Ageism, empathy, attitudes, and aging anxiety: An evaluation of the Gray for a Day program
with college students

by

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B.S., Kansas State University, 2018

A THESIS

submitted in partial fulfillment of the requirements for the degree

MASTER OF SCIENCE

Department of Family Studies and Human Services
College of Health and Human Sciences

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Manhattan, Kansas

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Abstract

Studies have shown ageism, empathy, attitudes toward older adults and aging anxiety to be important factors for not only individuals planning to work with older adults, but for all individuals to be able to age healthfully. Increased levels of empathy are associated with decreased levels of ageism and knowledge of the aging process promotes more positive attitudes towards aging and decreased aging anxiety. Aging simulations have been created to increase empathy, improve attitudes toward older adults, and decrease ageism and aging anxiety, but there are still mixed results when evaluating these programs. This study utilized Kolb's experiential learning theory to understand the ways in which participation in the Gray for a Day program, an educational program about sensory and functional decline in older adults, impacts ageism, empathy, attitudes toward older adults and aging anxiety by evaluating the Gray for a Day program with students in an introduction to human development course at a Midwestern university. Changes in ageism, empathy, attitudes toward older adults and aging anxiety after participation in Gray for a Day were assessed using paired samples t-tests. Results showed that participation in Gray for a Day significantly increased positive attitudes towards older adults and the level of understanding and positive perceptions of older adult experiences among participants. Other measures showed decreases in ageism, empathy, and aging anxiety following participation in the program, but the differences were not statistically significant. Results indicate that the Gray for a Day program is effective at improving attitudes toward older adults and increasing understanding and positive perceptions of older adult experiences, but further evaluation and possible program adjustments are needed to reassess for ageism, empathy, and aging anxiety outcomes from the program.

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Chapter 1 - Introduction

The population of individuals aged 65 and older is expected to grow from 15 percent of the United States population in 2014 to 24 percent by the year 2060. With the rise in older adults, the proportion of the 64 years and under populations are shrinking, leading to the projection that one in five Americans will be 65 and over by the year 2030 (Colby & Ortman, 2015). With the increased proportion of older adults, and the fact that everyone is aging, it is important to understand key concepts around aging. Ageism, empathy, attitudes toward older adults and aging anxiety all play a role in how older adults experience life and individuals experience aging (Boudjemad & Gana, 2009; Laditka et al., 2004; Levy & Myers, 2004; Levy et al., 2002).

Over the past few decades, several aging simulation games have been developed and implemented with students in various fields as a way to educate individuals about aging (Hoffman et al., 1985; Mcvey et al., 1989; Menks, 1983). Utilizing aging simulation games with students in geriatrics and health and human service fields is both an effective and meaningful strategy because age-related experiences can enhance students' empathy toward older adults, improve attitudes toward older adults, and raise awareness and understanding of aging (Gardner & Benzing, 1990; Hoffman et al., 1985; Pacala et al., 2006). Unfortunately, it can also worsen attitudes towards one's own aging (Lucchetti et al., 2017) and create negative views of providing care towards older adults (Pacala et al., 2006).

The purpose of this study was to evaluate the use of an educational experience – Gray for a Day – which simulates functional health declines that older adults may experience, with a variety of undergraduate students all taking an introduction to human development course at a Midwestern university. This study aimed to answer the following question: How does the Gray

for a Day program affect students' ageism, empathy, attitudes toward older adults, and aging

anxiety?

Chapter 2 - Literature Review

Research has shown the importance of individuals understanding the aging process to lower levels of ageism, increase levels of empathy, improve attitudes toward older adults, and decrease aging anxiety. These findings have heightened interest in utilizing interventions developed to decrease ageism and aging anxiety and improve empathy and attitudes toward older adults (Chang et al., 2020; Davis 2009; Eymard & Douglas, 2012; Goncalves et al., 2011; Levy & Myers, 2004). Kolb's experiential learning theory was developed with the idea that learning is a process that occurs from experiences, reflection, forming new concepts and ideas, and then experimentation using the new concepts (Kolb, 2014). Learning techniques utilizing simulation follow experiential learning theory because they provide the learner with a base experience. There are a number of different interventions that have been developed for these purposes, most commonly with students in different medical fields (Foster et al., 2017).

Utilizing Kolb's experiential learning theory provides a basis for understanding the ways simulated interventions create opportunities for participants to have new experiences and build new ideas and concepts to utilize while interacting with older adults as well as practicing steps to improve or maintain their own sensory and functional well-being in the future (Kolb, 2014). Understanding the components of ageism, empathy, attitudes towards older adults, and aging anxiety and how these concepts are formed within individuals has informed the use of the Gray for a Day program with college students.

Theoretical Framework

Educational interventions that incorporate simulation experiences are supported by Kolb's learning theory because of their use of experiential and active learning techniques. Experiential learning emphasizes the link between classroom settings and the real world (Kolb,

2014). Kolb's experiential learning theory is a model that offers a framework for understanding learning which happens through a cyclical process of four components: (1) concrete experience – open participation in new experiences (2) reflective observation – reflection and observation of experiences through multiple perspectives to build your own perception (3) abstract conceptualization – build ideas and theories by integration of new observations, and (4) active experimentation – using new ideas to adjust behaviors. Kolb (2014) defines learning as "the process whereby knowledge is created through the transformation of experience," (p. 49). Kolb's experiential learning theory is holistic in that it combines experience, perception, cognition, and behavior through the four processes to understand learning (Kolb, 2014).

