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"Mind Blown" – Including Exercise Science Students as Research Assistants to Reduce Ageist Perceptions

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Abstract

The amount of older adults is increasing rapidly and the demands of an aging population will need to be met by professionals in many fields, including exercise science. However, many undergraduate students do not want to work with older adults. Therefore, this qualitative study sought to examine the experiences and perceptions of exercise science students who served as research assistants in a six-month walking program for senior citizens. Students recognized that their previous ageist views about older adults' functioning (which originated from personal experiences, education, and society) were challenged by the walking program. Subsequently, more positive views on aging, being an older adult, and working with older adults were elicited by their assistance in the research study. Results from this investigation suggest that exercise science and allied health students be exposed to aging-sensitive experiences to dispel ageist perceptions and ultimately increase the workforce needed to serve this expanding population.

Keywords: aging, older adults, stereotypes, ageism, qualitative research

The United States population is aging rapidly and projections indicate that the percentage of U.S. adults over the age of 65 will increase from 13.0% in 2010 to 20.2% in 2050, which includes an increase from 1.9% to 4.3% for adults aged 85 and above (Colby & Ortman, 2014). Thus, greater numbers of older adults will be seeking ways to maintain their health and mobility into the later stages of their life. One well-studied method for maintaining and improving health and mobility is exercise, which has many cognitive and physical benefits for older adults (Tseng, Gau, & Lou, 2011; Vogel et al., 2009). As such, there will be a large need for practitioners willing to help older adults become and stay physically active, which means more opportunities in careers that promote activity such as physical therapy, occupational therapy, personal training, and group exercise instruction.

Given the above, students in exercise science, allied health, and other movement-related undergraduate programs need to be well-positioned to work with older adults in the future. However, per one survey of undergraduate exercise science programs, only 47% include content on exercise and aging (Elder, Pujol, & Barnes, 2003), while other research suggests that exercise science students have low levels of knowledge about aging (Vowels & Crandall, 2014). This is a significant gap considering that the Bureau of Labor Statistics (BLS, 2015) has predicted above-average job growth driven by increasing numbers of older adults in careers such as physical therapy, occupational therapy, and fitness training, all of which are careers that most exercise science students are interested in pursuing. Gilson and Deldin (2015) also point out that many retirement communities either have or will have wellness programs that include physical activity. Taken together, significant numbers of opportunities to work with older adults will exist in the next several years.

Though exercise science students have not been surveyed on this issue explicitly, many undergraduate students do not seem interested in working with older adults in the future. For example, only 5.4% out of over 1,000 surveyed social work students indicated interest in working in an aging-related career (Chonody & Wang, 2014). Other research has shown that social work students and future nurses endorsed negative viewpoints about older adults, and these negative viewpoints were linked with a lower likelihood of wanting to work with older adults (Anderson & Wiscott, 2003; D'A Slevin, 1991). There is also a general lack of awareness of reasons why students should receive education containing gerontological content (Gross & Eshbaugh, 2011). This is problematic for both older adults and students. Older adults may suffer due to a lack of

people to help them train and rehabilitate, while students may limit their employment opportunities and miss out on potentially fulfilling career paths.

Fortunately, many researchers and practitioners have reported on programs for undergraduate students designed to reduce negative views of older adults, which in turn may make students more open-minded about aging-related careers. An extensive review by Chonody (2015) into these interventions suggests that overall, they work. Over 80% of reviewed articles found that these interventions led to more knowledge and more favorable attitudes about older adults. Additionally, nearly two-thirds of the studies reported that participants became more interested in working with older adults in the future. Most of the reviewed interventions were a combination of information (e.g., workshops, courses focused on aging or the lifespan) and exposure (e.g., internship, service-learning projects, class projects) (Chonody, 2015). In agreement with these findings, a meta-analysis revealed that when detailed information about specific older adults were made available to young adults, they endorsed fewer ageist stereotypes about older adults in general (Kite, Stockdale, Whitley, & Johnson, 2012). A major implication from this analysis was that if young adults viewed their behaviors and the behaviors of older adults as being similar, perceptions of differences were diminished.

While the review articles (Chonody, 2015; Kite et al., 2012) covered many different types of interventions, absent were interventions where students worked on long-term research projects as research assistants. In this context, students could be exposed to many older adults on a regular basis, providing opportunities for interactions that students likely would not have otherwise. If assessments are conducted repeatedly, students could observe greater improvements or a wider range of outcomes than they may imagine is possible for older adults. Finally, as many exercise science programs do not include content on aging (Elder et al., 2003), long-term involvement on a project could be a useful supplement for many curricula.

Physical Activity Interventions and Exercise Science Students

Many stereotypes and ageist beliefs about older adults center on their physical characteristics (e.g., lack of mobility, unfit, weak). As Flora and Faulkner (2006) argued, exposure to older adults in an exercise or activity-based context could challenge those stereotypes, showing that many older adults are physically healthy and functionally fit. This is particularly important for

exercise science students who study physical activity but likely have limited experience with or exposure to older adults in activity settings.

Since 2005, at least eight studies have been published that specifically targeted students in exercise science, allied health, or other movement-related programs with the broad goals of reducing ageist beliefs and/or increasing positive attitudes towards older adults and aging. Because of their career interests, these students are ideal candidates for interventions that directly or indirectly seek to increase willingness to work with older adults. The earliest study explored the outcomes of a 6-hour workshop centered on learning about ageism, developing awareness of one's own prejudicial beliefs, and creating a plan for changing stereotypical beliefs (Moriello, Smey, Pescatello, & Murphy, 2005). Compared to a control group, the workshop group scored significantly higher on a quiz assessing knowledge of basic facts about physical, cognitive, emotional, and social well-being in older adulthood one week after the intervention. However, that enhanced knowledge disappeared 10 weeks after the workshop. The allied health students in this study also reported more positive attitudes towards older adults, though this was not a significant increase.

