (2.15)
FAS (n = 47, n = 40)	34.96 (12.83)	36.57 (12.34)	40.58 (10.18)	38.92 (10.64)
FAS Scaled Scores	9.36 (3.53)	9.64 (3.33)	10.50 (2.71)	10.10 (2.78)

Note: Sample sizes are indicated at the top of the table for each group with the exception of Trails A and FAS that had data for more participants indicated in the parentheses.

Results for the attention and executive function measures are shown in Table 8. Means of completion times, differences between Trails A and Trails B, and ratio scores $((B-A)/A)$ were calculated. With regard to attention (see Figure 4), there was a significant effect of Time, $F(1, 83) = 14.77, p = .001, \eta_p^2 = .126$; both groups performed faster at Time 2 compared to Time 1. However, the Group \times Time interaction was not significant, $F(1, 83) = 1.55, p = .255, \eta_p^2 = .016$.

Figure 4. Older Adults' Mean Time to Completion for Trails A



Note: Completion times are in seconds and lower scores indicate faster performance.

* $p < .05$

For Trails B, there was no significant main effect of time, $F(1, 69) = .169, p = .682, \eta_p^2 = .002$, nor was there a statistically significant interaction between time and group, $F(1, 69) = .000, p = .988, \eta_p^2 = .000$. No significant main effects or interactions were detected between groups for Trails difference scores, $F(1, 69) = .049, p = .825, \eta_p^2 = .001$, and $F(1, 69) = .106, p = .746, \eta_p^2 = .002$ respectively, or Trails ratio scores, $F(1, 69) = 1.532, p = .220, \eta_p^2 = .022$, and $F(1, 69) = .381, p = .539, \eta_p^2 = .005$ respectively. Groups were not significantly different at baseline, $F(1, 83) = .894, p = .347$, for Trails A or Trails B, $F(1, 69) = .098, p = .755$.

Scaled scores were calculated using normative data accounting for education and ethnic differences for verbal fluency. ANOVA results indicated there was no significant main effect of time, $F(1, 85) = .105, p = .747, \eta_p^2 = .001$. The Group x Time interaction demonstrated a trend towards being statistically significant, $F(1, 85) = 3.15, p = .080, \eta_p^2 = .036$, such that the control group demonstrated a decline ($M = -.40$) and the social group improved over time ($M = .28$).

Executive function measures are shown in Table 9.

Table 9
Mean and SD of Executive Functions Measures

	Social n= 31	Controls n= 28
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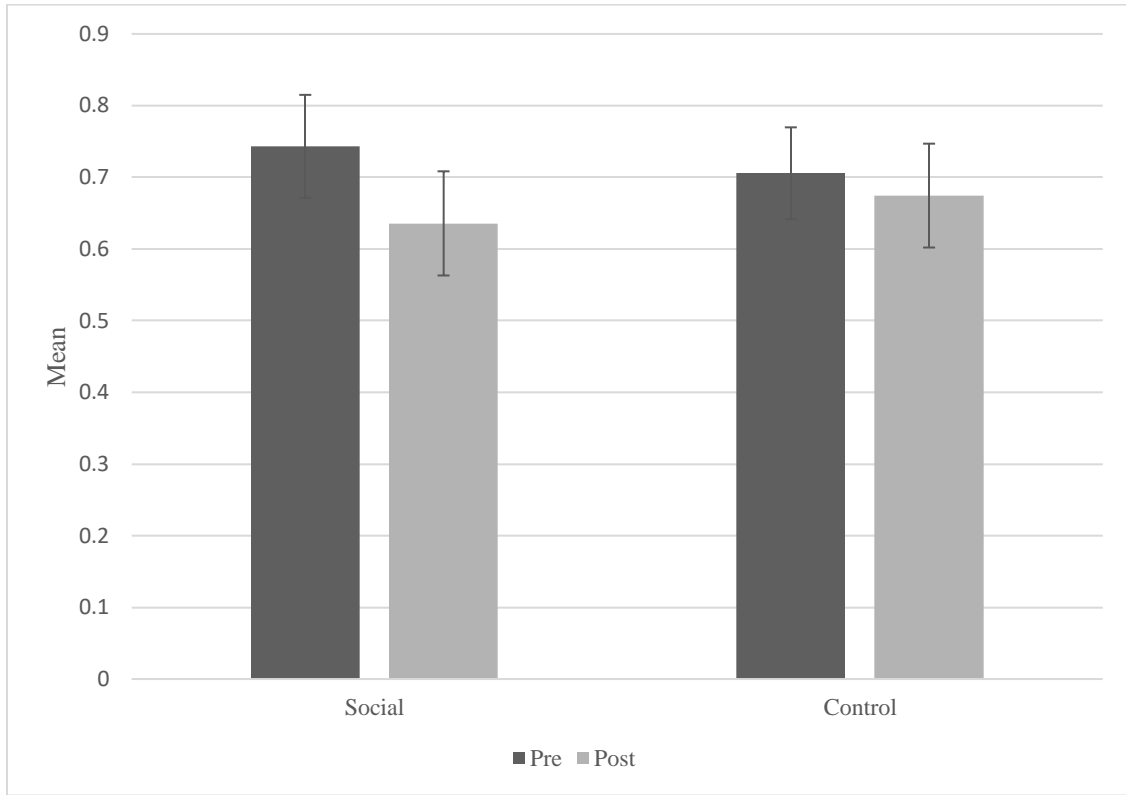
	Time 1	Time 2	Time 1	Time 2
Updating				
Keep Track (n = 36, n = 35)	14.71 (4.04)	14.68 (4.46)	15.75 (4.74)	16.50 (4.85)
Shifting				
Number Letter Global	1054.34	827.02	1071.74	940.98
Shift Cost	(663.65)	(551.84)	(621.74)	(620.04)
Global Shift Cost Ratio	.74 (.39)	.63 (.40)	.71 (.35)	.67 (.40)
Number Letter Local Shift	898.48	925.49	872.51	843.20
Cost	(575.96)	(703.11)	(555.10)	(584.00)
Local Shift Cost Ratio	.48 (.27)	.54 (.39)	.49 (.31)	.51 (.35)

Note: Keep Track scores are number correct out of 30. Number Letter individual task scores are in milliseconds. Global shift cost is the difference between performance on a dual-task block and single-task block. Local shift cost is the difference between switch trials and repeat trials within a dual-task block.

With regards to our measure of updating, mean scores presented in Table 9 did not reveal a significant main effect of time, $F(1, 69) = .511, p = .511, \eta_p^2 = .007$, nor was the Group x Time interaction significant, $F(1, 69) = .982, p = .982, \eta_p^2 = .014$.

Ratio scores were analyzed for the shifting task. There was a trend towards a significant main effect of time for the Global Shift Cost Ratio, indicating decreases in the global shift cost over time, $F(1, 57) = 2.84, p = .098, \eta_p^2 = .047$; however, the group by time interaction was not statistically significant, $F(1, 57) = .859, p = .358, \eta_p^2 = .015$ (see Figure 5). There was no significant main effect of time for the Local Shift Cost Ratio, $F(1, 57) = 1.48, p = .228, \eta_p^2 = .025$, nor was the Group x Time interaction significant, $F(1, 57) = .523, p = .472, \eta_p^2 = .010$.

Figure 5. Mean Number Letter Global Shift Cost Ratio



Note: Mean global local shift cost ratios were calculated with higher scores indicating worse performance.

Self-Report Social Variables. On the Geriatric Depression Scale (see Table 10), there was no main effect of time, $F(1, 87) = 1.32, p = .245, \eta_p^2 = .015$, nor was the Group \times Time interaction significant, $F(1, 87) = .041, p = .840, \eta_p^2 = .000$.

Table 10
Mean and SD of Geriatric Depression Scale

Social n= 49		Controls n= 40	
Time 1	Time 2	Time 1	Time 2

Geriatric Depression Scale	6.61 (5.06)	6.24 (4.88)	6.15 (5.06)	5.62 (4.72)
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Note: GDS=Geriatric Depression Scale. Scores of 10-19 indicate mild depression while scores of 20-30 indicate severe depression.

On the UCLA Loneliness Scale (Table 11), mean scores revealed a non-significant trend toward improvement over time, $F(1,68) = 2.98, p = .089, \eta_p^2 = .042$; however, the Group \times Time interaction was not significant, $F(1,68) = 1.69, p = .198, \eta_p^2 = .024$.

Table 11
Mean and SD of UCLA Loneliness Scale

	Social n= 34		Controls n= 36	
	Time 1	Time 2	Time 1	Time 2
UCLA Loneliness Scale	40.00 (11.92)	39.71 (11.01)	38.76 (10.42)	36.67 (11.12)

Note: Scores can range from 20 (less lonely) to 80 (lonely).

Social support scores are shown in Table 12.

Table 12
Mean and SD of Social Support

	Social n= 17		Controls n= 27	
	Time 1	Time 2	Time 1	Time 2
Social Network Index (SNI)				
High Contact Roles	3.59 (1.77)	2.88 (1.41)	4.48 (2.04)	4.78 (2.11)

Number of People in Social Network	11.00 (7.69)	8.41 (7.48)	12.93 (8.01)	15.93 (12.63)
Lubben Social Network Scale (LSNS)	25.56 (14.48)	27.59 (13.52)	30.78 (10.86)	31.48 (11.54)
MOS Survey Total (MOS)	54.94 (20.75)	56.05 (21.70)	71.78 (19.76)	76.45 (15.98)
Social Provisions Scale (SPS) (n = 14, n = 35)	72.57 (11.28)	72.43 (13.97)	78.37 (12.28)	81.06 (10.10)

Notes: Higher scores indicated greater social support and engagement.

With regards to the Social Network Index, there was no main effect of time, $F(1, 42) = 1.09, p = .301, \eta_p^2 = .025$, however mean scores for SNI High Contact Roles revealed a significant Group x Time interaction, $F(1, 42) = 6.55, p = .014, \eta_p^2 = .135$. Post hoc analyses showed a non-significant trend towards a decrease in means of high contact roles in the social group, $t(16) = 1.95, p = .069, d = .44$, compared to the control group that had no significant change in their social network, $t(26) = 1.39, p = .175, d = .14$.

For Number of People in a Social Network, mean scores revealed no significant main effect of time, $F(1, 42) = .018, p = .893, \eta_p^2 = .000$, nor was there a statistically significant interaction of time and group, $F(1, 42) = 3.52, p = .074, \eta_p^2 = .074$. Similarly, mean scores for the Lubben Social Network Scale revealed no significant main effect of time, $F(1, 42) = 1.73, p = .196, \eta_p^2 = .040$, nor a statistically significant interaction of time and group, $F(1, 42) = .397, p = .532, \eta_p^2 = .009$.