The first process is concrete experience. Concrete experience is a key piece of Kolb's experiential learning theory because it sets the stage for all further processes. The learner must be open to fully participate in the experience to be able to partake in the learning process (Kolb, 2014). Kolb (2014) states that learning happens when ideas are formed and re-formed through experience. Observation and reflection represent the next component, allowing for the assimilation of the knowledge gained from the experience. To aid in the learning process, educational programs aimed at adult learners should allow for time for observation and reflection on experiences to allow the learner to think through the experience from many perspectives (Kolb, 2014). During the third component of the learning theory, abstract conceptualization, individuals begin to critically reflect on the experience by relating the new experience to previous experiences (Kolb, 1984). This gives learners the opportunity to critically think and adjust the way they perceive the concepts being learned. The final component of the Kolb learning cycle is active experimentation. Active experimentation provides time for the learner to practice newly learned behaviors. Allowing learners to practice using their new knowledge and

understanding is an important step in the learning process (Kolb, 2014). Utilizing experience as a key component of learning, aging games that incorporate simulated experiences have become a popular way to educate about aging.

Aging Games

Results from aging game interventions have been mixed. Interventions using The Game of Late Life, a board game that leads students to imagine life during ages 65 to death, was used with first year psychology students and the Geriatric Medication Game was used with first year pharmacy students; both led to improvements in attitudes towards aging (Brinker et al., 2014; Chen et al., 2015) and decreases in anxiety about aging among students (Brinker et al., 2014). Chen et al. (2015) also found improvements in empathy and perceptions of older adult experiences through the use of the Geriatric Medication Game.

Various types of medical students participating in the Aging Game, another simulated experience of various impairments that older adults might experience, all showed increased levels of empathy (Henry et al., 2011; Lucchetti et al., 2017; Varkey et al., 2006), improved attitudes toward caring for the older adult population (Varkey et al., 2006), and a better understanding of the aging process (Henry et al., 2011). However, in another study utilizing the Aging Game, results showed improved empathy toward older adults, but worsened attitudes towards aging. The authors hypothesized that attitudes worsened among students participating in the Aging Game because it was introduced early in a geriatrics course before students had knowledge on aging and therefore heightened students' already negative stereotypes (Lucchetti et al., 2017). In a ten-year study of the Aging Game, common themes of strengths identified by the participants were the method of learning, changes in attitudes, educational value, and effect of the game. The weaknesses addressed included that there was not enough time for discussion

following simulations, lack of handouts with the lesson, boredom, and experiences of negative views of caring for older adults (Pacala et al., 2006).

In the following sections, the constructs that have been used to determine the effectiveness of similar interventions, and consequently the constructs that are being used in the current study, will be discussed. Those constructs include ageism, empathy, attitudes toward older adults and aging anxiety.

Ageism

Ageism is defined by the World Health Organization (2015) as "stereotyping of and discrimination against individuals or groups based on their age" (p. 11). There are three predictors of ageism: age discrimination, negative age stereotypes, and negative self-perceptions about aging (Levy et al., 2020). According to Levy et al. (2020), beliefs on aging are passed down culturally and through observation of how older adults are treated. Though only a few studies have estimated the prevalence of ageism, these studies indicate that ageism is an almost universal phenomenon and is most common among younger adults (Wilson et al., 2019).

Ageist views and behaviors of young adults affect their treatment and interactions with older adults. Ageism is prevalent in all aspects of daily lives, such as in media, healthcare, education, and the workplace (King & Bryant, 2017; Malinen & Johnston, 2013; Powell, 2010). For example, older adults receive fewer interview opportunities, are less likely to by hired or promoted, and are disadvantaged during career transitioning. Ageism has also been found to be prevalent among health care workers and within long-term care facilities, resulting in higher potential for neglect to occur (Band-Winterstein, 2015; Eymard & Douglas, 2012).

A systematic literature review found that 95% of the 422 studies they reviewed indicated ageism resulted in significantly worse health outcomes for older adults (Chang et al., 2020). The

experience of ageism was found to have a strong negative effect on mental health especially among men (Lyons et al., 2017). The negative effect on mental health seems to decrease, however, as older adults grow even older, which may be due to either experiencing differing forms of ageism or generational differences (Lyons et al., 2017). Notably, several longitudinal studies have found that people holding negative age stereotypes earlier in life are more likely to have negative health outcomes in their old age, such as experiencing cardiovascular events or showing Alzheimer's biomarkers (Levy, Ferrucci et al., 2016; Levy, Moffat et al., 2016; Levy & Myers, 2004; Levy et al., 2009).

Empathy

Empathy has been defined as a way of relating to other individuals through understanding the mental content, both cognitive and emotional, of the other person (Dal Santo et al., 2014). Empathy is comprised of two components: cognitive and affective (Davis, 2009; Dal Santo et al., 2014). The cognitive component of empathy is the knowledge of and ability to understand another individual's experience, feelings, and perspectives (Duarte et al., 2016; Davis, 2009; Dal Santo et al., 2014; Finn et al., 2018). The affective component of empathy allows people the ability to convey their understanding through relating to the experiences of another individual (Davis, 2009). Empathy is developed from one's ability to imagine what another is experiencing (Davis, 2009). When individuals lack relatable experiences, empathetic behaviors can be difficult to learn and display (Ward et al., 2012), however, experience is a valuable way to build empathy (Davis, 2009).

Empathy is an important component when studying aging and ageism, because empathy is negatively associated with ageism, meaning the more empathy one has, the less ageist tendencies he or she will display (Boudjemad & Gana, 2009). Empathy is also an essential part

of quality health care for older adults (Lamberton et al., 2015; Sorrell, 2010). Taking an empathetic approach while providing care may improve the quality of the provider-patient relationship, and in-turn improve the effectiveness of treatment (Davis 2009). Schell and Kayser-Jones (2007) explored empathy skills among certified nursing assistants caring for dying residents and emphasized the importance of empathy training within long term care facilities. Not only is empathy important for individuals working within long term care, but also other avenues of care provided to older adults. Waldrop et al. (2016) found that dental students with a higher level of empathy tend to show more acceptability of aging, and that greater exposure to older adults is associated with a higher level of empathy. Empathy has shown to be a beneficial skill for all individuals interacting with older adults (Davis, 2009; Lamberton et al., 2015; Schell & Kayser-Jones, 2007; Sorrell, 2010; Waldrop et al., 2016). Higher levels of empathy resulted in decreases in ageist behaviors (Boudjemad & Gana, 2009), and can be improved through interventions that include relatable experiences (Davis, 2009; Ward et al., 2012).