Two studies explored the results from having allied health students play 'The Aging Game' (Douglass, Henry, & Kostiwa, 2008; Henry, Douglass, Kostiwa, 2007). Students who played the game wore equipment that simulated disabilities older adults may experience. For example, some students received earmuffs to simulate hearing loss. Once the equipment was worn, students traveled to different stations where program facilitators demonstrated both stereotypical and positive communication patterns. From the facilitators' perspective, students became frustrated when they were treated in a stereotypical manner, but this caused them to reflect on what it would be like to live with those impairments every day (Douglass et al., 2008). From the students' perspective, compared to pre-tests, anxiety about aging increased slightly after playing the game, but most maintained positive attitudes towards older adults as assessed by a semantic differential scale (i.e., students selected more positive adjectives to describe older adults than negative adjectives) (Henry et al., 2007).

The next two studies were completed with exercise science students. In the first, students were given lifespan development training and additional education on constructing physical activity programs for older adults in a series of lectures and workshops (Hernandez & Gonzalez, 2008). Following the educational portion of the intervention, each student group designed a 50

minute session that combined physical exercise and games. The student groups then ran the session with older adults. Compared to the pre-test assessment, there was a small reduction in the number of intervention group students who endorsed negative old age stereotypes while the number of control group participants who endorsed negative stereotypes increased slightly. In a similarly designed study, students conducted physical fitness assessments at a retirement community, but were surprised at how well the older adults scored (Powers, Gray, & Garver, 2013). Afterwards, students used the results to design an exercise program focused on improving functional fitness and explained it to the older adults they had assessed. Following the program, student attitudes towards older adults were more positive compared to their pre-test results.

Another two studies followed exercise science students as they developed and administered a program called 'Bingocize' that combined the game Bingo with physical activity (Crandall, 2014; Willard & Crandall, 2016). Each Bingocize session took approximately 60 minutes, with 40 of those minutes dedicated to exercise, and the remaining 20 minutes dedicated to Bingo. In the first Bingocize study, based on weekly reflective logs, students reported viewing their experience as positive, but some seemed to be frustrated by only perceiving small improvements in the older adults' functional fitness (Crandall, 2014). In the second Bingocize study, however, post-test assessments showed that participating and non-participating students did not improve their level of knowledge of older adults and actually increased their ageist attitudes about older adults (Willard & Crandall, 2016). These results show that while activity-based intergenerational service-learning programs can challenge negative beliefs, they may also reinforce stereotypes.

Finally, therapeutic recreation students participated in weekly discussions and presentations about aging with older adult volunteers (Genoe, Crosbie, Johnson, Sutherland, & Goldberg, 2013). In follow-up interviews, students reported several attitude changes, including seeing older adulthood in a more positive light, becoming less fearful of aging, recognizing that a person can be both old and fit, and understanding the importance of learning about aging. Additionally, as with other research conducted with exercise science students (Powers et al., 2013), students were surprised at how active the older adult volunteers were (Genoe et al., 2013).

Purpose

Of the various interventions outlined in Chonody's (2015) review, almost all of them were information-based, exposure-based, or both. This same pattern emerges when looking at studies

that utilized physical activity as part of the intervention or targeted students in activity-related disciplines. Usually, improvements in attitudes towards older adults, aging, and working with older adults in the future were observed. To date, however, it appears that no study has explored whether being a research assistant on a long-term exercise science project could also elicit these positive changes. This type of intervention would provide consistent and direct interactive exposure to older adults in a physical activity setting, likely producing changes in attitudes. Therefore, the purpose of this study was to explore if and how the attitudes, thoughts, and beliefs about older adults of undergraduate exercise science students changed following their time as a research assistant on a project with older adult participants.

Additionally, most of the existing research in the literature is quantitative, or quantitative with one or two open-ended questions for analysis. Few research studies have primarily relied on qualitative methodologies. Therefore, this research project was conducted using qualitative methods to provide rich descriptions of how students' attitudes, thoughts, and beliefs may have changed.

Method

Sample

Prior to the start of the study, IRB approval and informed consent were obtained. The sample for this study consisted of four undergraduate exercise science students who were between 20 and 26 years old, and who attended a small, rural, public university located in the Mid-Atlantic region. Participants were three males and one female, and included three Caucasians and one Hispanic American. Out of the four students, only one had completed a course in gerontology, and this student was also a gerontology minor.

The students voluntarily helped implement a research project that examined the beneficial effects of a walking program for approximately 20 independently functioning older adults at a rural senior center. The walking program utilized a combination of pedometers, pre-planned walking routes, goal setting, and information to encourage the seniors to achieve a daily average of 10,000 steps. Measured outcomes included basic anthropometric information (height, weight, body mass index), a variety of functional fitness assessments (static balance, get up and go, six-minute walk, chair stands, gait speed), and psychosocial questionnaires (affect, walking and balance self-efficacy beliefs, social connectedness, perceptions of well-being). All of the older

adult participants were between the ages of 63 and 86 years, without any cognitive impairments (Montreal Cognitive Assessment score ≥ 26), in relatively good health, and who did not need to use a walking aid.