Mean scores for the MOS were significantly different at baseline between groups, $F(1, 43) = 6.79, p = .013$. Participants in the control group reported higher levels of support. We therefore conducted an ANCOVA on the Time 2 MOS scores with Time 1 MOS scores as a covariate. Results indicated a significant effect of group, $F(1, 42) = 4.91, p = .032, \eta_p^2 = .105$. The control group showed a greater increase in social support than the social group. For perceived social support (SPS), mean scores did not reveal a significant main effect of time, $F(1, 47) = .824, p = .369, \eta_p^2 = .017$, nor was there a statistically significant interaction of group and time, $F(1, 47) = 1.02, p = .318, \eta_p^2 = .021$.

Anxiety about Aging scores are shown in Table 13.

	Social n= 40		Controls n= 36	
	Time 1	Time 2	Time 1	Time 2
Anxiety about Aging	48.98	47.18	42.79	43.05
Scale Total	(8.87)	(8.46)	(9.99)	(10.96)
Fear of Old People Factor	11.48 (3.51)	10.47 (3.49)	9.64 (3.76)	9.94 (3.90)
Psychological Concerns Factor	11.35 (3.85)	10.85 (3.29)	9.64 (3.08)	9.97 (3.40)
Physical Appearance Factor	12.05 (3.15)	12.52 (4.50)	10.89 (3.01)	10.92 (3.62)
Fear of Loss Factor	14.10 (3.64)	13.33 (3.90)	12.63 (3.60)	12.22 (3.41)

Note: Total scores are out of 100 where subscale scores are out of 25. Higher scores represent greater endorsement of aging anxiety.

Groups were significantly different at baseline on the total score for the Anxiety about Aging scale, $F(1, 74) = 8.08, p = .006$, and on the following subscales: Fear of Old People, $F(1, 75) = 4.84, p = .031$, and Psychological Concerns, $F(1, 74) = 4.51, p = .037$. Participants in the social group endorsed more aging anxiety compared to controls. We conducted ANCOVAs on Time 2 data with Time 1 as a covariate for the total score for the Anxiety about Aging scale and those two subscales. Results revealed no significant effect of group on AAS total scores, $F(1, 73) = .095, p = .759, \eta_p^2 = .001$, on the Fear of Old People subscale, $F(1, 73) = .618, p = .435, \eta_p^2 = .008$, or the Psychological Concerns subscale, $F(1, 73) = .003, p = .954, \eta_p^2 = .001$.

ANOVA results did not reveal a significant main effect of time for the Physical Appearances subscale, $F(1, 74) = .352, p = .555, \eta_p^2 = .005$, nor was there a significant Group \times Time interaction, $F(1, 74) = .278, p = .599, \eta_p^2 = .004$. Similarly there was no significant main effect of time for the Fear of Loss subscale, $F(1, 74) = 2.17, p = .145, \eta_p^2 = .028$, nor was there a significant Group \times Time interaction, $F(1, 74) = .216, p = .643, \eta_p^2 = .003$.

Data from the Aging Perceptions questionnaire are shown in Table 14.

Table 14
Mean and SD of Aging Perceptions

	Social n= 42		Controls n= 37	
	Time 1	Time 2	Time 1	Time 2
Timeline Chronic Factor	3.15 (.89)	3.11 (.79)	2.96 (.83)	3.09 (.81)
Timeline Cyclical Factor	2.88 (.71)	3.03 (.73)	2.89 (.69)	2.85 (.72)
Positive Consequences Factor	3.65 (.70)	3.76 (.61)	3.66 (.80)	3.60 (.75)
Negative Consequences Factor	2.77 (.68)	2.72 (.75)	2.64 (.68)	2.83 (.66)
Positive Control Factor	3.82 (.60)	3.89 (.58)	4.08 (.61)	4.02 (.73)
Negative Control Factor	3.19 (.73)	3.12 (.76)	3.46 (.76)	3.53 (.60)
Emotional Representation Factor	2.57 (.78)	2.34 (.55)	2.32 (.67)	2.11 (.62)

Note: Timeline Chronic ranges from 1 (less aware) to 5 (increased awareness) of aging. Timeline Cyclical ranges from 1 (less fluctuation in thinking about aging) to 5 (increased fluctuations in thinking about and classifying self as aging). Positive Consequences refers to how aging may impact a person positively (ranges from 1-5, with higher scores indicating aging has more positive effects). Negative Consequences describes how aging may result in negative changes (ranges from 1-5 with higher scores indicating greater endorsement of aging resulting in negative effects). Positive Control refers to a person's influence on social factors and autonomy with higher scores indicating greater autonomy. Negative Control refers to changes that may occur with aging, and higher scores indicate greater adaptation to these negative changes. Emotional Representations refers to anger, worry and depression when a person thinks about getting older; higher scores indicate more negative mood changes with age.

There were no statistically significant main effects of Time or Group x Time interactions for any of the measures except for the Emotional Representations Factor.

Mean scores indicated a statistically significant main effect of time for Emotional

Representations Factor, $F(1, 77) = 6.98, p = .010, \eta_p^2 = .083$, such that both groups

demonstrated a reduction in negative emotional feelings about aging. The Group \times Time

interaction was not significant, $F(1, 77) = .013, p = .910, \eta_p^2 = .000$.

Data for the Philadelphia Geriatric Morale scale are shown in Table 15.

Table 15
Mean and SD of *Older Adults' Philadelphia Geriatric Morale Scores*

	Social n= 39		Controls n= 36	
	Time 1	Time 2	Time 1	Time 2
Agitation Factor	4.72 (1.79)	5.10 (1.35)	4.69 (1.75)	4.94 (1.53)
Attitudes Towards Own Aging Factor	2.46 (1.65)	2.72 (1.52)	2.44 (1.63)	2.83 (1.78)
Lonely Dissatisfaction Factor	4.44 (1.74)	4.49 (1.52)	4.81 (1.47)	5.03 (1.11)

Note: Agitation Factor ranges from 0 (more anxiety) to 6 (less anxiety). Attitudes towards own aging factor ranges from 0 (more negative views) to 5 (more positive views). Lonely dissatisfaction factor ranges from 0 (lonely) to 6 (less lonely).

There was a statistically significant main effect of Time for the Agitation factor, $F(1, 73) = 5.62, p = .02, \eta_p^2 = .071$, such that both groups showed a reduction in anxiety; however, the Group \times Time interaction was not significant, $F(1, 73) = .253, p = .617, \eta_p^2 = .003$. Results indicated a trend towards a significant main effect of Time for the Attitudes towards Own Aging factor, $F(1, 73) = 3.60, p = .06, \eta_p^2 = .047$, with both groups improving in their attitudes towards aging. The Group \times Time interaction was not significant, $F(1, 73) = .152, p = .698, \eta_p^2 = .002$. The Lonely Dissatisfaction factor did not reveal a significant main effect of time, $F(1, 73) = 1.16, p = .285, \eta_p^2 = .016$, or a significant Group \times Time interaction, $F(1, 73) = .453, p = .503, \eta_p^2 = .006$.

Qualitative Results

Young Adults' Pre-Intervention Themes. Prior to the intervention, young adults responded to two general questions about their experiences with older generations: (1) Describe the setting and frequency which you have had contact with older adults. For example, do you interact with older relatives? If so, how often? (2) What, in your view, is the typical older adult like? Both undergraduate and graduate students described interacting with older adults primarily in family (89%) and work settings (26%). Other less frequent settings included volunteering, church, and research/school settings. The frequency with which students reported interacting with older adults ranged from daily to once a year, with more students indicating that they interacted with older adults weekly (45%) and a couple of times a year (40%). Some students reported interactions that had occurred while they were in elementary school (5%) and high school (11%), while most shared about recent interactions as college students (92%). Descriptions of interactions students had with older adults were coded into four main types of activities: conversations, generativity (i.e., indicating that the purpose of sharing information was for passing along wisdom), visits, and job/work-related activities. Most students classified these interactions as family visits (55%) and having conversations with either family members or older adults in other settings (37%).

Relationships with Grandparents. The majority of young adults reported having grandparents (97%), while a subset of them were raised by their grandparents (8%). Three percent did not have grandparents. Students described their relationships with grandparents as either of good quality, using words such as “meaningful” and “close,” or poor quality, using the terms “distant” and “not very close.” The quality appeared to be related to a variety of barriers, with distance being the most challenging as some students

reported their grandparents lived in different states and countries. Other reasons included a history of drug use among grandparents and health problems that made it difficult to visit or communicate with them. Despite the distance, most students reported that their relationships were of good quality (70%).

“I’m not very close with my grandmother because I rarely get to see her, but when I do it is very easy to speak with her and I feel comfortable talking to her.”

Perceptions of Older Adults. When young adults were asked for their views of the typical older adult, themes of generational differences and views about aging were identified (see Table 16). The theme of generational differences encompassed responses related to differences relative to younger generations with regard to physical features. For example, students noticed physical appearance changes, such as “gray hair, wrinkled skin, slightly stooped over,” and “someone who maybe moves a lot slower than usual, soft speaking, wrinkles, and less hair”. While physical differences were noted, there was some awareness that “Older adults really aren’t that much different from people of any age, aside from any physical and health limitations that come with getting older.”

The aging views theme included stereotypical beliefs about aging including the belief that aging is associated with a decline in physical and mental functioning as well as a loss of independence and a lack of understanding of current trends. However, positive stereotypical views were also noted. These included beliefs that older adults are wise, experienced, and have strong opinions. Student’s also recognized the individuality by noting that older adults are different because of various life experiences and culture.

Table 16. Young Adults’ Pre-Intervention Qualitative Themes

Themes	Subthemes	Definition	Exemplar Quotes
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Generational Differences	Physical (22%)	Indication that there are physical features, changes or differences among older adults compared to young.	“Gray hair, wrinkled skin, slightly stooped over.”
Aging Views	Negative Stereotypical Views (35%)	Descriptions of older adults’ having more negative moods, dislikes current generation, and physically impacted by age.	“Some older adults are usually a bit more closed minded, but also wise”
	Positive Stereotypical Views (54%)	Descriptions of older adults as wise, nice and sweet.	“In my opinion, older adults are extremely wise and are at peace with how their lives turned out.”
	Individuality (30%)	Indication that older adults are different and have unique individual characteristics or life experiences.	“May have a different view on life and different opinions because they were raised during a different time.”

Young Adults’ Post-Intervention Themes. Following the intervention, students completed a series of five questions assessing their views of the interactions (see Appendix A: e.g., “Describe the nature of your contact with older adults that you interviewed.”). Eighty-six percent of students reported feeling that the interactions with

older adults in the community were positive, as indicated by the use of the terms “positive,” “interesting,” “great,” and “inspiring.” One student indicated the interaction was “nothing special.” About 10% of the students indicated the interactions were “awkward” initially, and then they discussed the changing of their comfort level with the interactions over time. Four themes emerged using qualitative description methods: meaningful connection, reflections about the interactions with older adults, knowledge, and challenging of stereotypical views about older adults (see Table 17).