Attitudes toward Older Adults

Slightly different than empathy, attitudes are mental or emotional positions that individuals hold that can influence individuals' behavior (Bryant et al., 2012). Attitudes toward older adults can vary with age, and studies examining people's attitudes towards older adults have mixed findings (Mansfield-Gree et al., 2015). Laditka et al. (2004) found younger and middle-aged participants have less positive views toward older adults than older participants. However, others have found both younger and older participants tend to hold similar and positive attitudes towards older adults (Chasteen et al., 2002).

A review of studies on nurses, nursing students, medical students, and direct care workers found that each type of health care worker exhibited negative attitudes towards older adults

(Eymard & Douglas, 2012). Not only are negative attitudes found among those working within health care and long-term care facilities (Eymard & Douglas, 2012), but also among students preparing to work in professions that often serve older adults (Eskildsen, & Flacker, 2009; Goncalves et al., 2011; Holroyd et al., 2009). Studies with undergraduate nursing students have found that students with experience with older adults had improved attitudes toward older adults (Holroyd et al., 2009) and that interaction with experts, knowledge of normative age changes, and contact with healthy and impaired older adults promote positive attitudes toward older adults (Goncalves et al., 2011).

Aging Anxiety

People's aging stereotypes and attitudes towards older adults can start emerging early in life, then gradually be internalized and become feelings towards one's own aging (Davis & Friedrich, 2010). Aging anxiety was defined by Lynch (2000) as the "combination of people's concerns or fears about getting older," (p. 533). Aging anxiety has been found to be prevalent and intense among all adults (Brunton & Scott, 2015). Young adults' aging anxiety may result from a fear of the unknown, especially related to death, and older adults tend to have more fears about health and finances (Barnett & Adams, 2018; Lynch, 2000). Studies found that young adults that lack factual knowledge about aging and the aging process, or lack quality interactions with older adults tend to have a higher level of aging anxiety (Prior & Sargent-Cox, 2014). However, another study indicated that undergraduates who resided with elderly relatives had higher levels of aging anxiety (Allan & Johnson, 2009). Brunton and Scott (2015) explored aging anxiety among age groups from 18 to 88 years old and found that individuals that had higher quality of social contact with work, family, or community and more positive attitudes toward

aging were more likely to have less aging anxiety, whereas poor health was associated with greater aging anxiety.

Some researchers found that increased age in participants was related to more negative perceptions of one's own aging (Jung & Siedlecki, 2018). Others noted that compared with younger and middle-aged participants, older participants had more positive attitudes towards their own aging (Laditka et al., 2004). Longitudinal studies have demonstrated that individuals with more positive attitudes towards their own aging not only tend to practice more preventative health behaviors over a 20-year period (Levy & Myers, 2004), but also report better functional health during the next 18 years (Levy et al., 2002).

Gray for a Day Overview

Gray for a Day is a peer-reviewed and research-based Cooperative Extension program that was developed at a Midwestern university. This non-formal, educational program was created to teach participants about age-related sensory and functional declines. The program consists of a short lecture, which provides participants with base knowledge on age-related sensory and functional declines and simulation activities, and simulation activities. The activities allow participants to use various materials to "get gray" and simulate sensory and functional challenges which older adults may experience (Yelland & Piper, 2019).

The program was designed for participants to: (a) gain an understanding of ways that sensory and functional abilities may decline with age, (b) utilize simulation to experience these age-related sensory and functional declines, (c) understand the impact these declines may have on daily life, (d) gain foundational knowledge to develop skills necessary for interactions with individuals experiencing age-related sensory and functional declines, and (e) understand how one

can take steps to improve or maintain one's sensory and functional well-being in the future (Yelland & Piper, 2019).

Following Kolb's experiential learning theory, Gray for a Day provides the opportunity for participants to experience health declines that older adults may face through engaging simulations (Yelland & Piper, 2019), with the intention for the participants to have a better understanding of sensory and functional challenges that some older adults may face daily. Feelings that the participants may experience during the simulation might enhance the quality of the educational experience because experiences are more profound when they are emotionally charged (Zigmont et al., 2011). Gray for Day meets the second component of Kolb's experiential learning theory of observation and reflection by having participants watch other participants attempt to complete the same tasks and includes time for participants to reflect on their experiences with the simulated tasks (Yelland & Piper, 2019). The participants are expected to use their simulated experience with Gray for a Day with the third component of Kolb's experiential learning theory, abstract conceptualization, to connect to previous experiences with older adults with their simulated experiences to create new ideas and concepts and have an overall better understanding of older adult experiences. This happens through discussion following the simulation including questions such as "How can you better interact with a person who might be facing age-related sensory and functional decline?" The final process of active experimentation can take place during interactions with older adults in the students' everyday lives. From their experiences with Gray for a Day, participants will ideally be able to appropriately reassess situations while interacting with older adults.

Simple post-participation evaluation results have shown that Gray for a Day has met the program objectives including an increase in participant understanding of how sensory and

functional abilities may decline with age and awareness of the impact that these declines may have on daily life. Participants also indicated a better understanding of the connection between current health and future sensory and function wellbeing. Results also showed an increased understanding in better ways to interact with and support older adults. A qualitative analysis with adults indicated an increase in knowledge and empathy. Adults also mentioned an appreciation of their current health statuses as well as a better understanding of preventative care (Yelland & Piper, 2020). The present study seeks to build upon these findings by going beyond understanding if program objectives were met and what participants learned to measure how the constructs of ageism, empathy, attitudes towards older adults, and aging anxiety change through participation in the program.