The walking program was 6 months in duration, with assessments taking place at the beginning of the program, every month during the program thereafter, and at a follow-up period three months after the program's end, for a total of eight assessments. All assessments took place at the senior center to which the older adults belonged. Prior to the start of the walking program, the four student research assistants were trained on how to conduct the assessments with older adults. During the program, student research assistants ran assessments alongside faculty, and often led tests on their own. In total, each set of anthropometric and functional fitness assessments took approximately 30 minutes to complete, with participants completing the questionnaires on their own afterwards.

Overall, all four student research assistants directly interacted with the older adult participants at all eight assessments. Assessments took place during a four day timeframe within a one-week span, depending on participants' schedules. With the exception of one month for one student, each student volunteered on at least two of the assessment days each month. In total, students were present for at least 16 assessments. On each day, between three and eight participants were assessed. In between running tests, students actively engaged the program participants in conversation. Because testing was conducted each month, each student interacted with the same group of older adults multiple times, which allowed relationships to develop. On top of this, one student recorded pedometer data weekly, which meant direct interaction with older adults each week for 6 months.

Data Analysis

Using Grounded Theory (Glaser & Strauss, 1967) to drive the qualitative research study, three intensive interviews with the four student research assistants were conducted using the constant comparison method. Qualitative research is inductive, meaning that researchers strive to ascertain new explanatory theory, not to test previously established theories (Glaser & Strauss, 1967). Grounded theory is an appropriate qualitative research method to use when developing conceptual models from qualitative data (Strauss & Corbin, 1998). Furthermore, grounded theory

is helpful when trying to understand the delicate nuances of research participants' points of view (Strauss & Corbin, 1998).

All interviews were audiotaped and then transcribed by the researchers. The audiotapes and transcriptions were kept in a password protected folder on the university's hard drive. Transcripts from all interviews were coded with NVivo 11 qualitative data analysis software (QSR International, 2015). Three interviews were conducted with each student, either in-person or via telephone. The initial interview lasted between 20 and 30 minutes, the second between 10 and 15 minutes, and the third between 5 and 10 minutes. In total, each student was interviewed for 30 to 45 minutes.

The first interview asked students about their prior exposure to older adults, what they felt about being part of the research project, and what they thought about the older adults before and after helping conduct the research project. From the initial themes gathered in the first set of interviews, a semi-structured interview guide was developed for the second interview. The second interview honed in on further describing the themes. After the first and second interviews, a model was developed that displays the processes by which participating in the senior walking program helped students dispel their ageist attitudes and thoughts (see Figure 1). The third interview was utilized for member checking (Lincoln & Guba, 1985). Theoretical saturation was reached after the second interview (Glaser & Strauss, 1967). Trustworthiness was established by member checking, persistent observation, and peer debriefing (Lincoln & Guba, 1985).

Results

Overall, the model outlines students' beliefs about older adults before and after their participation as research assistants. Prior to the study, students cited three "Factors that Influenced Ageist Ideas" that seemed to contribute to the development of several "Preconceived Ageist Ideas" centered on different aspects of older adults' functioning. Their time as research assistants provided them with regular "Real World Experience" with older adults. Following the program, students experienced "Positive Changes in Perceptions" about older adults' functioning, which in turn led to an overall "Positive Outlook on Older Adults and Aging."

Factors that Influenced Ageist Ideas

The students believed that they were exhibiting signs of ageism prior to the start of the study, which is interesting because all four students had positive experiences with older adults in their lives. Prior to the study, students believed that their "participants were going to die," that the older adults "couldn't do anything," and that they would "have less drive compared to younger people…less motivation to be active." Going into the second round of interviews, the students clarified which factors contributed to their ageist ideas. These three influencing ideas are ranked in order as: Personal Experiences, Education, and Societal Stereotypes.

Personal experiences.

Past personal experiences appeared to influence student perspectives the most in this research study. Student 1 believed that his/her personal experience with older adults did affect his/her thought process before going into the study, stating "you see people around you or see older adults already having issues, like bad joints, bad ability to remember things." Student 3 believed that his/her thought-process was attributed to "poor exposure to older adults." For example, Student 3 linked his/her lack of exposure to the distance s/he lived away from them, saying "in my instance my grandparents live 3 hours away. So the oldest people I really have contact with is my parents, and they're in their upper-40s, so they're nowhere close to the population we worked with." Students 2 and 4 also cited prior interactions with older relatives (such as grandparents or great-aunts and great-uncles) as large influences.

Education.

Another theme that emerged was how students' education impacted their preconceived ideas on older adults' cognitive, physical, and social functioning. Student 2 stated that s/he learned in exercise science courses about "research saying, okay, with aging comes the muscle degenerative process and sarcopenia. So, I mean that's a proven thing. So, I think we're going in and looking at it as 'well, they should all be frail individuals'. But, we found out they weren't." Other academic disciplines also reinforced the negative aspects of aging in areas beyond physical fitness. As an example of the ageist myth regarding bonding and older adults, Student 3 stated that s/he "learned in class…that older people have tighter bonds socially than say a younger person would." While this may not seem ageist at a glance, it is a generalization of the overall older adult population. Student 1 stated that s/he learned in his/her sociology and psychology courses that "as you age things decline–your ability to remember, ability to process certain things–just declines."

This is another example of an ageist myth because not all older adults experience cognitive declines. While Student 4 was aware that "life doesn't always work out the way it does in textbooks," s/he "learned that as we get old, you become less mobile, you become less able to perform activities and exercise."

