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# Reducing Ageism: Changes in Students' Attitudes after Participation in an Intergenerational Reverse Mentoring Program

**Skye N. Leedahl** [1,*], **Melanie Sereny Brasher** [2], **Dara L. LoBuono** [3,4], **Bethany M. Wood** [5] **and Erica L. Estus** [6]

1   Department of Human Development & Family Science, University of Rhode Island, Kingston, RI 02881, USA
2   Department of Sociology & Anthropology, University of Rhode Island, Kingston, RI 02881, USA; mbrasher@uri.edu
3   Department of Nutrition & Food Sciences, University of Rhode Island, Kingston, RI 02881, USA; dara_lobuono@uri.edu or lobuono@rowan.edu
4   Department of Health & Exercise Science, Rowan University, Glassboro, NJ 08028, USA
5   The Steve Hicks School of Social Work, The University of Texas at Austin, Austin, TX 78751, USA; bethanymwood@utexas.edu
6   College of Pharmacy, University of Rhode Island, Kingston, RI 02881, USA; estus@uri.edu
*   Correspondence: skyeleedahl@uri.edu; Tel.: +1-401-874-4567

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**Abstract:** Ageism is a societal concern that greatly affects the social, emotional, physical, and mental health of older adults. One way to decrease ageist attitudes and improve the treatment of older adults is to address and improve age stereotypes among young adults. Using data from students participating in an intergenerational digital-learning program, the present study investigated change in students' stereotypes of older adults and aging. We examined change from pre- and post-scores in student attitudes toward older adults and the type of adjectives used to describe older adults. We also analyzed responses to open-ended questions about changes in perception of older adults and aging and interest in working with older adults. Findings showed that: (1) Students' attitudes improved following participation in the program; (2) students used fewer negative words to describe older adults following participation; (3) answers to open-ended questions demonstrated that many students improved their perceptions of older adults; and (4) many students showed increased interest in working with older adults in their future careers. Programs that reduce age stereotypes should be promoted in order to reduce young people's harmful ageist stereotypes, ensure respectful treatment of older adults in all workplace and social situations, and increase interest in aging-related fields.

**Keywords:** ageism; digital ecosystem learning; teacher training; innovations actions in education; intergenerational program; aging stereotypes; gerontology; older adults

## 1. Introduction

Age prejudice is a widely accepted, and institutionalized form of prejudice in the United States [1]—so common that many people tend to not fully recognize age prejudice when they experience it, and some may perpetuate it themselves [2]. In 1969, Butler defined ageism as "a prejudice by one age group toward other age groups" (p. 243) that often occurs as "a process of systematic stereotyping and discrimination against people because they are old" [3] (p. 35). Age prejudice harms societal ecosystems as it isolates older adults and creates generational divides between older and younger people on individual, community, and population levels [4,5].

Ageism is a particular societal concern at this time due to the population aging. As the number of older adults in the United States (US) rapidly increases [6], so do concerns about the way younger generations stereotype older generations [7]. Stereotypes often begin when we are young and are perpetuated by societal norms [2]. The term, *aging stereotypes*, is defined as a way to characterize older people, although the source of these characterizations is disputed among scholars with cultural, personal, self-stereotyping, and self-perceptions of aging being taken into account [7].

By 2050, those above the age of 65 will make up 22.1% of the US population [6] and the stereotypes that we as a society hold will greatly affect the social, emotional, physical, and mental health of this large population. Levy and Myers [8] found that addressing age stereotypes at young ages can predict better health later. Therefore, it is critical to develop interventions that address and decrease the stereotypes that younger generations may hold as the number of individuals potentially affected by these stereotypes increases. The present study investigated how an intervention that generates positive interactions between generations impacts age-related attitudes and stereotypes held by young adult participants. We argue that future efforts should similarly address these issues of ageism.

## 1.1. Ageism in Society

Ageism is such a common phenomenon and of such detriment to society that the World Health Organization has facilitated a campaign to eradicate global ageism [9]. As a result of ageism in society, older adults face pervasive negative stereotypes, such as the common view that physical and mental competence decline with age [10,11]. Ageism is found at all levels of societal ecosystems; for example, Nerenberg [12] (p. 103) uses the ecological model to show that ageism can disrupt the ecosystem when applied examining elder abuse. However, this kind of disruption can happen in a variety of ways at the individual level (e.g., threats to privacy or autonomy), community level (e.g., lack of volunteer opportunities for older adults), and societal level (e.g., a lack of accessible and affordable housing for older adults). In everyday life, we can witness acts of ageism, such as reduced contact with older people, age denial, and ageist humor [13]. At an institutional level, older adults experience housing and employment discrimination, mandatory retirement, and poor care in health and long-term care settings [14]. Levy et al. [15] calculated that healthcare costs due to ageism for one year were approximately 63 billion dollars. One implicit age-stereotyping study found that participants held more negative attitudes towards older people than towards other marginalized groups, such as LGBTQ+ individuals and African-Americans [16], though recent studies show discrimination against LGBTQ+ older adults [17,18].