Present Study

Research emphasizes the importance of education and knowledge in decreasing ageism, improving empathy and attitudes towards older adults and aging anxiety. Improving these components is important for individuals, especially during interactions with older adults and for individuals to improve their own aging experience. Interventions focused on attitudes towards aging may be one way of improving health of adults of all ages (Jung & Siedlecki, 2018). Having experiences that are relatable to the experiences of older adults, is one way empathy can be increased (Davis, 2009) and these higher levels of empathy are associated with lower levels of ageism (Boudjemad & Gana, 2009). Experience and knowledge about normative age changes that can come from aging simulation interventions promote positive attitudes towards older adults (Goncalves et al., 2011) and decrease anxiety about one's own aging (Prior & Sargent-Cox, 2014). Following Kolb's experiential learning theory, this study examined if the Gray for a Day program affected measures of ageism, empathy, attitudes towards older adults, and aging

anxiety among undergraduate students in an introduction to human development course at a

Midwestern university.

Chapter 3 - Methods

Procedure

Undergraduate students enrolled in an introductory human development course during the Spring and Fall 2019 semesters at a Midwestern university participated in the Gray for a Day program as a part of the course curriculum. All enrolled students were asked to complete both pre- and post-surveys via an online survey platform. The link to the pre-survey was sent out in an email to all enrolled students by the course instructor approximately seven days prior to participation in the program. The post-survey was emailed to all enrolled students immediately after the Gray for a Day program was completed in class; students who did not participate in the program were asked not to complete the survey. The post-survey remained open and students completed the post-survey within two weeks of their participation in the program.

Sample

Of the 599 students that were enrolled in the course, a total of 413 participants completed a pre-survey, 230 participants completed a post-survey, and 142 participants completed both the pre- and post-surveys. In order for pre-post effects to be determined, only those participants who completed both the pre- and post-surveys were included in this analysis. After running preliminary descriptive analyses, an additional 19 cases were deleted for failure to complete all primary measures, resulting in a total of 123 participants. Of the final sample, participant birth year ranged from 1996 to 2001 ($M = 1999.3$, $SD = 1.2$), equating an approximate age range of 18 to 23 ($M = 20.7$). The majority of participants identified as female (86.2%, $n = 106$), White (91.1%, $n = 112$), being a freshman (59.3%, $n = 73$), and having a close relationship with an older adult (75.6%, $n = 93$). Most participants had not taken and did not plan to take a gerontology course in the future (71.5%, $n = 88$), but 13.8% ($n = 17$) had taken a gerontology

course and 14.6% (*n* = 18) planned to take a gerontology course in the future. Interest in working

with older adults as part of participant's future careers varied with 40.6% (*n* = 50) strongly or

somewhat agreeing that they had an interest in working with older adults, 30.1% (n = 37) neither

agreeing or disagreeing, and 29.3% (*n* = 36) strongly or somewhat disagreeing (*M* =2.9, *SD* =

1.1). Complete descriptive statistics can be found in Table 1.

Table 1

Descriptive Statistics of Demographics (N = 123)

Characteristic	%	n
Age (18 – 23; *M* = 20.7, *SD* = 1.2)		
Close relationship with an older adult (1 – 4; *M* = 1.3, *SD* = 0.6)		
Interest in working with older adults (1 – 5; *M* = 2.9, *SD* = 1.2)		
Sex		
Female	86.2	106
Male	13.8	17
Race		
Asian or Asian American	0.8	1
Black or African American	0.8	1
European	0.8	1
Hispanic or Latino	1.6	2
Middle Eastern or North African	0.8	1
White or Caucasian	91.1	112
Multiracial	3.3	4
Decline to state	0.8	1
Class Level		
Freshman	59.3	73
Sophomore	22.0	27
Junior	11.4	14
Senior	6.5	8
Graduate Student	0	0
Unsure	0.8	1
Taken Course on Older Adults		
Yes	13.8	17
No	71.5	88
No, but plan to in the future	14.6	18

Measures

To assess changes in ageism, empathy, attitudes toward older adults, aging anxiety, and behavioral intention following participation in Gray for a Day participants completed both a pre-survey prior to participation and a post-survey after participation. In both surveys, participants were asked to create a unique participant ID (the last 4 digits of their cell phone number and the day of the month of their birthday) for tracking and pairing purposes. Demographics – including year of birth, biological sex, racial and ethnic identity, class level, enrollment or completion in a gerontology course, close relationship with an older adult, and interest in working with older adults – were gathered in the pre-survey. The post-survey included the addition of the Gray for a Day Experience questions. A complete list of utilized measures is provided in Table 2 and described below.

Table 2

Descriptive Statistics of Primary Measures (n = 123)

Measure	Pre-Survey					Post-Survey				
	Min.	Max.	Mean	SD	α	Min.	Max.	Mean	SD	α
Ageism	0.00	18.00	3.10	2.78	.71	0.00	15.00	3.07	3.00	.75
Empathy	2.81	5.00	4.17	.46	.86	2.69	5.00	4.13	.51	.89
Attitudes	27.00	110.00	64.76	19.61	.94	24.00	91.00	60.76	22.13	.97
Aging Anxiety	1.35	3.90	2.53	.51	.83	1.25	3.45	2.48	.45	.73
Perceptions	2.60	4.00	3.28	.33	.79	2.67	4.00	3.37	.37	.90

Ageism

Ageism, including antagonistic, discriminatory attitudes and the tendency toward avoidance, was measured using a revised Fraboni Scale of Ageism (RFSA; Fraboni et al., 1990), a 23-item (1) *true* or (0) *false* scale. Samples items include "many old people just live in the past" and "most old people are interesting, individualistic people." Items 16, 19, 20, 21, and 22 were reverse coded so that the item indicated a more ageist point of view. Scores on the 23

indicators were summed to create an observed variable of ageism for both before and after the intervention so that a higher number of *true* responses indicated higher levels of ageism.

Empathy

The Toronto Empathy Questionnaire (TEQ; Spreng et al., 2009) was used to assess empathy. The questionnaire is a 16-item, 5-point scale from (1) *never* to (5) *always*. Sample items include "I enjoy making other people feel better" and "I become irritated when someone cries." Seven negatively worded items (2, 4, 7, 10, 11, 14, and 15) were reverse coded so that higher scores indicated a higher level of empathy. The TEQ has exhibited good internal consistency and high test-retest reliability in previous studies ($\alpha = 0.85$; Spreng et al., 2009). Cronbach's alpha of the scale for the pre-survey was $\alpha = 0.86$ ($M = 4.17$, $SD = .46$). In the post-survey, reliability scores were $\alpha = 0.89$ ($M = 4.13$, $SD = .51$). These items were averaged to create composite variables for pre- and post-intervention empathy.