Societal stereotypes.

Students discussed the impact of society on their negative views on aging. Student 2 believed that s/he developed his/her views on aging from the "tons and tons of ads and advertisements for hip replacements and all these other things [like] assistance for older individuals." Students 1 and 4 agreed that the media was a source of information that facilitated their ageist beliefs. Student 3 viewed his/her culture as a source of her/his ageist thoughts:

> Our younger culture has a negative connotation towards older adults and they have various stereotypes towards older adults. So being around a younger culture primarily…those stereotypes have formed a certain ideology of, "as you get older your body's not gonna be able to do certain things" or "you're always going to be in decline."…I just feel like my generation just doesn't have the exposure or the knowledge that you really need to understand older adults. They just think that they're there, they're a nuisance. That's kinda the connotation of my generation.

Preconceived Ageist Ideas

When students were asked about their thoughts on the cognitive functioning of the older adult participants before the study began, Student 2 believed that "they wouldn't be able to comprehend some things." Student 1 discussed that s/he knew that "they're happy or they're set in their ways…don't bother me…just leave me alone," but also realized that "some people fall in-between that spectrum." Student 3 stated "it [cognitive functioning] wouldn't be necessarily as high as a younger individual's. It wouldn't be low by a long shot or anything, just not maybe as sharp as somebody around my age."

Students were also asked to discuss their ideas about older adults' physical functioning prior to the study. All four students believed that it would be "pretty low" or "poor." As Student 1 stated, "They're old. I don't expect them to be doing a whole bunch of demanding physical

activities. I expected to see some not so good physical assessment values or numbers or performance." Student 2 said that s/he learned that "as you age you have decreased mobility, you have lost muscle mass, your ability to build muscle goes down, you have more increase in fat as opposed to tissue…As you get older, your ability to function decreases as well." Student 2 also believed that the older adults participating in the program were going to be "more or less along the lines of being sedentary." Student 4 similarly stated "that as you get older you're not able to move as well and you lose functioning."

Lastly, students were asked their opinions about the social functioning of older adults. Two out of the four students believed that the walking program would help to foster social connectedness. However, the other two students felt that the seniors would not be connected socially, stating "I felt they would be more distanced" or that they would not have a social life. Student 4 identified his/her ageist beliefs prior to the study as, "I guess the stereotype is that, that old people are kinda grumpy, but there's also stereotypes of like, old women having like a, a knitting club, or being in, like, the Legion, or that type of area. Maybe just something, like as far as always being out with friends at bingo or something stereotypical like that."

Participating in the Research Study – "Real World Experience"

Overall, students felt that participating in the research study helped them learn that what is taught in class is not always pertinent in the "real world." The students were excited to work with people instead of reading from textbooks. As Student 4 stated, "being able to implement what I've learned a little bit into [research] was kinda cool." Student 1 stated that the difference between learning content in class versus experiencing it first-hand was "awesome…you can read journals and articles in textbooks and try to get that stuff into your brain, but actually seeing it first-hand, it's definitely opened my eyes." Student 3 believed that "having it taught to me and seeing it in person are two different things." Student 2 further elaborated about the difference between learning content in class contrasted with real life experience:

> What I've learned between biology and exercise physiology and anatomy, as you get older your ability to do things does decline. You do have decreased performance, whether it be physically, cognitive, or whatever you're looking at. But what we saw, we learned in class,

with exercise you can either decrease the amount of it and it declines, or, you can change it and the walking study has shown that it can change or at least let it slow down.

Positive Changes in Perceptions

Participating in the Walking Program changed students' perceptions of older adults' cognitive, physical, and social functioning from generally negative and/or stereotypical to generally positive. Student 1 stated that "it [the walking program] has changed my views—being part of the study…just being more open-minded…just going in without narrow views." Student 1 also shared that the knowledge s/he gained from participating in the walking program "has definitely helped out" with his/her internship at a community fitness center. Student 3 said that the walking program "changed my perception 100%" because s/he had more exposure to older adults.

Cognitive functioning.

All but one student believed that participating in the walking program helped to dissuade their negative view of an older adult's cognitive functioning. Student 4 stated, "I think there was actually a wider range in cognitive function than I expected…there were some that were very young-minded, meaning they were still very sharp and funny." Student 2 described his/her change in perception for cognitive functioning as "mind blown…they [study participants] were great, they understood it."

Physical functioning.

All four students agreed that participating in the study helped them change their perception of the physical functioning of older adults. Student 1 stated, "It surprised me, I'm not going to lie," while Student 3 felt that "they got around a lot better than I would expect." Student 2 initially thought that the older adults "would be like those little shriveled up older individuals who couldn't do two sit ups or chair stands." But after being a research assistant and "looking at the study, they were way more able to do that, so I do believe that changed."

Social functioning.

Three out of the four students believed that this study helped to change their perceptions on the social functioning of older adults. Student 2 said, "I thought they would be more distanced—

not as connected…and with the walking program a lot of them started communicating even more." Student 1 continued:

> It's really encouraging to see that they take their time out of their day to go to this building…to hang out with friends and put together puzzle pieces or have a bake sale or just different activities. And then to just see their activity board of what's coming up and apparently they do square dancing or some kind of exercise class there…so they're really involved!

Importance of social connectedness.