Table 17. Young Adults’ Post-Intervention Qualitative Themes

Themes	Subthemes	Definition	Exemplar Quotes
Meaningful Connection (100%)	<ul style="list-style-type: none"> -Transition in relationship -Disclosure of personal information -Recognition of similarities and differences 	Indication that students felt the development of a connection, meaningful relationship, and valuable experience.	“I’ve gotten to see how many of them are similar to myself and other people I know. Through this engagement, I have a better understanding that these people used to be my age and that one day I will be theirs (hopefully).”

<p>Reflections About the Older Adults and Intervention (89%)</p>	<p>-Observations of older adults following interactions</p> <p>-Personal views about affective response to interactions.</p>	<p>Descriptions of thoughts and observations as student’s reflected on their experiences.</p>	<p>“I quickly saw that each person had a different opinion about it, and they all had different stories to share.”</p> <p>“It was good to hear about a time where we didn't have what we have today.”</p>
<p>Knowledge (62%)</p>	<p>-Gained knowledge</p> <p>-Confirmed information previously learned</p>	<p>Descriptions of knowledge gained during the experience including the following topics: history, aging, SES, technology, gender and age discrimination.</p>	<p>“I learned a lot from meeting with these older adults. I learned that men and women seem to think of remarriage differently.”</p>
<p>Challenging of Aging Stereotypes (97%)</p>	<p>-Changes in views about older adults</p> <p>-Recognition of diversity among aging</p>	<p>Statements that indicate a change in a previously held belief about older adults and aging.</p>	<p>“I think I held somewhat of a bias that the best part of their lives had already passed, but I see that this is not true.”</p>

Meaningful Connection. This theme captured students' reported feelings that they developed a connection with the older adults in the community, and included language indicating "friendships" or a shift from "strangers" to "friends" or "acquaintances." With the transition to developing friendships, students noted that the older adults' expressed interest in learning more about the students, and they exchanged contact information at the end of the visits to remain in touch.

"I think the engagement experience has enabled me to connect with older adults by showing me the different homes in which they live. Also, I got the numbers and email addresses for two of the three older adults I spoke to, and they are interested in me updating them with my life."

The students recognized that the older adults were open to sharing their life stories, especially about difficult and emotional memories, which allowed the students to feel that there was a deeper connection.

"It enables me to connect with our older adults through them sharing their life stories with us. Telling your life story to a stranger is not something people do often but it definitely allows for connection."

They also described feeling that they had developed friendships and demonstrated a reciprocal disclosure of personal information resulting in a deeper, more meaningful connection.

"The interactions I had with interviewing older adults were all positive. Around one of the adults, I did feel uncomfortable with the awkward silence. But there was less awkwardness once I began sharing my personal anecdotes and experiences, as opposed to letting her do all the talking. With the other two interviews, I greatly appreciated their openness and willingness to share. "

The young adults recognized similarities they have with the various older adults they interacted with, and how establishing this connection helped to further develop a relationship.

“I think many times it was also useful to relate stories or things about themselves [that]they shared, with personal stories and details about myself in order to establish some kind of similarity and relativity between ourselves.”

Reflections About the Older Adults and Intervention. Eighty-nine percent of the young adults made observations and reflections about their interactions with older adults in the community. This theme included views about the interaction, conclusions that they developed as a result of the interactions, and anecdotal thoughts about future interactions with a different generation. Young adults described differences among older adults, which allowed them to discount some of their preconceived beliefs about aging and older individuals. For example, comments indicated that the students recognized that older adults are all “different” and conclusions about a person should not be based on age alone.

“What [I] further learned from the older people that I interviewed in the community is that age is only a number. Each one of the people I interviewed seemed to be very outgoing and happy with where they were.”

Further, young adults acknowledged that age does not equate to a need for assistance or result in limitations for older adults, which resulted in a change in previously held beliefs about aging.

“Two of the adults were very self-sufficient, which was very relieving to see. Although they were in their mid 80s, they did not let their age stop them from having a social life, traveling, and keeping up with house chores. Initially, I was under the impression that most elders needed help and assistance because they were living in a senior home. But that was not the case because two of the elders had their own casita/house in the senior home complex.”

Young adults also commented on the resilience of the older adults and described them as “survivors,” as they learned about the challenges people had experienced in their lives. For example, they recounted that some older adults had experienced discrimination, wars,

poverty, homelessness, and significant medical conditions, yet continued to demonstrate perseverance.

“With [participant] it was interesting to meet someone who had a significant life experience dealing with gender and age discrimination. For [participant], I had no idea that one person could have so many stories about all the people they have met throughout their lives. With [participant], it was interesting to see someone who remained friendly and happy despite much hardship and loss.”

“How much courage these older adults have. One of mine and my partner’s older adults broke her back and hip. She was told she will never walk again but she still does at 98 years old.”

Anecdotal reflections indicated that students felt it was a valuable experience to hear how the older adults had overcome adversity and historical challenges through their life experiences. Furthermore, students indicated that there was an element of passing down wisdom from the older adults.

“...Also, they taught me that things aren't going to go as planned and there will always be some events that drive your course in life in a different direction. They taught me this through sharing their own experiences.”

Knowledge. Many comments from the young adults described a process of learning new facts about the world from the older adults’ stories. Sixty-two percent of the students felt they had learned about a variety of topics discussed during the interviews, including local, national, and international history, life history of the individual including the individuals’ experiences with historical challenges, and cultural and SES differences.

“I learned interesting things about what it was to live in Texas during the 50s which was that arranged marriage was still very prevalent. I learned what it was like to be an immigrant who came to the US to avoid persecution and what it was like to be a Jew during the Holocaust. In general, I just learned that older people really do have such a unique history and that each person was so different. I used to generalize that older people may have had a boring life, but in reality, sometimes they have the most interesting life.”

Furthermore, the young adults connected their knowledge gained from the Adult Development and Aging course material to their observations from these interactions. These topics included learning more about aging and challenging common views of aging, SES impacts on aging and health, and how life experiences may have shaped personality.

“I learned how much socioeconomic status can impact a person’s health indirectly. I knew about this from class but I didn't really think it was super accurate. This pertains to both physical and mental health.”

Challenging of Aging Stereotypes. Before the intervention, young adults had reported overall physical differences between generations, a belief that aging is associated with a decline in functioning, resulting in a loss of independence, and that older people have a resistance to change. Following the intervention, ninety-seven percent of the young adults reported changes in views around the belief that aging is associated with declines in social and enjoyable experiences and humor. For example, students reported noticing how engaged the older adults were socially and enjoying themselves.

“I think some of the things that I learned were that older adults still have a lot of fun as older adults. Many of the older adults were talking about the things they liked to do when they were younger, and how they still enjoy doing those things. I also learned about how due to cultural reasons, one of the adults were not allowed to attend school which seemed impossible in my head. All the older adults had very engaging lives and they were playing bingo or gathering around in the community room to sing songs. Older adults are the same as younger adults, they're just older in age. “

Further, there appeared to be some reflection or awareness of previously held beliefs about aging that were not apparent to the students prior to the intervention.

“I think I held somewhat of a bias that the best part of their lives had already passed, but I see that this is not true. All the older adults who shared their stories with us may have had some little regrets, but overall they were satisfied with the life they had so far lived. They all still had so many new experiences to learn and to enjoy now that they were so happy to share with us and I was so happy to hear from them.”

Relation Between Self-Report Measures and Answers to Open-Ended

Questions. To evaluate the association between the self-report measures and open-ended questions regarding the young adults’ views of the intervention, we ran Pearson correlations between the number of phrases or concepts that fit within each of the identified themes and the change scores on self-report measures reported earlier . We hypothesized that improvements in attitudes and anxiety about aging that were found on the self-report questionnaires would be associated with the greater positive language use in the open-ended questions.

Results are presented in Table 18.

Table 18
Pearson’s correlations between coded variables and self-report measures of anxiety and attitudes towards aging, intergroup anxiety and communication skills

	Connection	Reflections	Knowledge	Stereotypes
Anxiety about Aging	-.01	-.26	-.26	.06
Fear of Old People Factor	-.26	-.34†	.07	.10
Psychological Concerns Factor	-.02	-.39*	-.09	-.11
Physical Appearance Factor	.19	.01	-.19	-.10
Fear of Loss Factor	.01	.10	-.34	.25
Attitudes towards Aging	-.02	.10	.25	-.02
Intergroup Anxiety	-.05	-.34	.07	-.14
Communication				
Overaccommodation	.12	.25	.18	.10
Speech				
Sharing of Personal Info	.10	.21	.33	.17
Use of Humor	-.24	-.24	-.19	-.09

† $p < .1$, * $p < .05$; Note: Change scores (Time 2 subtracted from time 1) for self-report measures were calculated and included in these analyses.

Only two significant correlations were found. The Reflections variable was negatively correlated with changes in two subscales of the Anxiety about Aging questionnaire: Fear of Old People, $r(33) = -.34, p = .054$, and Psychological Concerns, $r(33) = -.39, p = .025$. Decreased fear of older adults and reduced anxiety about emotional well-being in aging were associated with an increase in reflective statements about the interaction and its positive impact on the students.

Impact of Intervention on Career Preparation. To assess the value of this course for student's career goals, we asked an open-ended question about the value of the course at the end of the semester (see Appendix A). We hypothesized that the student's responses would demonstrate a benefit for their future career goals.

Two themes emerged from the responses which included (1) application of the course to career goals and (2) skills obtained and practiced that are important for career and life goals. Approximately 68% of the young adults reported that they felt this course had prepared them for a career while 11% stated this course did not prepare them for a career; however, these latter responses ranged from "I wouldn't say it directly helped me with my career" to "This course has not prepared me for a career." The remaining responses did not specify whether the course did or did not impact their career goals.

Application of Course to Career Goals. Young adults shared their career goals and how they felt the course was relevant. First, among the responses, 16% of the students indicated a career goal of working in geriatrics or with older adults, 11% expressed wanting to pursue a career in mental health (i.e., psychologist, therapist), 3% reported a goal of pursuing nursing, and another 3% indicated a career in cognitive science, researching neurodegenerative diseases. Other students did not specify a career

goal in their responses. Young adults described how they may have opportunities in their career to work with older adults and how this course provided an opportunity to engage with this group.

“I think this course has prepared me for my future career, because I will be working with people of all ages as a counselor for people with eating disorders. Also, [this course] has taught me that I enjoy speaking with older adults.”

Young adults reported thinking more broadly about how they may have opportunities to interact with different age groups regardless of the context.

“I think this course has greatly prepared me for my future as a physician. Although I plan on going into pediatrics, I will still be interacting with people from a different age group, and this class has really prepared me to do that. I also think I have grown more compassionate as a result of this course, and I am less likely to augment ageist stereotypes. I feel as though I notice prejudices when it comes to older people a little more now, which I think will help me be a more caring provider.”

Further, the opportunity to meet and interact with older adults was viewed as an invaluable experience not only for careers but for personal relationships.

“I don't have a specific career path in mind at the moment, but I feel as though I have gained a greater understanding, compassion, and conciseness. If anything, it might help me interact with my older relatives more and have a better understanding for them.”