Attitudes toward Older Adults

The Refined Aging Semantic Differential (RASD; Polizzi, 2003) was used to measure attitudes toward older adults using a list of 24 polar opposite adjective pairs on a 7-point scale (1 = most positive, 4 = neutral, and 7 = most negative). Sample adjectives include "cheerful or crabby," "nice or mean," and "calm or agitated." Participants were asked to select the point on the scale between the two adjectives which best represented their first-impression judgement about older adults. One item was reverse coded (frugal or generous), so that all positive items were on the left (closest to 1) and negative items were on the right (closest to 7). Thus, higher scores indicate a worse attitude towards adults. All 24-items are then summed for a total range of scores being 24 – 168 (Polizzi & Millikin, 2002). The pre-survey reliability was $\alpha = 0.94$ ($M = 64.76$, $SD = 19.61$) and in the post-survey, $\alpha = 0.97$ ($M = 60.76$, $SD = 22.13$).

Aging Anxiety

Aging anxiety was measured using the Aging Anxiety Scale (AAS; Lasher & Faulkender, 1993). The AAS is a 20-item scale with responses ranging from (1) *strongly disagree* to (5) *strongly agree*. Sample items include "I fear it will be very hard to me to find contentment in old age" and "it doesn't bother me at all to imagine myself as being old." Items 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, and 15 were reverse coded so that higher scores indicated a higher level of aging anxiety. Cronbach alpha for the AAS in the pre-survey was $\alpha = 0.83$ ($M = 2.53$, $SD = .51$) and the post-survey had a Cronbach alpha of $\alpha = 0.78$ ($M = 2.48$, $SD = .45$). The items were averaged to create a composite score for aging anxiety for both the pre- and post-survey.

Perceptions of Older Adult Experiences

The Aging Simulation Experience and Empathy scale, totaling 15 items, included selected items from the Aging Simulation Experience Survey (ASES; Chen et al., 2015), a 13-item quantitative survey to assess participant's perceptions of older adult experiences and two relevant questions from an empathy scale. Sample items included "I plan to be patient with older adults in my daily life," or "people treat older adults differently because of their age." Items were scored on a 4-point scale (1) *strongly disagree* to (4) *strongly agree*. Higher scores indicated a higher level of understanding, empathy, and positive perceptions of older adult experiences. The ASES went under peer and expert review prior to use, but has not yet been validated (Chen et al., 2015). In this study, the pre-survey yielded a $\alpha = .79$ ($M = 3.28$, $SD = .33$), while the post-survey yielded a $\alpha = .90$ ($M = 3.37$, $SD = .37$). The items were averaged to create a composite score for perceptions of older adult experiences and empathy both before and after the intervention.

Gray for a Day Experience

Nine questions rated on a 4-point scale from (1) *strongly disagree* to (4) *strongly agree* were included only in the post-test and asked questions related to the student's experiences of completing the daily tasks within the Gray for a Day program. Sample items included "I experienced frustration when I was unable to complete a task easily," and "I plan to improve my lifestyle in order to improve my sensory and functional well-being in the future." Each of the questions were used as single item indicators. Additionally, participants' feelings and emotions were gathered as part of the post-test via one question that requested them to select all the feelings they had during the simulation. Example feelings included "anger," "annoyance," "frustration," and "sadness." Each emotion was analyzed separately to get a general idea of what participants were feeling during the Gray for a Day program.

Analytic Approach

Paired samples t-tests were ran in SPSS (Version 26.0) to test the effect of participation in the Gray for a Day program on ageism, empathy, attitudes toward older adults and aging anxiety. To begin, data was cleaned and participants that did not complete all primary measures of the pre-and post-survey were removed. Then, the data was checked for outliers and normality by reviewing histograms and boxplots; all data appeared to be normal. Frequencies and descriptive statistics were ran to gain an overall sense of the data. All scales were checked for reliability.

Chapter 4 - Results

Paired samples t-tests were used to test the null hypothesis that there was no change in ageism, empathy, attitudes towards older adults, and aging anxiety after participation in the Gray for a Day program. The paired samples t-tests determined that attitudes towards older adults were significantly more positive after participating in the Gray for a Day program ($M = 60.76$, $SD = 19.61$) than before ($M = 64.76$, $SD = 22.13$), $t(122) = 2.95$, $p = .004$, $d = 0.27$, and perceptions of older adult experiences were also significantly more positive after the program ($M = 3.37$, $SD = 0.37$) than before ($M = 3.28$, $SD = 0.33$), $t(122) = 2.96$, $p = .004$, $d = .27$. The measures of ageism and aging anxiety also improved following participation in Gray for a Day, but not significantly. Ageism was slightly higher ($M = 3.10$, $SD = 2.78$) before participation than after ($M = 3.07$, $SD = 3.00$), $t(122) = .11$, $p = .909$, $d = .01$. Aging anxiety was the same, with slightly higher scores before participation ($M = 2.53$, $SD = .51$) than after ($M = 2.48$, $SD = .45$), $t(122) = 1.81$, $p = .073$, $d = .16$. Scores for empathy, however, showed small, non-significant decreases from before the program ($M = 4.17$, $SD = 0.46$) to after ($M = 4.13$, $SD = .51$), $t(122) = 1.47$, $p = .145$, $d = .13$.