Positive stereotypes, in addition to negative, also exist for older adults. The Stereotype Content Model (SCM) explains how groups are "sorted" in society and their status relates to the types of prejudice group members might experience. On the two dimensions of warmth and competence, older people are judged as high on warmth and low on competence [10]. Positive stereotypes, such as being wise or experienced, may be assigned to older adults, though negative stereotypes, such as being frail or nonproductive, are still common [19,20]. While positive stereotypes are often viewed as favorable, they can still limit the way individuals are viewed [21].

Among young people, in particular, research evidence indicates that negative stereotypes towards older adults are commonly held. For example, college students were found to frequently use ageist or biased language when discussing older people on Twitter for a class assignment [22]. These negative attitudes towards older adults presented on social media have been perpetuated in recent years with campaigns such as #OKBoomer, a meme adopted by younger adults to negatively describe the baby boomer generation [23]. In a survey of college students, the majority viewed older people as having poor vision, poor hearing, and being dependent. Students also tended to perceive older adults as more physically frail and narrow-minded [24]. Furthermore, negative views towards older people play out in both more collectivist and individual-oriented cultures. Data from Belgium, Costa Rica, China, Japan, Israel, and South Korea found that college students viewed older adults as incompetent and having low status [25]. Younger people may be more susceptible to negative stereotypes against older

people because the older life stage seems very far away, and they have fewer psychological resources to defend against this type of negativity [26]. These views may be shaped by previous or limited experiences with older adults in their communities, families, and when interacting in the workplace, and this can lead to initial communication challenges.

Several theories have attempted to explain the development of stereotypes and biases for both sexism and racism [27–30], but less attention has been given to the development of prejudices against older adult populations [1]. Social Identity Theory puts forth that individuals identify with their own age group, and are biased towards other age groups. The promotion of one's own age-group may enhance self-esteem [31]. A functionalist theoretical framework explains that when younger adults maintain stereotypes about older adults, it creates space between an individual's fears of becoming older and losing functionality [1]. Terror Management Theory states that individuals who are confronted with the finality of death through interactions with older adults often avoid the reality that everyone must age and instead identify strongly with those who are their own, younger age [32]. In addition, stereotypes allow for quick processing of information [8]. Age Stereotype Embodiment Theory (SET) puts forth the idea that age stereotypes come from the surrounding culture and are internalized at a young age, leading to negative consequences [2,22]. Several theories focus on the automatic association with the appearance of older adults and the subsequent assumption that older adults are less happy, productive, or interesting in comparison to younger generations [33].

### 1.2. Impacts of Ageism on Older Adults

Negative stereotypes of older people lead to discrimination and poor treatment in employment, health care, and other settings, as well as social exclusion and social isolation [10]. Social exclusion can lead to self-defeating behaviors [34], and social isolation is harmful to cognitive [35] and physical health [36]. Hehman and Bugenta [37] investigated older adults' and younger adults' cognitive and physiological responses to patronizing communication, such as elder speak or baby talk. Older adults randomized to the patronizing speech group were more reactive to patronizing speech compared to younger adults, exhibiting poorer performance on cognitive testing and an increase in cortisol levels [37]. However, there seemed to be a protective effect on cognitive performance among those older adults who had positive attitudes toward aging [37].

While individuals and society at large can hold negative attitudes towards older people, another issue is that older adults themselves often have internalized old-age stereotypes. People learn about stereotypes when young, and overtime these stereotypes become internalized [7,26]. In addition, these internalized stereotypes are reinforced by North American culture. A large body of research has examined individuals' self-perceptions of aging, including negative stereotypes and how these internalized stereotypes can affect their functioning and health (e.g., [8,15]). Moreover, when other people pity older adults and then this message is internalized, older adults are more likely to feel helpless [38]. Many of these negative attitudes and perceptions around aging can serve as a barrier for older adults to learn how to use technology and digital mediums. This is especially true when older adults seek advice from younger generations on how to use these technological mediums and are left feeling dismissed, causing older adults to feel labeled as "old fashioned" or "obsolete" [39]. A lack of technology adoption can result in further health disparities among older adults as healthcare information and management is rapidly becoming digitalized through the adoption of electronic health records and patient portals [40]. Therefore, addressing ageist attitudes when young people are young could help decrease ageism in the society for future older adults.