Cultivated Skills. Seventy-eight percent of the students identified specific skills that were developed and practiced through the course. These skills included an overall improvement in feeling comfortable in navigating conversations with individuals from a different age group. More broadly, young adults recognized how the interview experiences provided social skills practice, particularly with new acquaintances in unfamiliar settings.

“I feel any experience that involves engaging with other[s] socially is beneficial. During this time, I was able to interact with many different types of people that I

wouldn't normally. These experiences allow me to adapt better social skills which can be used later on.”

Among these social skills, young adults specifically noted how they practiced patience, and speaking clearly. Most responses referred to how these particular skills are helpful when interacting with different age groups. Others also shared that these skills are helpful in family settings or more broadly when interacting with others.

“I think this course did a good job in teaching me patience while working with people, and this can be carried into my career later on. “

Lastly, young adults described feeling more comfortable and confident in their interactions with other age groups following this course.

“It has helped me learn more about how to interact with people of older age[s] and become more comfortable in speaking to people.”

Older Adults’ Pre-Intervention Themes. Prior to the intervention, older adults responded to general questions about their experiences with younger generations and traits that they think of when thinking about young adults (see Appendix A: e.g., Describe the nature of your contact with younger adults). Themes of the frequency of contact, quality of contact, and views of young adults emerged. First, older adults reported having contact with young adults that ranged from frequent (e.g., use of the words “regular,” “many” or “frequently”), to limited contact (e.g., use of the words “not recently,” “visit occasionally,” “little” or “not much”) and to a desire for more frequent contact (e.g., “wish I had more contact,” and “miss the interactions”). The quality of contact was described as good when a person expressed enjoying their time with young adults (e.g., “helping,” “positive” and “pleasant”), poor (e.g., “not much to talk about”),

supportive which referred to friendships, physical affection (e.g., hugs), and common interests (e.g., church and other community engagements).

Thirty-four percent of the older adults reported having contact with young people who were family members, and 36% had contact with young adults in a variety of settings. They described different settings where they met with different generations, including at church, art studios, youth programs, and in school. Fewer indicated having young friends who were part of their social network (5%). About 13% of the older adults also noted that they had contact with staff in the various independent and assisted living settings. However, these interactions were described as “superficial.” Other responses did not specify the relationships with young adults or settings.

Some older adults indicated positive views indicating how young adults are the “future” and how they are more “concerned about the future of the planet, [and] of the ill and hungry”, although one comment recognized the variability among young adults and that “youth can make a difference either for the good or bad.” Additional responses suggested a view that younger generations do not value older adults. Older adults identified many positive traits when thinking about younger adults (e.g., energetic, ambitious”) as well as negative traits (e.g., “self-centered” and “irresponsible”). Some commented about the physical abilities of younger adults and their use of technology.

Overall, the data suggest that, prior to the intervention, older adults had variable experiences interacting with younger adults, which largely included their family members but had few social friendships with younger generations. Older adults had both positive and negative views about younger adults; however, the positive views were more prominent.

Older Adults’ Post-Intervention Themes. Following the intervention, older adults answered open-ended questions about their experiences interacting with the young people (i.e., Did you feel that your interaction with the young people was meaningful? Did you feel a connection? Did you enjoy the experience?). To evaluate our hypothesis that older adults would express the benefit of this intervention through their written responses, we utilized qualitative descriptive methods to identify themes. The following four themes were identified: connection, valued, mutual learning, and challenging view of youth. It is important to note that participants often repeated the language used in the prompts; therefore, during analysis, we focused more on the unique statements made by the participants. Table 19 shows the themes identified, definition and quotes that describe these themes.

Table 19. Older Adults’ Post-Intervention Qualitative Themes

Interaction Experience	Definition	Exemplar Quotes
Connection (83%)	Development of a connection, meaningful relationship, valuable experience.	“I felt a connection because I could relate to my youth at the time. I enjoy young people and they are always smiling and full of energy. Young people make you feel good.”

Feeling Valued (60%)	Indication of feeling valued and heard (e.g., listening, engaged).	“Yes, it was meaningful. They made me feel that they were interested in what I had to say. They must have listened since their report was fairly accurate. They interpreted what I had to say generally more correctly than any reporter who has interviewed me in the past.”
Mutual Learning (36%)	Passing along morals, values, stories for the benefit of the younger adult. Includes learning about each other, or reminders of learning experiences for the older adults.	“The encounter and interaction with the young people that we, that we are involved in this interview has been really satisfying. And allowed me to realize the need to hear their opinions and reactions to common life situations in their young age. One of the most enjoyable discoveries of the experience was to be able to hear their fresh opinions about situations that are common for young and old.”
Perspectives of youth, including challenging views of youth (22%)	Indication of their views of youth following the intervention and how views might have changed,	“Yes, they were a joy to me. So happy and progressing to make the world a better place. They made me more hopeful for our future.”

	modified through this interaction.	
Program/Research Project (26%)	Comments or recommendations about the structure of the course, interactions, and books.	“The book they wrote about my life’s story is remarkable. Their smiles when greeting me were reassuring.”

Connection. Eighty-three percent of older adult participants reported feeling that they developed a connection with the younger undergraduate and graduate students during this brief interaction. These connections varied in depth, as some older adults described the development or beginning of a connection, while others described a more intimate relationship like those with family members or close friends. For example, one participant expressed feeling connected “as I do with our grandchildren.” One comment indicated no connection following the interaction, but nevertheless noted that they sought technology assistance from younger adults. Others felt that the connection was strong enough to actually impact the interaction: “I felt like it was a connection there; that’s why I could open up to them and talk to them.” Approximately 17% of responses were unclear about whether they felt the connection was meaningful or not.

Feeling Valued. Sixty percent of older adults noted how they felt valued during this interaction. This theme included the expression of feeling that the information shared was received well by the students, which was evident to them by the way the students interacted with them. For example, comments indicated that the students demonstrated

good listening skills (e.g., “eye contact”) and expressed interest in the interaction (e.g., “asking questions”). For some older adults, it was challenging to open up about their life story; however, as they developed a relationship with the students they began to feel more comfortable doing so.

“Yes, I did feel a connection when I opened up about my personal life and I was very comfortable talking to them because they were listening and we had eye contact, we had that listening, I could feel that they were listening to what I was saying. And they made me very comfortable. I felt like it was a connection there that’s why I could open up to them and talk to them.”

Of particular importance is that older adults reported feeling comfortable with being themselves and not being evaluated by the students. This may have helped to foster the connection between the generations.

“I definitely felt a connection. I wanted to adopt all of them. They made me feel comfortable. I felt I could be myself and I felt no thought of being negatively judged!”

Mutual Learning. The passing down or sharing of information is considered to be part of development, particularly in later years—what Erikson (1959) has called generativity. This process includes a reflection on one’s own life and the passing along of information for the benefit of someone else. Through the course of sharing their life stories, thirty-six percent of older adult participants felt able to share ideas, provide advice, and share information about historical events that they lived through. For example, participants who immigrated to the United States to escape oppression felt it was important to pass along information to inspire younger generations and encourage them to believe that any goals are attainable.

“Yes, I like to be around young people to learn about [and] share their interest in life-- to encourage them in school, work, things in life, spiritual, religious. I share with them my mistake in hope they would not make that mistake. I also tell them that life is hard and that we can cope with life much better. However, whatever

they wish to do, they can because in this country we give them so much "choice" that they can become. They can if they [are] willing to work hard. It is not easy but reachable and they will have a much better life.”

Others recognized the importance of intergenerational learning from their own experiences and acknowledgement of how they can take on the role of passing on knowledge from their own life experiences and from the period they lived through.

“When I was younger, I always liked talking to older people and learned from them. Likewise, I enjoy talking to younger people now and hopefully I can pass along, not only tales of personal experiences but perspectives and understanding of life in past generations.”

Perspectives and Challenging Views of Youth. While older adults reported overall positive views of younger generations before the intervention and after the intervention (43%), there were some responses following the intervention that indicated an improvement in views about the students (22%). For example, there was some indication that the media shape images of younger generations; however, this experience challenged these views.

“It was a wonderful experience for me. With so much negative news about young people today and the fact I have not been around people of this age for so long, it was so refreshing to listen to their aspirations. My faith has truly been renewed.”

Additionally, the interactions allowed for older adults to learn about the students, which resulted in changing views about the future of the world

“Yes, they were a joy to me. So happy and progressing to make the world a better place. They made me more hopeful for our future.”

Program and Research Project. Older adults (26%) commented on the overall experience of interacting with younger adults within the context of a program and research project. These comments indicated how continuing a program that connected both young and older generations is needed and provides benefits for both generations.

“...Getting back to the question, yes all dialog between generations is meaningful and I wish more interaction could happen, but they may be shocked at preconceived notions and reality, but I personally believe this two-way impact is forever. Please keep up the program. It may save lives, and having bilingual students would certainly be a bonus. It will remain a lifetime effect. Yes, I enjoyed every moment.”

Even though there was some hesitation to engage in this program, one participant expressed how much she began to look forward to meeting with the students and would encourage others to participate in this type of program.

“...Yes, very much so, very much. I didn't think I would, but I really did, I really did. I had a real, I was looking forward to it every week. I was really looking forward to seeing them every week.”

“I would encourage other people to do it, I really would, I really would. I wouldn't mind doing it again. It opens your mind, makes you think about your life back then and to share it with someone else and that's meaningful to me, to me it was very meaningful.”

Other comments were specific to the structure of the program and a preference to increase the number of meetings between the students as some felt it was “brief”, and recognition that a meaningful connection is dependent on mutual exchanging of information.

“I felt it was the start of something meaningful to the extent they, the young people, were welcomed into a portion of our lives. Reciprocity would be necessary to establish a meaningful connection.”

Comments about the book indicated whether the young adults presented the information shared during the interviews accurately or not. Some responses indicated how well written and correct the books were while others shared how despite inaccuracies the book was meaningful.

“The book they wrote was not entirely accurate, but I'm glad to have it because it shows who I am. I am glad to have it. I showed it to my conductor, and he read it.”

Chapter 4. Discussion

As the number of older adults 65+ increases, it is necessary that we prepare for this change in our population by developing effective interventions to promote successful aging and prepare the healthcare workforce to treat older adults. We assessed the effectiveness of intergenerational interactions on the cognitive, emotional, and social well-being of older adults, who were living independently or in assisted living facilities in the community. We examined whether such interactions might impact young people, perhaps changing their views about aging, and influencing their future career paths. Finally, we wanted to improve on methodologies previously described in the literature. To accomplish these goals, we utilized an intergenerational design to connect young and older adults. We designed a brief, three-session intervention, during which college students engaged older people in conversation in order to gather their life stories. We collected pre- and post-intervention data from both younger and older adults, and we used a mixed methods design with both quantitative and qualitative measures. Overall, we saw positive changes in young people's attitudes about aging. The effects of the intervention on older adults, however, were less straightforward and were observed primarily in the qualitative data. We elaborate on these findings and issues below.