One additional theme of interest is that the students became more aware about the importance of social connectedness for older adults. Student 3 believed that the social connections seniors made during the research study "made people more engaged in the study and stick with it because their friends were involved or they were trying to compete with their friends to do better." Student 4 remembered "one subject in particular who had just moved and her husband had just died and she didn't have many friends and she was kind of depressed…and with the walking program she made some friends and there were some improvements there."

Positive Outlook on Older Adults and Aging

Participating in the walking program study overwhelmingly changed the students' negative perceptions of older adults to positive perceptions. When discussing the change in perceptions from working with the older adults, Student 4 said "the gap that I saw between an older adult and a younger adult has become less defined—meaning they're not much different. They're just people. They're just people who got old." Student 2 elucidated:

> I initially kind of thought most of them would be a very sedentary population, they were probably very unhealthy, that's what I initially thought. And then with the initial group, some of them were pretty active and already did a lot of stuff and some of them were in their 50s, 60s, and 70s, and in seeing that some of them with exercise are able to improve, see weight decline, see the improvements in how far they can walk, how fast they can move. So working with that population, my mind-set has changed. Definitely.

Working with older adults.

Students who once were not interested in working with the elderly now were more open to the idea, as stated by Student 4: "I probably wouldn't mind it as much…I didn't think I would want to work with older adults." Student 3 felt that "based off my career expectations and exposure to them [older adults], I would love to work with older adults…I wouldn't have a problem with it…It's a population I could definitely see myself working with." Student 2 elaborated:

> Especially after my experience with the program, I wouldn't be close-minded—I'd be open-minded about it. If I had the opportunity, I'd probably look forward to doing something like that. I want to be a collegiate coach, I want to work with a young population. It never really crossed my mind to work with an older population, but now that we've done this and it would present itself, I feel like I'd have fun and enjoy it.

Personal thoughts on aging.

Participating in this study also changed their own personal thoughts on aging in a more positive direction. Student 2 affirmed that "working with this group and seeing that physical fitness can help them improve physically, cognitively; showing that, I feel like it did change my perception of getting older. So I guess I'm not as afraid to get old now." Students 1, 3, and 4 observed that they needed to take care of themselves in order to have a good late life. As Student 4 remarked, "it really pointed out to me that I need to stay active for my entire life in order to have the retirement I want."

Thoughts on the overall aging process.

Lastly, helping with this study gave students valuable insights about the aging process. The study reinforced the idea that people age in different ways, breaking away from the stereotype that all older adults age at the same rate. While Student 3 did not think "necessarily that everybody aged at the exact same progression rate," s/he observed that "there are certain gaps where somebody shows no effects of aging or signs of aging at all, while somebody else is at the complete opposite end." For Student 4, this study "really put it in perspective, like the 'move it or use it or

lose it' adage. The people who seemed to be more active were better off as adults physically and mentally."

Discussion

Given that traditional exercise science career options will continue to grow in the future, with much of the increased demand being due to an increasing number of older adults, it is important to identify strategies for reducing ageist beliefs and increasing interest in a career with older adults for exercise science students. Therefore, the purpose of this study was to explore the utility of conducting an exercise science research project as a vehicle for changing undergraduate students' perceptions of older adults. Their perceptions were assessed through three different interviews that were conducted shortly after the research project's end.

Initially, students indicated that they held some ageist beliefs. This was particularly true for physical functioning, where all four students expressed that they expected the fitness levels of the older adult participants to be poor. Students also expected that the older adults' cognitive abilities would be diminished, and that many would be isolated and disconnected from those around them, or would socialize in stereotypical settings. This set of responses is not surprising: prior research has demonstrated that undergraduate students in general have negative beliefs about older adults (Chonody, 2015) and that exercise science students specifically have little knowledge regarding aging (Vowels & Crandall, 2014).

The students also discussed the source of those ageist beliefs. The most influential source was personal experience, or more accurately, their lack of personal experiences with older adults. Because students had little prior exposure to older adults, their beliefs likely stemmed from limited experiences (e.g., grandparents) or from what they see in everyday life. Additionally, because of having few meaningful experiences with older adults, students likely had no positive images to buffer against negative portrayals of older adults, thus making the other sources of ageist beliefs (such as media portrayals) more potent (Gross & Eshbaugh, 2011). As the results of prior research (Chonody, 2015) and this study show, facilitating personal connections between undergraduate students and older adults can diminish ageist beliefs. Therefore, encouraging students to help conduct research projects, particularly projects that allow for repeated personal interactions, may be another tool through which ageist beliefs are tackled. By exposing students to a wider variety of older adults, students are more likely to realize that any stereotypical views of older adults are narrow and do not represent all older adults.

The next strongest influence was education, which was interesting as education usually produces positive changes in knowledge of and attitudes towards older adults (Chonody, 2015). However, not all prior research has shown this. For example, McCracken and Fitzwater (1995) found a negative relationship between the amount of time spent lecturing about older adults and positive attitudes, indicating that more education led to less favorable views. Other research has come to similar conclusions for students (Chamberland, Rawls, Powell, & Roberts, 1978) and nurses (D'A Slevin, 1991). These findings suggest that education may inadvertently reinforce ageist beliefs, particularly for exercise science students who learn about topics like sarcopenia and difficulties with motor skills due to aging. This indicates that curricula for exercise science (and other programs) may need to emphasize that what happens on average is not true for all older adults and that these natural age-related declines can be resisted. For example, while it is true that our muscles naturally degenerate as we age, sarcopenia can be slowed by physical exercise (Leenders et al., 2013). This sentiment was also expressed by O'Hanlon and Brookover (2002), who suggested that instructors should include examples of healthy and active older adults.