### 1.3. Ageism and Health Professionals

More positive attitudes towards aging could also increase interest in working with older adults among healthcare field students; this change might lead to higher quality care for our aging population [41]. Negative stereotypes can cause people to assume that older adults have poor health or well-being and are unable to learn new things, such as technology [19,42]. Stereotypes

permeate into healthcare settings and influence healthcare professionals' decisions to work with older adults [19]. For instance, many physicians and medical students associate older adults with disease, a decline in functionality, and death [43]. Stereotypes towards older adults among this group of healthcare providers include being depressed, needy, isolated, boring, irritable, easily confused, and nonproductive [44]. Physicians also found older adults to be depressing and frustrating [19], and often report they would rather work with younger patients as they are more willing and likely to follow the physicians' recommendations [45]. A study assessing dietetics students found lower knowledge and neutral attitudes toward aging; more than half of the students surveyed believed older adults were set in their ways, happy to retire, do not adjust to new conditions, and depend on others as they grow older [46]. Research indicates nurses may have more positive attitudes towards working with older adults in general, however, a research study surveying nursing students indicated little desire in working with dementia patients [47]. Additionally, with the rise of information and communication technologies utilized in healthcare, future health profession students need to feel comfortable using and introducing these new technologies to older adults to ensure that optimal patient-centered care is provided [48]. For example, pharmacy students working with older adults in technology programs can strengthen their communication skills, which can further assist them in their training.

Negative to neutral feelings towards aging and older adults among healthcare professionals and students support the need for education aimed at improving attitudes towards older adults [49]. Importantly, students who have had positive relationships with older adults that are not relatives are more likely to want to work with older adults in the future [50]. It is important to create these opportunities outside of the classroom in order to enhance these experiences.

### 1.4. Programs and Interventions for Reducing Ageism

Given the pervasiveness of age discrimination, internalization of age stereotypes, and ageism among health professionals, it is important to examine interventions that can reduce negative stereotypes. A growing body of research examines how interventions and intergenerational programs can influence university students' attitudes towards older adults. Most of these programs seek to educate students on aging rather than promoting a real-life interaction between college students and older adults. Wurtele and Maruyama [51] studied attitude changes towards older adults among college students in a lifespan human development course. After students participated in an "Activities of Older Adults" exercise, where student perceptions were contrasted with the actuality of older adult activity, negative stereotypes about older adults decreased. The findings suggest that stereotypes of aging may be lessened upon successful completion of the exercise and participation in the misconceptions discussion [51]. Hantman et al. [52] conducted a study on the effectiveness of an intergenerational classroom during a yearlong social work course. The objective was to help students gain understanding and awareness of the aging process, interpersonal skills, age sensitivity, and enhance feelings of mutuality and equality, and they found that students developed in these areas, broke down barriers, and had a positive perspective change towards older adults [52]. Another program, "Time After Time," included both creative and artistic based activities in which older adults interacted with younger people daily for several weeks. Study findings showed that the program promoted greater understanding and respect between generations [53]. Older adult participants in the study reported that their stereotypes of younger people were challenged and became more positive [53].

Another research study documented the Elder Service Partner (ESP) Program, where sociology students were matched with older adults in the community, and the partners met regularly throughout the semester to complete a variety of community service activities together. Participation in the ESP program helped students overcome misconceptions and assumptions about older adults, create valuable relationships, and acquire better awareness of aging [54]. Similar findings were also found for the Working Together: Intergenerational Student/Senior Exchange (WISE) Program, a program with a relatively short time commitment that required university students in an aging course to meet with

older adults at an assisted living community three separate times to discuss different topics, in which perceptions and stereotypes were improved among both students and older adult participants [55].

We can argue that many of the aforementioned programs and studies somewhat correspond to the Levy PEACE model [56]. According to this model, there are two key contributing factors that have been shown to reduce negative ageism: (1) Education about aging, including facts about aging along with positive older role models; (2) positive contact experiences that are individualized, provide or promote equal status, are cooperative, involve sharing personal information, and are sanctioned within the setting. While most of the previous programs address factor one (education about aging), not all of these programs address all aspects of factor two (positive contact experiences); however, the current study examines a program that meets all aspects of both factor one and factor two. Further, this program works to meet a current, important community need, that of ensuring digital inclusion for older adults.