Summary and Interpretation of Results

Young Adult Participants. In young adults, findings supported our hypotheses that measures of anxiety about aging, attitudes towards aging, intergroup anxiety, and communication skills with older adults, would show an improvement following the course and intervention. Post-intervention assessment revealed significant reductions in anxiety about aging. Students reported feeling more comfortable around older adults and

less concerned about their own emotional well-being with age. There were no changes in anxiety about age-related physical changes or losses of social support and autonomy. Students demonstrated more positive views towards aging and less anxiety about interacting with an outgroup—a group that they did not identify with— following the intervention. Communication skills improved, as indicated by decreased use of over-accommodation speech used and increased sharing of personal information in their conversations.

Results from the qualitative data revealed four themes: 1) meaningful connection, 2) reflections about the older adults and intervention, 3) knowledge, and 4) challenging of aging stereotypes. The students described feeling that they had developed a connection with the older adult participants through the process of learning about their lives. For instance, they reported that there was a process of learning about each other, sharing of emotional experiences, and recognizing common interests and differences. Reflections about the older adults and the intervention indicated that these interactions left students contemplating the experience and how it applied to their previous views about aging and older adults, and to their own lives. This process of reflecting on the experience was associated with decreases in anxiety when interacting with older adults and when thinking about their own emotional well-being with age. The combination of learning about aging during the course, along with their experiences in the community, helped students to process and connect the information to their own experiences, ultimately challenging aging stereotypes.

Several aspects of our study design may have contributed to the positive outcomes in young people. We asked students to collect the life stories of the older adults in the

community, with limited guidance on how to approach this task. This approach may have created an equal status between students and older adults, which is considered a key element in intergenerational intervention (Allport, 1954; Pettigrew, 1998) and facilitated collaboration towards a common goal. The activity of sharing life stories and knowledge between young and older adults in our intervention allowed for the development of bond and empathy for each other, consistent with both Human Development Theory (Erikson, 1968) and Relational Theory (Portman, Bartlett and Carlson, 2010).

The process of reflecting likely provided the opportunity for the young adults to evaluate their views towards older adults. Our results indicated the students engaged in a thoughtful consideration on multiple topics, including the older adults' life experiences, their own aging, and experiential application of the course materials to their interactions. Theories used to support intergenerational programs do not explicitly identify the process of reflecting as a potential mechanism. However, some research has suggested that perspective-taking may be an effective technique for decreasing stereotypical beliefs (Galinsky & Moskowitz, 2000; Oh, Bailenson, Weisz & Zaki, 2016). Perspective-taking may activate self-knowledge, which may be used when interacting with a person from an outgroup to help them recognize similarities and see the overlap between their self-knowledge and that of the other person. Galinsky and Moskowitz (2000) found that students who engaged in perspective-taking rated older adults' traits as similar to the students' own self-identified traits, whereas students who did not engage in perspective-taking did not. In the present study, the process of reflecting may have cultivated perspective-taking among the young adults, and might explain the positive changes in their aging views.

While our results are promising in demonstrating the efficacy of a brief social interaction for improving views of aging and communication skills among young adults, the mechanisms underlying these improvements remain uncertain. Future projects might want to include more qualitative analyses of the interactions between generations to gain further understanding of the mechanisms of change that may not be otherwise captured by standard quantitative methods. Our study appears to fit with many theories of intergenerational interventions. Future studies should consider testing the theories more directly to determine what specific aspects of intergenerational interventions are most critical for their success.

Older Adult Participants.

Cognitive Functions. Both the social and control groups improved on attention and demonstrated a trend towards an improvement in set-shifting, with numerically larger mean improvements in the social group. The social group demonstrated an improvement on a measure of executive functions (FAS) while the control group demonstrated a decrease, however the results did not reach significance. This suggests that social engagement may be associated with improvements in attention and shifting aspects of executive functions. However, overall our results did not demonstrate a significantly greater benefit for the participants in the social group compared to those in the control group. Failure to find greater cognitive benefits for our social group may be attributable to multiple factors.

First, in order to see cognitive benefits the social intervention may need to include a cognitive component. Park, Gutchess, Meade & Stine-Morrow (2007) made a distinction between productive and receptive engagement and argued that cognitive

benefits would be observed when engaging in a productive engagement task, which requires learning or practicing a new skill. To test the benefit of productive over receptive engagement, they had older adults meet together and learn new skills (i.e., photography and quilting) compared to a social group, and found a benefit in episodic memory performance for the productive engagement group over the social group (Park et al., 2014). In a similar study, they taught older adults to use an iPad and found benefits in processing speed and episodic memory compared to participants in the social and control groups (Chan, Haber, Drew & Park, 2016). Therefore, social interventions that include a cognitive element may result in greater cognitive benefits when compared to social interventions alone. However, one might argue that constructing a narrative about one's life and relaying to another person in an interactive fashion, may engage cognitive processes as well, although perhaps not the same as those involved in learning a new skill.

However, it may be more likely that we did not find a difference between the social and control groups because our intervention was limited to only four meetings between the young and older adults. Generally, cognitive interventions are much longer than ours, spanning months, with multiple meetings per week and/or each meeting lasting longer than those in our social intervention (Vaportzis, Niechcial & Gow, 2019). Other social intervention work has found cognitive benefits among older adults who wrote and shared their life history in a group setting using a 12-session study design (Pitkala, Routasalo, Kautiainen, Sintonen and Tilvis, 2011). Therefore, number of visits may be critical to see cognitive, emotional and social well-being benefits. A recent review noted that intergenerational interactions that offered fewer than 4-6 visits did not report

significant results on measures of well-being, suggesting that more visits may be important in allowing participants to get to know each other better (Martins et al., 2019).

Another explanation for the non-significant finding may include the time between the pre- and post-testing sessions. Our groups were significantly different in terms of the number of days between pre and post sessions, $t(87) = 6.19, p = .001, d = 1.37$, with the social group ($M_{days} = 113.80$) having more time between the pre- and post- test compared to controls ($M_{days} = 59.13$). We may have been able to detect benefits for the social group if post-testing was completed shortly after the intervention. This might suggest, however, that a relatively short intervention may not have lasting benefits.

Finally, our study design was unique in that we met older adults in their own homes rather than in the laboratory setting. The purpose for this was to reach a more diverse group of older adults; those who volunteer and participate in laboratory studies may not be as representative of the older adult population in general. This difference in design may have limited our ability to detect significant differences between the social and control groups because the pre- and post-intervention testing sessions themselves may have included a social component for both groups, even though the focus of those sessions was on testing. Social engagement opportunities are present in many daily activities that we may not always consider (e.g., grocery shopping) and can have benefits on well-being through increased feelings of connectedness. (Keyes, 1998). For example, one study found benefits on older adults' well-being through positive social interactions among hospitality staff and other customers when they were out shopping (Altinay, Song, Madanoglu & Wang, 2019). Therefore, it is possible that the research assistant meetings with the control group, which were held in the older adults' homes, included components

of social interaction that resulted in a benefit for them as well. Future studies designed to meet with older adults' in their homes may want to consider this potential influence and include a comparison group of older adults who complete measures in a non-social or laboratory setting.

Loneliness and Social Support. On a measure of loneliness, we found only a non-significant trend of reductions in feelings of loneliness for both the social and control groups. On the Social Network Index (SNI), however, we found a significant Group x Time interaction: Individuals from the social group reported a significant decrease in the number of social roles they had between pre- and post-intervention, whereas those from the control group reported an increase. Similarly, the social group demonstrated a reduction in the number of people in their social network compared with the control group, which reported an increase, although these results were not statistically significant. However, on another measure, the Lubben Social Network Scale, although not significant, there were mean changes observed for both the social and control group indicating increases in social network. These different findings may be due to the different measures on the two scales: the Lubben Social Network Scale assesses both the structure (i.e., size) of a person's social network as well as the function (i.e., nature of the interactions) (Valtorta, Kanaan, Gilbody & Hanratty, 2016), whereas the SNI is measuring only size.

On our measure of social support (the MOS), only participants in the control group reported a significant increase in social support over time, although both groups demonstrated numerical improvements. Participants in the control group, however, reported significantly higher levels of social support at baseline, possibly indicating some

potential effect of environment that differed across groups but was not captured in our measurements. It may be important to gather information about specific factors that may be different in different kinds of living environments to better understand this difference.

Qualitative Findings. Older adult participants' responses to open-ended questions revealed the following themes: connection, feeling valued, mutual learning, challenging views of youth, and program and research project. This intervention resulted in the development of meaningful connections between younger and older adults. The older adult participants felt heard and that the information they shared was of value to the students. Although the focus of each meeting was on the life story of the older adult, it is apparent that this experience was truly a social interaction as the older adults stated that they learned about the students and engaged in a mutual exchange of information. Older adults described how learning about the students had a positive influence on their views of younger generations, and they felt more positive about the future. This finding was particularly interesting, as most of the pre-intervention views about younger adults were already positive. One particular intergenerational program found similar results, as they reported that the older adult participants expressed feeling hopeful for the future following the intergenerational program (Andreoletti & Howard, 2018). Future directions may focus on exploring views that older adults have about younger adults specifically with respect to their expectations and hope for the future.

Study Limitations

Several limitations to the present study are outlined below.

Missing Data. A substantial limitation to the present study is the amount of missing data for both the social and control groups. Data were missing for multiple

reasons: fatigue during testing sessions, lost or incomplete questionnaires, changes in vision or hearing that impacted a person's ability to complete post-tests, and illness. Efforts to reduce fatigue were made by encouraging older adults to schedule testing sessions in the morning, although some specifically noted preferences to be tested in the afternoons. In addition, we rescheduled testing sessions if anyone reported feeling unwell or tired, or if they had any recent medical concern with potential to impact their ability to concentrate during the testing. We discontinued a testing session and scheduled a follow-up visit if anyone reported feeling fatigue.

In the beginning of our data collection we left questionnaires with participants to complete at their leisure per their request following the testing session, and this sometimes resulted in lost or misplaced questionnaires. Efforts were made to retrieve these missing questionnaires, but were often unsuccessful and participants did not want to complete them again due to the length of the questionnaire.

Modifications to the battery of cognitive and social measures are recommended. Our sample of older adults were diverse in age, education levels and ethnicity, and normative data for the neuropsychological measures were not adequate. Therefore, future studies should modify the cognitive battery to ensure that appropriate and current normative data are available. The battery we used was extensive, and we recommend reducing the amount of questionnaires by including shorter versions if available. For example, with the recognized connection between loneliness and social support some researchers are evaluating the efficacy of brief questionnaires to measure these constructs (Hughes, Waite, Hawkey & Cacioppo, 2008; Neto, 2014).

The updating and shifting tests had a large amount of missing data for a variety of reasons including vision and motor challenges, fatigue during the test, reversing of the rules for the shifting task (i.e., indicating odd or even when rule was to indicate consonant or vowel), which may have increased frustration for the participants and resulted in ending the task. We made efforts to encourage participants to continue the tasks and offered breaks between starting the next trials.