The final source of ageist beliefs that students reported were societal stereotypes, specifically media advertisements and generational attitudes. Mass media typically depicts older adults in a negative light, if they are depicted at all (Mason, Kuntz, & McGill, 2015; Vasil & Wass, 1993). Given the lack of personal experiences with older adults, it is not surprising that media portrayals filled the gap in knowledge and influenced their views. This finding suggests that students are not blank slates, but rather, slates that already have information etched into them. In order to increase interest in working with older adults, educators may need to challenge these stereotypical images directly because of how likely those images are to be a driving force behind undergraduate students' perceptions about aging and older adults.

However, many of these negative perceptions about older adults and aging were changed as a result of being a research assistant. This practical, hands-on experience provided students with opportunities to see that many older adults do not fit stereotypical depictions. Students commented on how learning something and encountering it first-hand are two different experiences and that this caused them to look at aging differently. This fits well with intergroup contact theory, which states that exposure to members of an outgroup can reduce prejudicial beliefs (Pettigrew & Tropp, 2006).

Students largely reported that their perceptions of older adults' physical, cognitive, and social functioning changed in a more positive direction. Students were surprised at how much more physically capable the older adults were compared to their expectations, which is in-line with prior research (Genoe et al., 2013; Powers et al., 2013). This surprise also extended to cognitive functioning, with students realizing that the older adults were much sharper and more aware than expected. With regards to social functioning, students emphasized the role that connectedness played and discussed the importance of creating and maintaining relationships as one ages. They also pointed out that the walking program itself facilitated the creation of new friendships between the participants, suggesting that physical activity can produce more than physical benefits.

More broadly, students' perceptions of older adults and aging also changed in a positive way. Students explicitly discussed how their mindset changed as a direct result of their exposure to older adults in this setting and seeing what they were capable of doing. In fact, a 'humanization' process seemed to take place – one student described older adults as "people who got old" – which should lead to more accurate judgments about aging and older adulthood compared to relying on ageist stereotypes. This reinforces prior findings showing that more information causes young adults to perceive fewer age-related differences (Kite et al., 2012).

Encouragingly, these students revealed a greater indication to work with older adults after their time as research assistants. Again, this is in-line with prior research suggesting that most interventions improve a willingness to work with older adults (Chonody, 2015). Given the imminent need for more students in movement-related disciplines to take an interest in working with older adults, this is an encouraging result that suggests bringing students into the research process provides more benefits than research experience.

Finally, students' perceptions about aging – both in general and their own – shifted in a more positive direction. Students reported less fear about growing older and commented on how they gained a better understanding of how to age healthfully. The idea that interventions can reduce concerns or anxieties about aging is supported by some research (e.g., Genoe et al., 2013), but not all (e.g., Henry et al., 2007). This study adds to the literature suggesting that interventions can reduce anxiety about aging. Additionally, their experience as research assistants broadened their perspective of how aging takes place, which allowed them to see a wide range of abilities. This is likely in contrast to what they have observed personally or in the media and in the classroom, all of which tend to focus on narrower views of what it means to grow old.

As with any research study, there are strengths and limitations. A notable strength of this study is that it captures rich, qualitative data on the importance of having exercise science students participate in research with older adults. In the reviewed literature, there was a dearth of examples about including students in research studies to help dispel common ageist myths. This study also helped to change the mindset of the students. At the beginning, most of the students were not interested in working with older adults, however, after the research project, students indicated that they were more open to this idea. Overall, this suggests that having students act as research assistants may encourage them to work with older adults in the future.

Another strength of the study was the use of Grounded Theory. Grounded Theory is useful for exploring rare or rarely studied issues, which this study helped to accomplish (Maxwell, 2005; Strauss & Corbin, 1998). Grounded theory is a qualitative research technique which reinforces the use of a specific set of steps, ultimately enhancing and strengthening the research process (Strauss & Corbin, 1998). Furthermore, several means to enhance the trustworthiness of this research study were used, such as prolonged engagement, persistent observation, and member checks, which leant itself to a more robust and rigorous qualitative research study (Lincoln & Guba, 1985).

One of the major limitations of this study was the small sample size; only four exercise science students were interviewed for this study. A larger sample size may have elicited different data. Another limitation is the use of a qualitative research design. The results of this study cannot be generalized to any other student populations; however, they may be transferrable to other exercise science students (Lincoln & Guba, 1985). The researchers conducted this study over the course of four months. Although prolonged engagement, persistent observation, and theoretical saturation was reached during all three interviews, the time frame precludes this study from providing greater detail about the students' experiences with ageism and how it may have affected their participation with the older adults. Lastly, this study was conducted after the walking program ended, similar to a posttest-only design. The study would have been stronger had the researchers interviewed the students about their thoughts and experiences with older adults prior to the beginning of their assistance with the walking program and again after the walking program ended.

The results from this research study suggests that more research needs to be conducted on students in exercise science, allied health, and other movement-related programs about their hesitancies about working with older adults. For example, it appears that exercise science students have not been surveyed to ask about their interest in working with older adults upon graduation.

Another follow-up study could investigate whether students are receiving ageist myths or messages in their coursework. A comprehensive evaluation of course content could elicit information that may suggest educators are inadvertently sending ageist messages in their lectures and readings. Lastly, it may be interesting to evaluate if a mandatory course in gerontology for exercise science and allied health majors helps dispel myths surrounding growing older, ultimately encouraging students to want to work with older adults.