The Gray for a Day experience section included in the post-test shows from self-report that the program was effective in increasing participant awareness of functional and sensory declines associated with aging ($M = 3.49$, $SD = .52$) and how those declines can impact daily life ($M = 3.48$, $SD = .55$). Participants also indicated being encouraged to think about how to better interact with ($M = 3.45$, $SD = .52$) and support older adults ($M = 3.40$, $SD = .52$), as well as an increase in understanding the steps they can take to improve their own future well-being ($M = 3.38$, $SD = .50$) and plans to improve their current lifestyle ($M = 3.37$, $SD = .59$). Feelings most highly reported during the simulation were: annoyance (58.5%, $n = 72$), frustration (52.8%, $n = $

65), and impatience (43.9%, $n = 54$). A summary of results of the Gray for a Day experience can be found in Table 3.

Table 3

Descriptive Statistics for Gray for a Day Experience (n = 123)

Gray for a Day Experience	Min.	Max.	Mean	SD
Frustrations with loss of ability	1	4	3.11	.63
Attitudes did not change	1	4	1.86	.74
Frustrations with inability to complete tasks	1	4	3.11	.63
Increased awareness of sensory and functional decline	2	4	3.49	.52
Increased understanding of impact on daily life	2	4	3.48	.55
Encouraged to think about how to interact with older adults	2	4	3.45	.52
Encouraged to think about how to support older adults	2	4	3.40	.52
Increased understanding of steps to future well-being	1	4	3.38	.50
Plans to improve lifestyle	3	4	3.37	.59
Feelings during Gray for A Day		%		*n*
Anger		5.7		7
Annoyance		58.5		72
Being Upset		6.5		8
Confusion		25.2		31
Embarrassed		32.5		40
Frustration		52.8		65
Helplessness		30.9		38
Impatience		43.9		54
Sadness		11.4		14
Tiredness		26.8		33

Chapter 5 - Discussion

The purpose of this study was to evaluate the Gray for a Day program's effects on ageism, empathy, attitudes toward older adults, and aging anxiety in a sample of Midwestern college students enrolled in an introductory human development course. Previous studies using aging simulation interventions have shown increases in empathy, (Chen et al., 2015, Henry et al., 2011; Lucchetti et al., 2017; Varkey et al., 2006), improved attitudes towards older adults (Brinker et al., 2014; Chen et al., 2015; Varkey et al., 2006), decreases in aging anxiety (Brinker et al., 2014), improved perceptions of older adult experiences (Chen et al., 2015), and worsened attitudes toward aging (Lucchetti et al., 2017).

The results of the paired samples t-tests for this study showed significant improvements in attitudes toward older adults and perceptions of older adult experiences. The finding of improved attitudes toward older adults are in line with the findings of other aging simulation interventions that also resulted in improvements in attitudes toward older adults (Brinker et al., 2014; Chen et al., 2015; Varkey et al., 2006). Improvements in perceptions of older adult experiences is also supported by the findings in Chen et al. (2015) study that evaluated the use of an aging simulation game with pharmacy students.

However there were no significant changes found in ageism, empathy, or aging anxiety. Henry et al. (2015), reported findings of enhanced empathy following the Aging Game, however these findings were done through thematic analysis of participant reflections and in the quantitative piece of the study, only one of four empathy items increased significantly, that item being "I understand what it feels like to have problems growing older." In the study done by Brinker et al. (2014), the initial study found no changes in aging anxiety. Following those findings, researchers extended the study to another group, and made changes including extending

the aging anxiety scale from a 5-point to a 7-point Likert type scale, so that smaller degrees of change could be detected, and increased guidance for discussions following the activity.

Implications for Research, Theory and Practice

More research is needed using Gray for a Day with additional audiences and incorporating changes addressed from other studies, including the addition of a qualitative piece as well as group discussion times. Additional research could also examine relationships between ageism, empathy, attitudes towards older adults, and aging anxiety. Future research on aging could also examine the constructs of ageism, empathy, attitudes toward older adults and aging anxiety to look for possible associations. The study supports the use of Kolb's experiential learning theory for improving attitudes and perceptions. Future research utilizing Kolb's experiential learning theory should incorporate a follow-up assessment to evaluate learning following all four processes of the theory. This would allow for a better understanding of the benefits and use of active experimentation as a process of learning to further support the theory.

Based from findings of Henry et al. (2015) and Brinker et al. (2014), a few changes to the program and evaluation process may be beneficial. For future evaluation of Gray for a Day, the inclusion of qualitative questions may reveal differing results, especially for empathy. As when asked to report feelings participants felt during the Gray for a Day experiences, 58.5% reported feelings of annoyance and 52.8% reported feelings of frustration. On the Gray for a Day Experience measure, students also reported an increased understanding in how age-related sensory and functional decline can impact one's daily life. As Gray for a Day is currently presented, end of program discussion questions are done with the entire class. Breaking up groups and allowing for more discussion time may lead to more significant changes and also

would provide for more time for students to reflect on their experiences and create new concepts and ideas of older adult experiences.

Strengths and Limitations

Although not all findings were significant, this study had a number of strengths. It examined a variety of factors around older adults and aging that can be impacted through aging simulations. The study also utilized measures with strong reliability scores. Utilizing Kolb's experiential learning theory provides a strong basis for understanding the ways in which simulated experiences can be used for learning concepts that impact ageism, empathy, attitudes toward older adults, and aging anxiety.

Limitations of this study include the sample, which was primarily White (91.1%) and female (86.2%); this is not representative of the university's demographics as a whole, with 75.7% being white and 50.4% female in the Fall of 2019 (Kansas State University, n.d.), though it is likely representative of those in human service-focused majors. Another limitation involves a missing piece for completing Kolb's experiential learning theory. Following the theory, the final piece of learning involves active experimentation, which would include allowing time for learners to practice their new knowledge in interactions with older adults and in everyday life. A potential limitation of this study was the lack of time for students to participate in active experimentation before completing the post-survey or the lack of a follow-up survey a few months after the intervention to assess more long-term changes and to allow for the final step of the learning process. An additional limitation of this study was the lack of control variables including age, race, sex as well as additional factors such as interest in future careers, which may be beneficial when reviewing use of aging simulation interventions.