Recruitment Challenges. In efforts to have a diverse group of older adult participants we attempted to recruit from a variety of independent and assisted living sites. We experienced challenges with recruiting at each site with more difficulties at sites that received government subsidies. One reason for this may have been the lack of funding to pay participants to participate. Other reasons included concerns about confidentiality, and while individuals living in these communities did not mind sharing their life story, they did not want it written into a book. Concerns that the book would be used for external gain (i.e., selling for profit) or that it would be made public were two of the primary reasons that individuals declined to participate. There may have also been reasons for not participating that were not shared that may be related to sociocultural differences.

There continues to be a lack of research conducted with diverse populations. Wendler et al., 2006) in a meta-analysis, found that this is not because individuals from minority populations are less willing to participate, and they stressed the importance of making research opportunities available to these groups. In the present study, efforts were made to develop positive relationships with the individuals living in minority

communities (e.g., visiting weekly during coffee hour); however, these attempts did not increase participation in this study.

We also attempted to recruit both social and control groups from the same sites, but those who were initially interested sometimes were ineligible or withdrew for various reasons. Therefore, we expanded our recruitment efforts to include multiple independent and assisted living communities in the Tucson area and our control participants were primarily from sites that were not government subsidized. This may have created groups that were less well-matched, particularly on things like SES, than we had expected.

Randomization. With the study design dependent on the timeline of the spring psychology course, efforts to recruit and complete testing for the social group were prioritized. Therefore, this was not a randomized controlled trial.

Strengths and Future Directions

Despite these limitations, this study provides many possibilities for new directions. Most importantly, we included older adults from independent and assisted living communities from diverse backgrounds who may not usually have the opportunity to participate in research. This is valuable as it improves ecological validity by including participants that may not volunteer and participate in laboratory studies. Older adult participants for laboratory studies generally have higher education, less health problems, and higher SES (Drivsholm et al., 2006). Therefore, future research may want to consider continuing to explore aging topics among individuals residing in various living situations to improve ecological validity. Important considerations for conducting research in assisted and independent living communities include developing a relationship with the site and being clear in the purpose of the research project, identifying risks and benefits

for the participants and the site, and specifying the role of the researcher and the role of the site.

Considerations for Future Work. This study is unique in its focus on evaluating the feasibility of a brief intergenerational social interaction between older adults residing in independent and assisted living communities and young adults as part of their course requirement. Our findings suggest that both young and older adults benefit from a study designed to promote interactions between these two groups. However, more research is needed to better understand the benefits of this kind of intervention. Therefore, this study may serve as a platform for a larger project.

Based on what was learned from this study, there are several logistical changes that should be made to the methods of a larger-scale project considering the challenges we experienced.

1. *Recruitment of individuals from diverse backgrounds.* The population is not only projected to increase in age but in diversity (Colby, 2015; Vincent, 2010).

Therefore, efforts to improve recruitment and retention of older adults from diverse backgrounds is crucial in research. This was a particular challenge for the current study as only a small group of individuals from diverse backgrounds participated, despite our recruitment efforts. Recruitment may improve by first establishing a long-term relationship with the sites to establish trust. One of our sites had a strong relationship with the University of Arizona, and various departments had programs that involved meeting with the older adults in their community; We experienced less difficulty recruiting and retaining participants from this site. Therefore, the next phase of research would benefit from longer

recruitment periods to allow for the development of a stronger relationship with communities that are socioeconomically and culturally diverse.

2. *Assessment modifications.* The neuropsychological and self-report assessments were lengthy and often a follow-up visit was scheduled to complete the battery. Participants also requested that we leave the questionnaires with them to complete later due to fatigue; this resulted in missing data for multiple reasons. Therefore, updating and shortening the test battery would make the pre- and post-testing sessions more enjoyable and reduce the number of drop-outs and missing data.
3. *Intervention changes.* The students met with older adults for a total of twelve times over the course of the semester, whereas each older adult met with the students only four times. The older adult participants provided feedback requesting additional visits with the students indicating that this might further help establish relationships. Increasing the number of visits between the older adults and students may allow for greater benefits on cognitive, social and emotional well-being measures, as well as help to establish more meaningful connections.

Appendix A

Young Adults:

Pre- questions

1. Describe the setting and frequency which you have had contact with older adults. For example, do you interact with older relatives? If so, how often?
2. What, in your view, is the typical older adult like?

Post-questions

1. Describe the nature of your contact with older adults that you interviewed.
2. Based on your experience with meeting older adults in the community, what did you learn from them that you didn't know before? This could be related to culture or history, or might be a fun fact you didn't already know.
3. Based on your experience meeting older adults in the community, what did you learn about the aging process that was not learned in class?
4. How well do you think this course has prepared you for a career?
5. How has the engagement experience enabled you to connect with older adults? Please explain.

Older Adults:

Pre-questions

1. Describe the nature of your contact with younger adults?
2. What are traits that describe younger adults?

Post-questions

1. Did you feel that your interaction with the young people was meaningful? Did you feel a connection?
2. Did you enjoy the experience?

References

- Acevedo, A., Loewenstein, D. A., Barker, W. W., Harwood, D. G., Luis, C., Bravo, M., ... & Duara, R. (2000). Category fluency test: normative data for English-and Spanish-speaking elderly. *Journal of the International Neuropsychological Society*, 6(7), 760-769.
- Alexander, G. E., Ryan, L., Bowers, D., Foster, T. C., Bizon, J. L., Geldmacher, D. S., & Glisky, E. L. (2012). Characterizing cognitive aging in humans with links to animal models. *Frontiers in Aging Neuroscience*, 4, 21.
- Allport, G. W., Clark, K., & Pettigrew, T. (1954). The nature of prejudice.
- Altinay, L., Song, H., Madanoglu, M., & Wang, X. L. (2019). The influence of customer-to-customer interactions on elderly consumers' satisfaction and social well-being. *International Journal of Hospitality Management*, 78, 223-233.
- Alzheimer's Association. (2019). Alzheimer's disease facts and figures. *Alzheimer's & Dementia*, 15(3), 321-387.
- Alzheimer's Association. (2020). Alzheimer's disease facts and figures. *Alzheimer's & Dementia*, 16(3), 391-482.
- Andreoletti, C., & Howard, J. L. (2018). Bridging the generation gap: Intergenerational service-learning benefits young and old. *Gerontology & Geriatrics Education*, 39(1), 46-60.
- America's Health Rankings analysis of American Geriatrics Society, United Health Foundation, AmericasHealthRankings.org, Accessed 2020.
- Aşiret, D.G., & Kapucu, S. (2016). The effect of reminiscence therapy on cognition, depression, and activities of daily living for patients with Alzheimer disease. *Journal of geriatric psychiatry and neurology*, 29(1), 31-37.

- Ayalon, L., Shiovitz-Ezra, S., & Roziner, I. (2016). A cross-lagged model of the reciprocal associations of loneliness and memory functioning. *Psychology and Aging, 31*(3), 255.
- Barker, M., O'Hanlon, A., McGee, H. M., Hickey, A., & Conroy, R. M. (2007). Cross-sectional validation of the Aging Perceptions Questionnaire: a multidimensional instrument for assessing self-perceptions of aging. *BMC geriatrics, 7*(1), 9.
- Biddle, K. D., Uquillas, F. D. O., Jacobs, H. I., Zide, B., Kirn, D. R., Rentz, D. M., ... & Donovan, N. J. (2019). Social Engagement and Amyloid- β -Related Cognitive Decline in Cognitively Normal Older Adults. *The American Journal of Geriatric Psychiatry, 27*(11), 1247-1256.
- Bohlmeijer, E., Roemer, M., Cuijpers, P., & Smit, F. (2007). The effects of reminiscence on psychological well-being in older adults: A meta-analysis. *Aging and Mental Health, 11*(3), 291-300.
- Boström, A. (2003). Intergenerational learning in Stockholm County Sweden: A practical example of elderly men working in compulsory schools as a benefit for children. *Journal of Intergenerational Relationships, 7*(4), 425–444.
- Boström, A. (2009). Social capital in intergenerational meetings in compulsory schools in Sweden. *Journal of Intergenerational Relationships, 7*(4), 425–441.
- Bousfield, C., & Hutchison, P. (2010). Contact, anxiety, and young people's attitudes and behavioral intentions towards the elderly. *Educational Gerontology, 36*(6), 451-466.
- Brady, B., Dolan, P., & Canavan, J. (2017). 'He told me to calm down and all that': a qualitative study of forms of social support in youth mentoring relationships. *Child & Family Social Work, 22*(1), 266-274.

- Brummel, N. E., & Ferrante, L. E. (2018). Integrating Geriatric Principles into Critical Care Medicine: The Time Is Now. *Annals of the American Thoracic Society*, 15(5), 518-522.
- Burnes, D., Sheppard, C., Henderson Jr, C. R., Wassel, M., Cope, R., Barber, C., & Pillemer, K. (2019). Interventions to reduce ageism against older adults: a systematic review and meta-analysis. *American Journal of Public Health*, 109(8), e1-e9.
- Butler, R. (1963) The life review: An interpretation of reminiscence in the aged. *Psychiatry*, 26, 55-76.
- Butler, R. (1974). Successful aging and the role of life review. *Journal of the American Geriatrics Society*, 22, 529-535.
- Cantarero-Prieto, D., Pascual-Saez, M., & Blazquez-Fernandez, C. (2018). Social isolation and multiple chronic diseases after age 50: a European macro-regional analysis. *PloS one*, 13(10).
- Center for Health Workforce Studies. 2005. The impact of the aging population on the health workforce in the United States . Rensselaer, NY: School of Public Health, University at Albany.
- Chan, M. Y., Haber, S., Drew, L. M., & Park, D. C. (2016). Training older adults to use tablet computers: does it enhance cognitive function?. *The Gerontologist*, 56(3), 475-484.
- Chen, C.-Y., Joyce, N., Harwood, J., & Xiang, J. (2016). Stereotype reduction through humor and accommodation during imagined communication with older adults. *Communication Monographs*, 84(1), 94-109. doi:10.1080/03637751.2016.1149737
- Chin, A. M. (2007). Clinical effects of reminiscence therapy in older adults: A meta-analysis of controlled trials. *Hong Kong Journal of Occupational Therapy*, 17(1), 10-22.