The present study was designed to examine how participation in an intergenerational service-learning program influences student participants' stereotypes of older adults and aging. We wanted to examine if a program that provides technology assistance to older adults using a reverse mentoring model would have similar impacts to other types of intergenerational programs. We also wanted to extend the literature to see if this type of program could contribute to students' interest in working with older adults in their careers. The research hypotheses for this study included:

1. Students' attitudes towards older adults and aging will improve following participation in an intergenerational service-learning program.
2. Participation in the program will enhance students' interest in working with older adults.

This article provides a unique contribution to the literature due to the program's emphasis on engaging health and human service professional students from across the university rather than from one university class as most of the research has done previously [51,54,55]. Further, this article presents information from a program that incorporates older adults in a way that emphasizes their ability to continuously learn and grow (i.e., positive interactions), which helps challenge negative stereotypes. This emphasizes how older adults are productive members of society, showing students a positive image rather than the negative views portrayed in the media or through popular culture. Finally, the combination of quantitative and qualitative data to extensively examine this intergenerational program provides an important contribution to the literature. In addition to the frequently used standardized scales, our study contributes to the literature by using sentiment analysis to examine students' changes in attitudes towards older adults.

## 2. Materials and Methods

This study included a convergent mixed-methods approach, where quantitative and qualitative data were collected simultaneously [57]. Data specific to attitudes and stereotypes of aging and older adults were collected. This paper analyzed data from university students participating in the University of Rhode Island Engaging Generations Cyber-Seniors program during the Spring 2016 academic semester. Students completed a pre-survey prior to holding any sessions with older adults and completed a post-survey within a week after program participation was completed for the semester. Details regarding program design and implementation have been previously published [58]. University of Rhode Island Engaging Generations Cyber-Seniors program is a reverse-mentoring, interdisciplinary, service-learning opportunity, where older adults and university students work together, mostly at senior or community centers, to help older adults learn how to use technology, and students gain valuable leadership, teaching skills, and problem-solving. Important to this program is the emphasis on promoting individualized, person-centered instruction, in which students are encouraged to get to know the older participants and brainstorm solutions and ideas together. The 24 students participating in the program and this study (meaning they provided both pre- and post-survey data) were from the University of Rhode Island's Colleges of Pharmacy, Arts and Sciences, and Health Sciences;

participation in this experience was assigned to students to meet class or program requirements. Specifically, the students' areas/majors of study were as follows: Human Development and Family Studies (*n* = 13), Pharmacy (*n* = 5), Psychology, (*n* = 3), Health Studies (*n* = 2), and Communicative Disorders (*n* = 1). Four additional students participated in the program but did not provide full pre- and post-data, so were not included in the study. This study was approved by the University's Institutional Review Board.

### 2.1. Quantitative Measures

### 2.1.1. Students' Attitudes towards Aging

To assess students' attitudes towards older adults, we used the Psychological Growth sub-scale, an instrument modified for younger adults from the Attitudes towards Aging Scale [59]. This questionnaire includes seven, 5-point Likert scale questions (e.g., How much do you agree with this statement? *It is a privilege to grow old*), and higher total scores indicate more positive attitudes towards aging.

### 2.1.2. Adjectives

On the pre- and post-surveys, students were asked to fill in the blank for the following phrase: "Older adults are: _____" with five adjectives. To examine the adjectives, we began by looking through the raw data of words/phrases provided by students, and we generated a list of unique words and phrases. Words/phrases that were similar, or misspelled, were combined. For example, "eager to learn" was combined with "eager to learn new things." Then, we used an online lexicon dictionary, the SO-CAL semantic orientation calculator that focuses on sentiment analysis, to score the adjectives [60]. This dictionary provides scores ranging from −5 to +5 for many of the adjectives found in our data. This is often referred to as a "bag of words" technique [58]. We double-checked to make sure that they made sense in our context, and only a few changes were needed. We then converted these scores to a 5-point scale.