Conclusion

The results from this study support the use of Gray for a Day, following Kolb's experiential learning theory, for improving attitudes toward older adults and perceptions of older adult experiences. With the rise in population proportion of older adults, as well as the notion that everyone is aging, understanding the aging process is crucial for everyone. The constructs in this study: ageism, empathy, attitudes toward older adults and aging anxiety all have a part in the way that older adults experience life and individuals experience aging (Boudjemad & Gana, 2009; Laditka et al., 2004; Levy & Myers, 2004; Levy et al., 2002). Because of this, it is vital that future research refines ways of educating individuals on the aging process to tackle such constructs.

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Appendix A - Survey

SECTION 1: Demographics (Pre-Survey only)

1. What are the last 4 digits of your cell phone number? This will help us to connect your responses later on.
2. What day of the month is your birthday? This will help us to connect your responses later on. If you were born on the 1st through 9th, please enter a 0 before the number (i.e., 05).
3. What year were you born? Please use four digits. For example, 1967, 1981, 2001.
4. What is your biological sex?
    a. Female
    b. Male
    c. Transexual
    d. Other Not Listed
    e. Decline to State
5. Which of the following best describes your racial or ethnic identity?
    a. American Indian, Native American, or Alaska Native
    b. Asian or Asian American
    c. Black or African American
    d. European
    e. Hispanic or Latino
    f. Native Hawaiian or Other Pacific Islander
    g. Middle Eastern or North African
    h. White or Caucasian
    i. Multiracial
    j. Other not listed _____
    k. Decline to State
6. Which of the following best describes your current class level?
    a. Freshman
    b. Sophomore
    c. Junior
    d. Senior
    e. Graduate Student
    f. Unsure
7. Have you taken (or are you currently taking) a course on older adulthood, such as a gerontology course?
    a. Yes
    b. No
    c. No, but I plan to in the future.
8. I have a close relationship with an older adult (such as a family member or friend).

  a. Strongly agree
  b. Somewhat agree
  c. Somewhat disagree
  d. Strongly disagree
9. I am interested in working with older adults as a part of my future career.
  a. Strongly agree
  b. Somewhat agree
  c. Neither agree nor disagree
  d. Somewhat disagree
  e. Strongly disagree

SECTION 2: Aging Simulation Experiences and Empathy Scale. Please select your response to the following statements.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
1. I plan to be patient with older adults in my daily life.	○	○	○	○
2. I plan to provide assistance to older adults in my daily life when I am able.	○	○	○	○
3. I have respect for older adults.	○	○	○	○
4. Disabilities make it challenging for older adults to	○	○	○	○

accomplish tasks.

5. I am aware of the challenges older adults face in their daily lives.

   ○   ○   ○   ○

6. I can empathize with older people.

   ○   ○   ○   ○

7. I am understanding of older adults.

   ○   ○   ○   ○

8. People treat older adults differently because of their age.

   ○   ○   ○   ○

9. I am aware of older adults' feelings.

   ○   ○   ○   ○

10. Young people take good health for granted.

    ○   ○   ○   ○

11. I can empathize with the older population as a whole.

    ○   ○   ○   ○

12. I have patience towards older adults.

    ○   ○   ○   ○

13. I can understand what it feels like to have

    ○   ○   ○   ○

problems growing older.				
14. Older adults spend a lot of time in the health care system.	○	○	○	○
15. Understanding older adults is valuable to me.	○	○	○	○

SECTION 3: Revised Fraboni Ageism Scale. Please select the response that best aligns with your attitudes and beliefs.

	True (1)	False (0)
1. Many old people are stingy and hoard their money and possessions.	○	○
2. Many old people are not interested in making new friends, preferring instead the circle of friends they have had for years.	○	○
3. Many old people just live in the past.	○	○
4. Most old people should not be trusted to take care of infants.	○	○
5. Many old people are happiest when they are with people their own age.	○	○
6. Most old people would be considered to have poor personal hygiene.	○	○
7. Most old people can be irritating because they tell the same stories over and over again.	○	○
8. Old people complain more than other people do.	○	○

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9. I would prefer not to go to an open house at a senior's club, if invited.

      ○   ○

10. Teenage suicide is more tragic than suicide among the old.

      ○   ○

11. I sometimes avoid eye contact with old people when I see them.

      ○   ○

12. I don't like it when old people try to make conversation with me.

      ○   ○

13. Complex and interesting conversation cannot be expected from most old people.

      ○   ○

14. Feeling depressed when around old people is probably a common feeling.

      ○   ○

15. Old people should find friends their own age.

      ○   ○

16. Old people should feel welcome at the social gatherings of young people.

      ○   ○

17. Old people don't really need to use our community sports facilities.

      ○   ○

18. It is best that old people live where they won't bother anyone.

      ○   ○

19. The company of most old people is quite enjoyable.

      ○   ○

20. It is sad to hear about the plight of the old in our society these days.

      ○   ○

21. Old people should be encouraged to speak out politically.

      ○   ○

22. Most old people are interesting, individualistic people.

      ○   ○

23. I personally would not want to spend much time with an old person.

      ○   ○

SECTION 4: Toronto Empathy Questionnaire. Below is a list of statements. Please read each statement carefully and rate how frequently you feel or act in the manner described. There are or right or wrong answers or trick questions. Please answer each question as honestly as you can.