Conclusion

In conclusion, the purpose of this study was to examine the experiences of four exercise science students after aiding with a six-month long walking program. The data suggests that the students had some ageist thoughts prior to the study, mainly deduced through their personal experiences, education, and from society's perpetuation of older adult stereotypes. The students indicated that working one-on-one with older adults was the key factor in eliminating some of their stereotypes, which then allowed them to think about a potential future working with the geriatric population. If students can experience working with older adults prior to graduation, exercise science and allied health students may ultimately decide to pursue a career serving older adults.

References

Anderson, D., & Wiscott, R. (2003). Comparing social work and non-social work students' attitudes about aging: Implications to promote work with elders. *Journal of Gerontological Social Work, 42*, 21-36.

Bureau of Labor Statistics (2015, December 17). *Occupational outlook handbook*. Retrieved from http://www.bls.gov/ooh/

Chamberland, G., Rawls, B., Powell, C., & Roberts, M. J. (1978). Improving students' attitudes toward aging. *Journal of Gerontological Nursing, 4*, 44-45.

Chonody, J. M. (2015). Addressing ageism in students: A systematic review of the pedagogical intervention literature. *Educational Gerontology, 41*, 859-887.

Chonody, J. M., & Wang, D. (2014). Predict social work students' interest in gerontology: Results from an international sample. *Journal of Gerontological Social Work, 57*, 773-789.

Colby, S. L., & Ortman, J. M. (2014). *Projections of the size and composition of the U.S. population: 2014 to 2060* (P25-1143). Washington, DC: U.S. Census Bureau.

Crandall, K. J. (2014). Bingocize™: Successful integration of intergenerational service-learning into an exercise science practicum project. *Journal of Community Engagement and Higher Education, 6,* 12-18.

D' A Slevin, O. (1991). Ageist attitudes among young adults: Implications for a caring profession. *Journal of Advanced Nursing, 16,* 1197-1205.

Douglass, C., Henry, B. W., & Kostiwa, I. M. (2008). An aging game simulation activity for allied health students. *Educational Gerontology, 34,* 124-135.

Elder, C. L., Pujol, T. J., & Barnes, J. T. (2003). An analysis of undergraduate exercise science programs: An exercise science curriculum survey. *Journal of Strength and Conditioning Research, 17,* 536-540.

Flora, P. K., & Faulkner, G. E. J. (2006). Physical activity: An innovative context for intergenerational programming. *Journal of Intergenerational Relationships, 4,* 63-74.

Genoe, M. R., Crosbie, C., Johnson, B., Sutherland, V., & Goldberg, M. J. (2013). Educating for an aging population: Intergenerational learning within the therapeutic recreation classroom. *Therapeutic Recreation Journal, 47,* 276-290.

Gilson, T. A., & Deldin, A. (2015). Integrating a clinical exercise gerontology experience into a kinesiology curriculum. *Kinesiology Review, 4,* 392-397.

Glaser, B., & Strauss, A. (1967). *The Discovery of Grounded Theory*. Chicago, IL: Aldine Publishing Company.

Gross, P. E., & Eshbaugh, E. M. (2011). Tuning them in versus turning them on: How do we interest students in working with older adults? *Gerontology & Geriatrics Education, 32,* 122-134.

Henry, B. W., Douglass, C., & Kostiwa, I. M. (2007). Effects of participation in an aging game simulation activity on the attitudes of allied health students toward older adults. *The Internet Journal of Allied Health Sciences and Practice, 5,* 1-9.

Hernandez, C. R., & Gonzalez, M. Z. (2008). Effects of intergenerational interaction on aging. *Educational Gerontology, 34,* 292-305.

Kite, M. E., Stockdale, G. D., Whitley, B. E., & Johnson, B. T. (2005). Attitudes toward younger and older adults: An updated meta-analytic review. *Journal of Social Issues, 61,* 241-266.

Leenders, M., Verdijk, L. B., van der Hoeven, L., van Kranenburg, J., Nilwik, R., & van Loon, L. J. C. (2013). Elderly men and women benefit equally from prolonged resistance-type exercise training. *Journals of Gerontology: Biological Sciences, 68*, 769-779.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic Inquiry*. Newbury Park, CA: Sage Publications.

Mason, S. E., Kuntz, C. V., & McGill, C. M. (2015). Oldsters and ngrams: Age stereotypes across time. *Psychological Reports: Sociocultural Issues in Psychology, 116*, 324-329.

Maxwell, J. A. (2005). *Qualitative research design: An integrative approach* (2nd ed.). Thousand Oaks, CA: Sage Publications.

McCracken, A., Fitzwater, E., Lockwood, M., & Bjork, T. (1995). Comparison of nursing students' attitudes toward the elderly in Norway and the United States. *Educational Gerontology, 21*, 167-180.

Moriello, G. R., Smey, J. W., Pescatello, L. S., & Murphy, M. A. (2005). Influence of an educational intervention on pre-allied health students' attitudes toward older adults. *Gerontology & Geriatrics Education, 25*, 1-11.

O'Hanlon, A. M., & Brookover, B. C. (2002). Assessing changes in attitudes about aging: Personal reflections and a standardized measure. *Educational Gerontology, 28*, 711-725.

Pettigrew, T. F., & Tropp, L. R. (2006). A meta-analytic test of intergroup contact theory. *Journal of Personality and Social Psychology, 90*, 751-783.