For words/phrases not in the dictionary, we used three independent coders to evaluate whether words/phrases were positive, negative, or neutral. The coders were two gerontology faculty members and one advanced undergraduate gerontology minor. The three coders had 76% agreement overall, and a Krippendorf's [61] alpha of 0.848. Following Young and Soroka's approach [62], the scores from the three coders were arranged on a 5-point scale. When all three agreed that the word/phrase was negative, the score was coded as 1. When two of three coders said negative, it was coded as a 2. When two or more coders said neutral it was coded as a 3. When two of three coders said positive, it was coded as a 4. When all three coders said positive it was coded as a 5. Some examples of the various adjectives include: Positive (wonderful, witty, willing to help, resilient, sweet, open-minded, joyful, great, fulfilled, engaging); neutral (emotional, careful, cautious, different, traditional, storytellers); negative (sad, lonely, stuck in the past, frail, confused more easily). Once all adjective responses were scored, we were able to compute the following variables in the pre- and post-surveys: Number of adjectives provided, mean adjective score, count of positive adjectives, count of negative adjectives, count of neutral adjectives, and change in adjective score (from pre to post).

### 2.2. Quantitative Analysis

Quantitative data were analyzed using SPSS (v. 25). Data were analyzed for normality, and paired sample *t*-tests or Wilcoxon Signed Rank tests were used to assess pre- and post-differences in students' attitudes towards aging, total adjective scores, and counts of positive, neutral, and negative adjectives depending on whether the data were normally distributed. To examine the effect size, Z-tests were used. Categorical variables were reported as percentages and the McNemar test was used to calculate if the percentage of students interested in working with older adults pre- and post-intervention changed significantly.

### 2.3. Qualitative Measures and Analysis

Qualitative data were collected from questions gathered from students' pre- and post-surveys. First, on the post-survey, students were asked, "Has your perception of older adults and aging changed after volunteering? If so, how?" Second, on the pre- and post-survey, students responded to the question, "Do you plan to work with older adults in your career? If so, in what capacity? To analyze answers to these questions, we identified categories for responses and calculated a pre- and post-percent for each category. Then, we identified themes within each category using a deductive process in which statements were analyzed to fit within specific categories and themes. We had one advanced graduate student and one faculty member code the data and verify accuracy. With any disagreements, we met to discuss and come to an agreement.

## 3. Results

### 3.1. Change in Students' Attitudes towards Older Adults

From the Attitudes Towards Aging measure, there was a significant difference with a medium to large effect size between pre- and post-total scores among students ($z = -2.95$, $p < 0.01$). Therefore, findings indicate that overall students have a more positive attitude towards older adults and aging following program participation. In examining specific questions from the scale, all scores changed positively, and three questions showed significant pre- and post-change: *There are many pleasant things about growing older*, *people become more accepting of themselves as they grow older, and it is important that older people give a good example for younger people*. See Table 1 for detailed findings.

**Table 1.** Pre-/post-change in student attitudes and adjective outcomes.

| Attitudes and Adjectives | Pre-Mean (SD) | Post-Mean (SD) | z-Test | p | Effect Size * |
|---|---|---|---|---|---|
| *Total Attitudes Score (n = 24)* | 27.45 (3.42) | 29.42 (3.19) | −2.95 | 0.001 | 0.42 |
| As people get older, they are better able to cope with life | 3.5 (0.72) | 3.79 (0.83) | −1.43 | 0.152 | 0.21 |
| It is a privilege to grow old | 4.13 (0.61) | 4.21 (1.02) | −0.43 | 0.67 | 0.06 |
| Wisdom comes with age | 4.17 (0.70) | 4.38 (0.58) | −1.51 | 0.13 | 0.23 |
| There are many pleasant things about growing older | 3.79 (0.72) | 4.17(0.56) | −2.32 | 0.02 | 0.34 |
| People become more accepting of themselves as they grow older | 3.5 (0.72) | 3.96 (0.72) | −2.22 | 0.03 | 0.32 |
| It is very important for older people to pass on the benefits of their experiences | 4.33 (0.82) | 4.46 (0.83) | −0.09 | 0.53 | 0.63 |
| It is important that older people give a good example for younger people | 4 (0.78) | 4.46 (0.66) | −3.32 | 0.001 | 0.48 |
| *Mean Adjective Scores Across All Adjectives Provided (n = 24)* | 4.11 (0.93) | 4.42 (0.48) | −1.34 | 0.18 | 0.19 |
| Count of Positive Adjectives (n = 28) | 3.29 (1.65) | 3.32 (1.91) | −0.15 | 0.88 | 0.02 |
| Count of Neutral Adjectives (n = 28) | 0.25 (0.58) | 0.18 (0.39) | −0.59 | 0.56 | 0.078 |
| Count of Negative Adjectives (n = 28) | 0.61 (1.13) | 0.14 (0.36) | −1.98 | 0.048 | 0.26 |

\* Cohen's criteria for effect size. 1 = small, 3 = medium effect, 5 = large effect; the effect size is calculated by dividing the z-value by the square root of N (number of observations).