	Never (1)	Rarely (2)	Some-times (3)	Often (4)	Always (5)
1. When someone else is feeling excited, I tend to get excited too.	○	○	○	○	○
2. Other people's misfortunes do not disturb me a great deal.	○	○	○	○	○
3. It upsets me to see someone being treated differently.	○	○	○	○	○
4. I remain unaffected when someone close to me is happy.	○	○	○	○	○
5. I enjoy making other people feel better.	○	○	○	○	○
6. I have tender, concerned feelings for people less fortunate than me.	○	○	○	○	○
7. When a friend starts to talk about his/her problems, I try to steer the conversation towards something else.	○	○	○	○	○
8. I can tell when others are sad even when they do not say anything.	○	○	○	○	○
9. I find that I am "in tune" with other people's moods.	○	○	○	○	○

10. I do not feel sympathy for people who cause their own serious illnesses.	○	○	○	○	○
11. I become irritated when someone cries.	○	○	○	○	○
12. I am really interested in how other people feel.	○	○	○	○	○
13. I get a strong urge to help when I see someone who is upset.	○	○	○	○	○
14. When I see someone being treated unfairly, I do not feel very much pity for them.	○	○	○	○	○
15. I find it silly for people to cry out of happiness.	○	○	○	○	○
16. When I see someone being taken advantage of, I feel kind of protective towards him/her.	○	○	○	○	○

SECTION 5: Refined Aging Semantic Differential. Below is a list of 24 polar opposite adjective pairs on a 7-point scale. The middle block is neutral. Please select the point that best represents your judgment about older adults. Make each item a separate and independent judgment. Don't be concerned about how your mark any of the previous items, and don't worry or puzzle over individual items. It is your first impression or immediate feeling that is most important. Please be sure to mark each item on the scale.

	1 (1)	2 (2)	3 (3)	4 (4)	5 (5)	6 (6)	7 (7)	
Cheerful	○	○	○	○	○	○	○	Crabby
Pleasant	○	○	○	○	○	○	○	Unpleasant
Friendly	○	○	○	○	○	○	○	Unfriendly

Kind	○	○	○	○	○	○	○	Cruel
Sweet	○	○	○	○	○	○	○	Sour
Nice	○	○	○	○	○	○	○	Mean
Tolerant	○	○	○	○	○	○	○	Intolerant
Cooperative	○	○	○	○	○	○	○	Uncooperative
Fair	○	○	○	○	○	○	○	Unfair
Grateful	○	○	○	○	○	○	○	Ungrateful
Unselfish	○	○	○	○	○	○	○	Selfish
Considerate	○	○	○	○	○	○	○	Inconsiderate
Patient	○	○	○	○	○	○	○	Impatient
Positive	○	○	○	○	○	○	○	Negative
Calm	○	○	○	○	○	○	○	Agitated
Thoughtful	○	○	○	○	○	○	○	Thoughtless
Humble	○	○	○	○	○	○	○	Arrogant
Frugal	○	○	○	○	○	○	○	Generous
Flexible	○	○	○	○	○	○	○	Inflexible

	Good	○	○	○	○	○	○	○	Bad
	Hopeful	○	○	○	○	○	○	○	Despairing
	Optimistic	○	○	○	○	○	○	○	Pessimistic
	Trustful	○	○	○	○	○	○	○	Suspicious
	Safe	○	○	○	○	○	○	○	Dangerous

SECTION 6: Aging Anxiety Scale. Below is a list of statements. Please read each statement carefully and rate how much you agree or disagree with the statement. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
1. I enjoy being around old people.	○	○	○	○	○
2. I like to go visit my older relatives.	○	○	○	○	○
3. I enjoy talking with old people.	○	○	○	○	○
4. I feel very comfortable when I	○	○	○	○	○

am around an old person.

5. I enjoy doing things for old people.
    ○   ○   ○   ○   ○

6. I fear it will be very hard to me to find contentment in old age.
    ○   ○   ○   ○   ○

7. I will have plenty to occupy my time when I am old.
    ○   ○   ○   ○   ○

8. I expect to feel good about life when I am old.
    ○   ○   ○   ○   ○

9. I believe that I will still be able to do most things for myself when I am old.
    ○   ○   ○   ○   ○

10. I expect to feel good about myself when I am old.
    ○   ○   ○   ○   ○

11. I have never lied about my age in order to appear younger.
    ○   ○   ○   ○   ○

12. It doesn't bother me at all to imagine myself as being old.
    ○   ○   ○   ○   ○

13. I have never dreaded the day I would look in the mirror and see gray hairs.
    ○   ○   ○   ○   ○

14. I have never dreaded looking old.
    ○   ○   ○   ○   ○

15. When I look in the mirror, it bothers me to see how my looks have changed with age.

   ○   ○   ○   ○   ○

16. I fear that when I am old all my friends will be gone.

   ○   ○   ○   ○   ○

17. The older I become, the more I worry about my health.

   ○   ○   ○   ○   ○

18. I get nervous when I think about someone else making decisions for me when I am old.

   ○   ○   ○   ○   ○

19. I worry that people will ignore me when I am old.

   ○   ○   ○   ○   ○

20. I am afraid that there will be no meaning in life when I am old.

   ○   ○   ○   ○   ○

SECTION 7: Gray for a Day Experience (Post-Survey only). Now we're going to ask you some questions about your experience participating in the Gray for a Day activity. Please answer each question to the best of your ability; there are no right or wrong answers. There will be no consequences for expressing your honest opinion.

1. Please select all of the feelings you had during the Gray for a Day simulation.
   a. Anger
   b. Annoyance

  c. Being upset
  d. Confusion
  e. Embarrassment
  f. Frustration
  g. Helplessness
  h. Impatience
  i. Sadness
  j. Tiredness
  k. Other _____

2. Please select your response to the following statements.

	Strongly Disagree (1)	Disagree (2)	Agree (3)	Strongly Agree (4)
1. I experienced frustrations when I lost an ability.	○	○	○	○
2. My attitude towards older adults did not change as a result of this experience.	○	○	○	○
3. I experienced frustration when I was unable to complete a task easily.	○	○	○	○
4. This program increased my awareness of sensory and functional decline.	○	○	○	○
5. This program increased my understanding of how age-related sensory and functional decline can impact one's daily life.	○	○	○	○
6. This program encouraged me to think about how I can better interact with older adults who may be experiencing sensory and functional decline.	○	○	○	○
7. This program encouraged me to think about how I can better support older	○	○	○	○

adults who may be experiencing sensory and functional decline.

8. My participation in this program helped me to understand that taking steps to be healthy now can contribute to my sensory and functional well-being in the future.

   ○　　　○　　　○　　　○

9. I plan to improve my lifestyle in order to improve my sensory and functional well-being in the future.

   ○　　　○　　　○　　　○