Powers, M., Gray, M., & Garver, K. (2013). Attitudes toward older adults: Results from a fitness-based intergenerational learning experience. *Journal of Intergenerational Relationships, 11*, 50-61.

QSR International. (2015). NVivo Qualitative Data Analysis (Version 11) [Software]. Available from http://www.qsrinternational.com/

Strauss, A. & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage Publications.

Tseng, C., Gau, B., & Lou, M. (2011). The effectiveness of exercise improving cognitive function in older people: A systematic review. *Journal of Nursing Research, 19*, 119-130.

Vasil, L., & Wass, H. (1993). Portrayal of the elderly in the media: A literature review and implications for educational gerontologists. *Educational Gerontology, 19*, 71-85.

Vogel, T., Brechat, P.-H., Leprêtre, P.-M., Kaltenbach, G., Berthel, M., & Lonsdorfer, J. (2009). Health benefits of physical activity in older patients: A review. *International Journal of Clinical Practice, 63,* 303-320.

Vowels, M. R., & Crandall, K. J. (2014). A descriptive study of exercise science students' knowledge of, and attitudes toward, older adults. *Kentucky Association of Health, Physical Education, Recreation and Dance Journal, 51,* 66-73.

Willard, M., & Crandall, J. (2016). Intergenerational service-learning to combat ageism in exercise science students. *Kentucky Association of Health, Physical Education, Recreation and Dance Journal, 53,* 55-67.

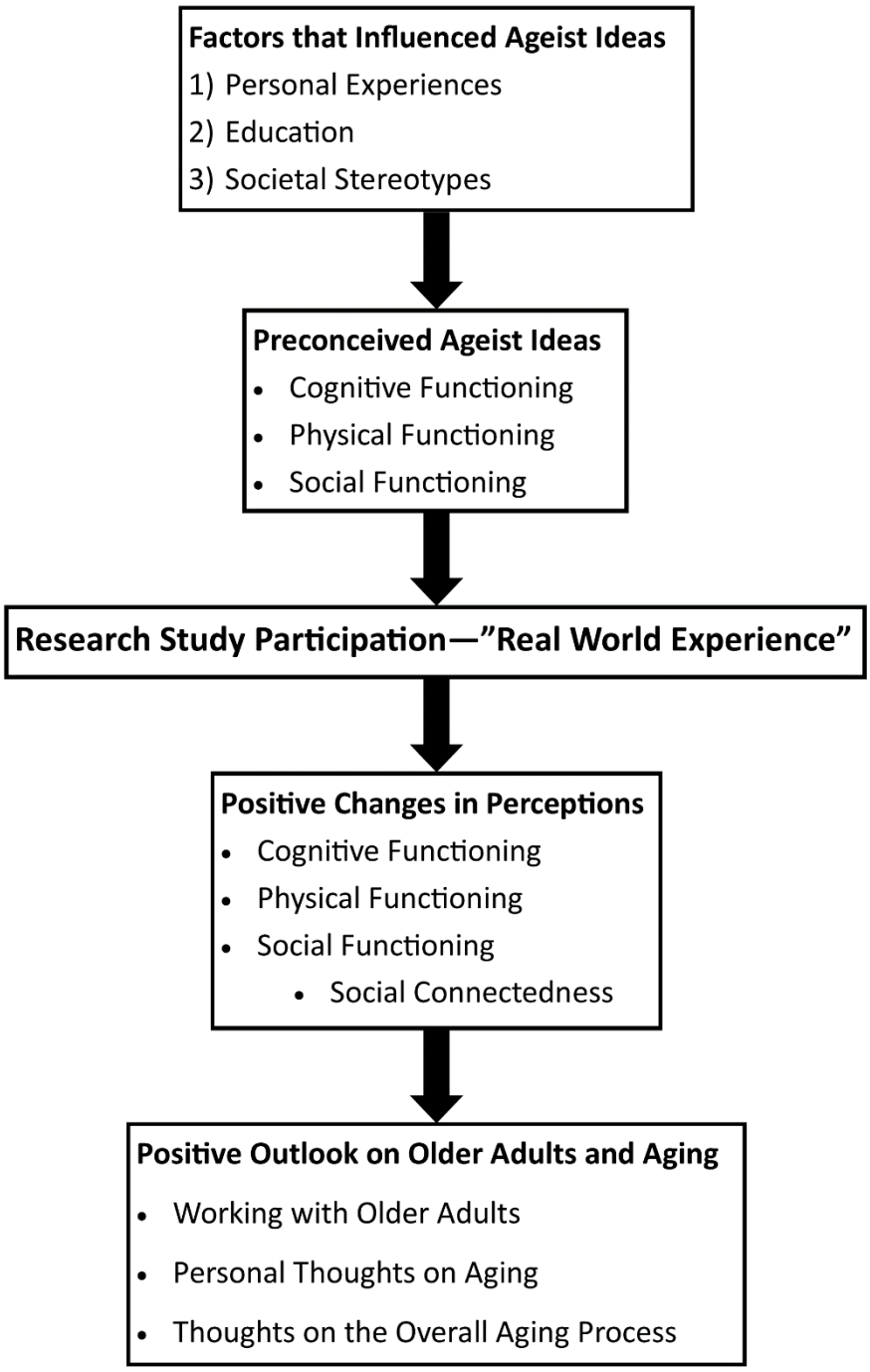

Figure 1. Model outlining students' thoughts and beliefs about aging and older adults before and after serving as research assistants.