- Chung, C. K., & Pennebaker, J. W. (2008). Revealing dimensions of thinking in open-ended self-descriptions: An automated meaning extraction method for natural language. *Journal of research in personality*, 42(1), 96-132.
- Colby, S. L., & Ortman, J. M. (2015). Projections of the Size and Composition of the US Population: 2014 to 2060. Population Estimates and Projections. Current Population Reports. P25-1143. US Census Bureau.
- Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. (1997). Social ties and susceptibility to the common cold. *Jama*, 277(24), 1940-1944.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American journal of sociology*, 94, S95-S120.
- Coleman, E. A., Parry, C., Chalmers, S., & Min, S. J. (2006). The care transitions intervention: results of a randomized controlled trial. *Archives of internal medicine*, 166(17), 1822-1828.
- Cordier, R., Wilson, N. J., Stancliffe, R. J., MacCallum, J., Vaz, S., Buchanan, A., . . . Falkmer, T. S. (2016). Formal intergenerational mentoring at Australian Men's Sheds: a targeted survey about mentees, mentors, programmes and quality. *Health Soc Care Community*, 24(6), e131-e143. doi:10.1111/hsc.12267
- Curran, M. A., Black, M., Depp, C. A., Iglewicz, A., Reichstadt, J., Palinkas, L., & Jeste, D. V. (2015). Perceived barriers and facilitators for an academic career in geriatrics: medical students' perspectives. *Academic Psychiatry*, 39(3), 253-258.
- Cutrona, C. E., & Russell, D. W. (1987). The provisions of social relationships and adaptation to stress. *Advances in personal relationships*, 1(1), 37-67.

- Czaja, S. J., Boot, W. R., Charness, N., Rogers, W. A., & Sharit, J. (2018). Improving social support for older adults through technology: Findings from the PRISM randomized controlled trial. *The Gerontologist*, 58(3), 467-477.
- Dionigi, R.A. (2015). Stereotypes of Aging: Their Effects on the Health of Older Adults. *Journal of Geriatrics*. <https://doi.org/10.1155/2015/954027>.
- Drivsholm, T., Eplov, L. F., Davidsen, M., Jørgensen, T., Ibsen, H., Hollnagel, H., & Borch-Johnsen, K. (2006). Representativeness in population-based studies: a detailed description of non-response in a Danish cohort study. *Scandinavian journal of public health*, 34(6), 623-631.
- Edmonds, E. C., Delano-Wood, L., Clark, L. R., Jak, A. J., Nation, D. A., McDonald, C. R., ... & Bondi, M. W. (2015). Susceptibility of the conventional criteria for mild cognitive impairment to false-positive diagnostic errors. *Alzheimer's & Dementia*, 11(4), 415-424.
- Elo, S., & Kyngäs, H. (2008). The qualitative content analysis process. *Journal of Advanced Nursing*, 62(1), 107-115.
- Erikson, E. H. (1959). *Identity and the life cycle: Selected papers*.
- Espino, D. V., Bedolla, M. A., Perez, M., & Baker, F. M. (1996). Validation of the Geriatric Depression Scale in an elder Mexican American population: a pilot study. *Clinical gerontologist*, 16(4), 55-67.
- Gale, C. R., Westbury, L., & Cooper, C. (2018). Social isolation and loneliness as risk factors for the progression of frailty: the English Longitudinal Study of Ageing. *Age and ageing*, 47(3), 392-397.

- Galinsky, A. D., & Moskowitz, G. B. (2000). Perspective-taking: decreasing stereotype expression, stereotype accessibility, and in-group favoritism. *Journal of personality and social psychology*, 78(4), 708.
- Giles, H., Hajek, C., Stoitsova, T., & Choi, C. W. (2010). Intergenerational communication satisfaction and age boundaries in Bulgaria and the United States. *J Cross Cult Gerontol*, 25(2), 133-147. doi:10.1007/s10823-010-9114-x
- Giles, H., Noels, K. A., Williams, A., Ota, H., Lim, T. S., Ng, S. H., ... & Somera, L. (2003). Intergenerational communication across cultures: Young people's perceptions of conversations with family elders, non-family elders and same-age peers. *Journal of cross-cultural gerontology*, 18(1), 1-32.
- Glaser, B. S., & Strauss, A. (1971). A.(1967). *The discovery of grounded theory*. New york, 581-629.
- Glass, T. A., De Leon, C. F. M., Bassuk, S. S., & Berkman, L. F. (2006). Social engagement and depressive symptoms in late life: longitudinal findings. *Journal of aging and health*, 18(4), 604-628.
- Golden, J., Conroy, R. M., Bruce, I., Denihan, A., Greene, E., Kirby, M., & Lawlor, B. A. (2009). Loneliness, social support networks, mood and wellbeing in community-dwelling elderly. *International Journal of Geriatric Psychiatry: A journal of the psychiatry of late life and allied sciences*, 24(7), 694-700.
- Golden, J., Conroy, R. M., & Lawlor, B. A. (2009). Social support network structure in older people: underlying dimensions and association with psychological and physical health. *Psychology, Health & Medicine*, 14(3), 280-290.

- Golden, A. G., Xu, P., Wan, T. T. H., & Issenberg, S. B. (2016). Estimating the Net Career Income of a Geriatrician and a Nurse Practitioner: Still Want to Be a Doctor? *Southern Medical Journal*, 109(7), 409–414. <http://doi.org/10.14423/SMJ.00000000000000484>
- Green, R. F. , & Martinez, J. N. (1967). Standardization of a Spanish language adult intelligence scale. East Lansing, MI: National Center for Research on Teacher Learning. (ERIC Document Reproduction Service No. ED 013 045)
- Grisham S. (2017) Medscape Physician Compensation Report.
<https://www.medscape.com/slideshow/compensation-2017-overview-6008547?faf=1#4>.
Accessed December 1, 2017.
- Gualano, M. R., Voglino, G., Bert, F., Thomas, R., Camussi, E., & Siliquini, R. (2018). The impact of intergenerational programs on children and older adults: a review. *International psychogeriatrics*, 30(4), 451-468.
- Gutheil, I. A., Chernesky, R. H., & Sherratt, M. L. (2006). Influencing Student Attitudes Toward Older Adults: Results of a Service-Learning Collaboration. *Educational Gerontology*, 32(9), 771-784. doi:10.1080/03601270600835470
- Heo, J., King, C., Lee, J.-w., Kim, H. M., & Ni, C. (2013). Learning from Healthy Older Adults: An Analysis of Undergraduate Students’ Reflective Essays. *The Asia-Pacific Education Researcher*, 23(3), 537-545. doi:10.1007/s40299-013-0128-3
- Higashi, R.T. , Tillack, A. , Steinman, M.A. , Johnston, C.B., & Harper, G.M., (2013): The ‘worthy’ patient: rethinking the ‘hidden curriculum’ in medical education, *Anthropology & Medicine*, 20:1, 13-23

- Hill, A., Brown, J., Horn, E. B., Sterchele, A., Underberg-Goode, N., & Schippert, C. (2018). Once In My LIFE: Behind the Scenes of an Intergenerational Theater Production. *Storytelling, Self, Society*, 14(2), 233-253.
- Hsieh, H. F., & Wang, J. J. (2003). Effect of reminiscence therapy on depression in older adults: a systematic review. *International journal of nursing studies*, 40(4), 335-345.
- Hsu, Y. C., & Wang, J. J. (2009). Physical, affective, and behavioral effects of group reminiscence on depressed institutionalized elders in Taiwan. *Nursing research*, 58(4), 294-299.
- Hughes ME, Waite LJ, Hawley LC, Cacioppo JT (2004) A short scale for measuring loneliness in large surveys. *Res Aging* 26:655–672
- i FORTUNY, L. A., Heaton, R. K., & Hermsillo, D. (1998). Neuropsychological comparisons of Spanish-speaking participants from the US–Mexico border region versus Spain. *Journal of the International Neuropsychological Society*, 4(4), 363-379.
- Jarrott, S. E. (2011). Where have we been and where are we going? Content analysis of evaluation research of intergenerational programs. *Journal of Intergenerational relationships*, 9(1), 37-52.
- Johnson, J., Stewart, A., Acree, M., Nápoles, A., Flatt, J., Max, W., & Gregorich, S. (2018). A Community Choir Intervention to Promote Well-being among Diverse Older Adults: Results from the Community of Voices Trial. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *The journals of gerontology. Series B, Psychological sciences and social sciences*, 09 November 2018.
- Kessler, C., Williams, M. C., Moustoukas, J. N., & Pappas, C. (2013). Transitions of care for the geriatric patient in the emergency department. *Clinics in geriatric medicine*, 29(1), 49-69.

- Keyes, C. L. M. (1998). Social well-being. *Social psychology quarterly*, 121-140.
- Knox, V. J., Gekoski, W. L., & Johnson, E. A. (1986). Contact with and perceptions of the elderly. *The Gerontologist*, 26(3), 309-313.
- Kovner, C. T., Mezey, M., & Harrington, C. (2002). Who cares for older adults? Workforce implications of an aging society. *Health affairs*, 21(5), 78-89.
- Kuehne, V. S. (2003). The state of our art: intergenerational program research and evaluation: part one. *Journal of intergenerational Relationships*, 1(1), 145-161.
- Kuehne, V. S., & Melville, J. (2014). The state of our art: A review of theories used in intergenerational program research (2003–2014) and ways forward. *Journal of Intergenerational Relationships*, 12(4), 317-346.
- LaMascus, A. M., Bernard, M. A., Barry, P., Salerno, J., & Weiss, J. (2005). Bridging the workforce gap for our aging society: how to increase and improve knowledge and training. Report of an expert panel. *Journal of the American Geriatrics Society*, 53(2), 343-347.
- Lamont, R. A., Swift, H. J., & Abrams, D. (2015). A review and meta-analysis of age-based stereotype threat: Negative stereotypes, not facts, do the damage. *Psychology and Aging*, 30(1), 180-193. <http://dx.doi.org/10.1037/a0038586>
- Lasher, K. P., & Faulkender, P. J. (1993). Measurement of aging anxiety: Development of the anxiety about aging scale. *The International Journal of Aging and Human Development*, 37(4), 247-259.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge university press.

- Lawton, M. P. (1975). The Philadelphia geriatric center morale scale: A revision. *Journal of gerontology*, 30(1), 85-89.
- Leary, M. R., & Kowalski, R. M. (1990). Impression management: A literature review and two-component model. *Psychological bulletin*, 107(1), 34.
- Lemaire, P., Brun, F., & Régner, I. (2018). Negative Aging Stereotypes Disrupt both the Selection and Execution of Strategies in Older Adults. *Gerontology*.
- Levy, B. R., Hausdorff, J. M., Hencke, R., & Wei, J. Y. (2000). Reducing cardiovascular stress with positive self-stereotypes of aging. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 55(4), P205-P213.
- Levy, S. R., & Macdonald, J. L. (2016). Progress on understanding ageism. *Journal of Social Issues*, 72(1), 5-25.
- Levy, B. R., Zonderman, A. B., Slade, M. D., & Ferrucci, L. (2009). Age stereotypes held earlier in life predict cardiovascular events in later life. *Psychological Science*, 20(3), 296-298.
- Levy, B. R., Slade, M. D., Kunkel, S. R., & Kasl, S. V. (2002). Longevity increased by positive self-perceptions of aging. *Journal of personality and social psychology*, 83(2), 261.
- Lezak M. (2004). *Neuropsychological Assessment*. ed 4. New York: Oxford University Press.
- Liang, J., & Bollen, K. A. (1983). The structure of the Philadelphia Geriatric Center Morale scale: A reinterpretation. *Journal of Gerontology*, 38(2), 181-189.
- Ligon, M., Ehlman, K., Moriello, G., & Welleford, E. A. (2009). Oral history in the classroom: Fostering positive attitudes toward older adults and the aging process. *Journal of Aging, Humanities, and the Arts*, 3(1), 59-72.

- Lubben , J. , & Gironda , M. (1996). Assessing social support networks among older people in the United States . In H. Litwin (Ed.), *The social networks of older people: A cross-national analysis* . London : Praeger .
- Martins, T., Midão, L., Martínez Veiga, S., Dequech, L., Busse, G., Bertram, M., ... & Costa, E. (2019). Intergenerational programs review: Study design and characteristics of intervention, outcomes, and effectiveness. *Journal of Intergenerational Relationships*, 17(1), 93-109.
- Medical Group Management Association. *Physician Compensation and Production Survey, 2011 Report Based on 2010 Data*. Englewood, CO: Medical Group Management Association; 2011.
- Meiboom, A. A., de Vries, H., Hertogh, C. M., & Scheele, F. (2015). Why medical students do not choose a career in geriatrics: a systematic review. *BMC medical education*, 15(1), 101.
- Miyake, A., Friedman, N. P., Emerson, M. J., Witzki, A. H., Howerter, A., & Wager, T. D. (2000). The unity and diversity of executive functions and their contributions to complex “frontal lobe” tasks: A latent variable analysis. *Cognitive psychology*, 41(1), 49-100.
- Molpeceres, M. A. (2012). Older adult mentors and youth at risk: Challenges for intergenerational mentoring programs in family-centered cultures. *Journal of Intergenerational Relationships*, 10(3), 261-276.
- Myhre, J. W., Mehl, M. R., & Glisky, E. L. (2016). Cognitive benefits of online social networking for healthy older adults. *The Journals of Gerontology: Series B*, 72(5), 752-760.

- Nasreddine, Z. S., Phillips, N. A., Bédirian, V., Charbonneau, S., Whitehead, V., Collin, I., ... & Chertkow, H. (2005). The Montreal Cognitive Assessment, MoCA: a brief screening tool for mild cognitive impairment. *Journal of the American Geriatrics Society*, 53(4), 695-699.
- National Resident Matching Program, Results and Data: 2020 Main Residency Match®.
National Resident Matching Program, Washington, DC. 2020.
- Neergaard, M. A., Olesen, F., Andersen, R. S., & Sondergaard, J. (2009). Qualitative description—the poor cousin of health research?. *BMC medical research methodology*, 9(1), 52.
- Nemmers, T. M. (2005). The influence of ageism and ageist stereotypes on the elderly. *Physical & Occupational Therapy in Geriatrics*, 22(4), 11-20.
- Oh, S. Y., Bailenson, J., Weisz, E., & Zaki, J. (2016). Virtually old: Embodied perspective taking and the reduction of ageism under threat. *Computers in Human Behavior*, 60, 398-410.
- O'Leary, E., & Barry, N. (1998). Reminiscence therapy with older adults. *Journal of Social Work Practice*, 12(2), 159-165.
- Park, D. C., Gutchess, A. H., Meade, M. L., & Stine-Morrow, E. A. (2007). Improving cognitive function in older adults: Nontraditional approaches. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, 62(Special_Issue_1), 45-52.
- Park, D. C., Lodi-Smith, J., Drew, L., Haber, S., Hebrank, A., Bischof, G. N., & Aamodt, W. (2014). The impact of sustained engagement on cognitive function in older adults: the synapse project. *Psychological science*, 25(1), 103-112.
- Parmelee, P. A., & Katz, I. R. (1990). Geriatric depression scale. *Journal of the American Geriatrics Society*.

- Penninkilampi, R., Casey, A. N., Singh, M. F., & Brodaty, H. (2018). The association between social engagement, loneliness, and risk of dementia: a systematic review and meta-analysis. *Journal of Alzheimer's Disease*, 66(4), 1619-1633.
- Peterat, L., & Mayersmith, J. (2006). Farm friends: Exploring intergenerational environmental learning. *Journal of Intergenerational Relationships*, 4(1), 107-116.
- Pettigrew, T. F. (1998). Intergroup contact theory. *Annual review of psychology*, 49(1), 65-85.
- Pietrzak, R. H., Zhu, Y., Slade, M. D., Qi, Q., Krystal, J. H., Southwick, S. M., & Levy, B. R. (2016). Association between negative age stereotypes and accelerated cellular aging: Evidence from two cohorts of older adults. *Journal of the American Geriatrics Society*, 64(11), e228-e230.
- Pikhartova, J., Bowling, A., & Victor, C. (2016). Is loneliness in later life a self-fulfilling prophecy? *Aging & Mental Health*, 20(5), 543–549.
<http://doi.org/10.1080/13607863.2015.1023767>
- Pinquart, M., & Forstmeier, S. (2012). Effects of reminiscence interventions on psychosocial outcomes: A meta-analysis. *Aging & mental health*, 16(5), 541-558.
- Pitkala, K. H., Routasalo, P., Kautiainen, H., Sintonen, H., & Tilvis, R. S. (2011). Effects of socially stimulating group intervention on lonely, older people's cognition: a randomized, controlled trial. *The American Journal of Geriatric Psychiatry*, 19(7), 654-663.
- Popham, L. E., Kennison, S. M., & Bradley, K. I. (2011). Ageism, sensation-seeking, and risk-taking behavior in young adults. *Current psychology*, 30(2), 184.
- Portman, T. A. A., Bartlett, J. R., & Carlson, L. A. (2010). Relational theory and intergenerational connectedness: A qualitative study. *Adultspan Journal*, 9(2), 88-102.

- Powers, M., Gray, M., & Garver, K. (2013). Attitudes toward older adults: Results from a fitness-based intergenerational learning experience. *Journal of Intergenerational Relationships*, 11(1), 50-61.
- Reitan, R. M., & Wolfson, D. (1985). The Halstead-Reitan neuropsychological test battery: Theory and clinical interpretation (Vol. 4). *Reitan Neuropsychology*.
- Richeson, J. A., & Shelton, J. N. (2006). A social psychological perspective on the stigmatization of older adults. *When I'm*, 64, 174-208.
- Rossetti, H. C., Lacritz, L. H., Cullum, C. M., & Weiner, M. F. (2011). Normative data for the Montreal Cognitive Assessment (MoCA) in a population-based sample. *Neurology*, 77(13), 1272-1275.
- Rowe, J. W., Fulmer, T., & Fried, L. (2016). Preparing for better health and health care for an aging population. *Jama*, 316(16), 1643-1644.
- Russell, D. W. (1996). UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of personality assessment*, 66(1), 20-40.
- Sandelowski, M. (2000). Whatever happened to qualitative description?. *Research in nursing & health*, 23(4), 334-340.
- Schwartz, L.K. & Simmons, J.P. (2001). Contact quality and attitudes toward the elderly. *Educational gerontology*, 27(2), 127-137.
- Shankar, A., McMunn, A., Demakakos, P., Hamer, M., & Steptoe, A. (2017). Social isolation and loneliness: Prospective associations with functional status in older adults. *Health psychology*, 36(2), 179.

- Sharifian, N., & Grünh, D. (2019). The differential impact of social participation and social support on psychological well-being: Evidence from the Wisconsin longitudinal study. *The International Journal of Aging and Human Development*, 88(2), 107-126.
- Sherbourne, C. D., & Stewart, A. L. (1991). The MOS social support survey. *Social science & medicine*, 32(6), 705-714.
- Steele, C. M., & Aronson, J. (1995). Stereotype threat and the intellectual test performance of African Americans. *Journal of personality and social psychology*, 69(5), 797.
- Strauss, A., & Corbin, J. (1994). Grounded theory methodology. *Handbook of qualitative research*, 17, 273-85.
- Taylor, H. O., Taylor, R. J., Nguyen, A. W., & Chatters, L. (2018). Social isolation, depression, and psychological distress among older adults. *Journal of aging and health*, 30(2), 229-246.
- Taussig, I. M., Henderson, V. W., & Mack, W. (1992). Spanish translation and validation of a neuropsychological battery: Performance of Spanish-and English-speaking Alzheimer's disease patients and normal comparison subjects. *Clinical Gerontologist*, 11(3-4), 95-108.
- Thomas, P. A. (2011). Trajectories of social engagement and limitations in late life. *Journal of Health and Social Behavior*, 52(4), 430-443.
- U.S. Department of Health and Human Services, Health Resources and Services Administration, National Center for Health Workforce Analysis. 2017. National and Regional Projections of Supply and Demand for Geriatricians: 2013-2025.
- Valtorta, N. K., Kanaan, M., Gilbody, S., & Hanratty, B. (2016). Loneliness, social isolation and social relationships: what are we measuring? A novel framework for classifying and comparing tools. *BMJ open*, 6(4), e010799.

- Vaportzis, E., Niechcial, M. A., & Gow, A. J. (2019). A systematic literature review and meta-analysis of real-world interventions for cognitive ageing in healthy older adults. *Ageing research reviews*.
- Vincent, G. K., & Velkoff, V. A. (2010). *The next four decades: The older population in the United States: 2010 to 2050* (No. 1138). US Department of Commerce, Economics and Statistics Administration, US Census Bureau.
- Weeks WB, Wallace AE. (2004). Return on educational investment in geriatrics training. *J Am Geriatr Soc*. 52(11):1940-1945.
- Wechsler, D. (1997). *Wechsler memory scale (WMS-III)* (Vol. 14). San Antonio, TX: Psychological corporation.
- Wechsler, D. (2008a). *Wechsler Adult Intelligence Scale–Fourth Edition (WAIS–IV)*. San Antonio, TX: The Psychological Corporation.
- Wechsler, D. (2008b). *Wechsler memory scale (WMS-IV)*. San Antonio, TX: The Psychological Corporation.
- Wendler, D., Kington, R., Madans, J., Van Wye, G., Christ-Schmidt, H., Pratt, L. A., ... & Emanuel, E. (2005). Are racial and ethnic minorities less willing to participate in health research?. *PLoS Med*, 3(2), e19.
- Wilson, N. J., Cordier, R., Ciccarelli, M., MacCallum, J., Milbourn, B., Vaz, S., . . . Stancliffe, R. J. (2017). Intergenerational mentoring at Men's Sheds: A feasibility study. *J Appl Res Intellect Disabil*. doi:10.1111/jar.12338
- Wong, J. T., Gallo, D. A., & Knight, B. G. (2018). Activating Aging Stereotypes Increases Source Recollection Confusions in Older Adults: Effect at Encoding but Not Retrieval. *The Journals of Gerontology: Series B*.

Woods, R. T., Bruce, E., Edwards, R. T., Hounsome, B., Keady, J., Moniz-Cook, E. D., ... & Russell, I. T. (2009). Reminiscence groups for people with dementia and their family careers: pragmatic eight-center randomized trial of joint reminiscence and maintenance versus usual treatment: a protocol. *Trials*, 10(1), 64.