### 3.2. Change in Adjectives Used to Describe Older Adults

There were 184 adjectives scored. The total mean score for the adjectives showed that overall students had more positive words used on the post-survey ($M = 4.42$) compared to the pre-survey ($M = 4.11$); however, this was not significant. In examining the count of positive, neutral, and negative adjectives, the change in negative adjectives from pre to post was statistically significant ($z = -1.98$, $p < 0.05$). Therefore, this finding showed that students named fewer negative adjectives about older adults at the post-survey than the pre-survey. See Table 1 for all findings related to the adjective measures.

*3.3. Student Perceptions of Older Adults and Aging*

Student responses to how their perception of older adults and aging has changed after volunteering as a mentor were sorted into three categories: "Improved perceptions," "already had positive perceptions of older adults," and "potentially some issues with working with older adults." Eighteen student responses indicated improved perceptions, while five students already had positive perceptions of older adults. For one student, the program did not seem to impact their perceptions of aging.

3.3.1. Improved Perceptions

Many students directly stated that the program contributed to a change in their perception of older adults. For those students who reported "improved perceptions," the following sub-themes emerged: (1) better understanding of older adults through experience, (2) learning that older adults are productive and contribute to society, (3) finding that older adults can learn how to use technology, and (4) increasing empathy toward older adults.

Seven student responses were coded as "better understanding of older adults through experience." These were responses where students described how the program promoted interactions with older adults that allowed them to better understand older adults and develop more positive perceptions of older adults. Students felt that the program also helped them better communicate with older adults and as a result, they were less intimidated by the idea of working with older adults. Through this experience, one student reported in their response:

> *"Somewhat, I have formed a clearer image of older adults. I have also come to the realization that I would like to work with older adults one day."*

Other examples of student responses are highlighted below:

> *"Absolutely! I felt before older people are difficult to work with, talk to, or create bonds with. However, after I realized I could learn a lot through older adults and create bonds that are close and connected."*

> *"Yes, my perception has changed. I haven't spent a lot of time around older adults and would feel like they can be a bit intimidating. After this experience, I realized that is not the case at all."*

Five students that reported improved perceptions specifically related to the theme "learning that older adults are productive and contribute to society." Through participating in this intergenerational program, college students no longer felt older adults were removed from society or unproductive. These students commented they were surprised to see older adults living fulfilling lives, participating in activities, and being active members of the community with unique interests. Supporting quotes from student responses are presented below:

> *"Yes, it has changed. She has showed me that age does not stop her from doing anything that she wants to in life. I now see that older generations can be just as productive, if not more productive than younger generations."*

> *"Yes, my partner is still active in the community and taught me a lot about what she is doing now as opposed to when she was younger."*

Three students improved perceptions of older adults related to the theme "finding that older adults can learn how to use technology." These students were surprised that older adults were capable and excited to use technology for advanced purposes. Below are the student responses:

> *"Yes, it changed because I got to know [that] older adults [are] doing advanced tech things and [it] was really good to see their enthusiasm during this program."*

> *"Yes. Older adults aren't always bad with technology because they choose to be, often times they just need extra encouragement and a helping hand to be more [tech-involved]."*

For three other students in the program, improved perceptions were related to "increasing empathy toward older adults." These students described the importance of having patience when teaching older adults about technology and the positive impact intergenerational interactions can have on older adults.

*"[It] has improved, and I have become more aware of my language usage (avoiding ageist terms)."*

*"It certainly has. Just today actually, I went out to breakfast they had outside seating with umbrellas over the table. An older gentleman who was eating alone tried to put the umbrella up but it didn't work for him, so I walked over and put it up for him. After that I realized that I really enjoyed helping him. I've always held doors for people and other little things but I feel like after getting to know my Cyber-Seniors partner and meeting a few older people at the local Senior Center, I know how much it means to them for someone to go out of their way and take the time to help them so it just makes it feel that much better after you do it."*

As a result, the program seems to promote intergenerational contact that may help college students get to know older adults and help breakdown stereotypes and preconceived notions college students have regarding older adults and aging.

### 3.3.2. Already Had Positive Perceptions or Potentially Some Issues

Five students in this program already had positive perceptions of older adults before participating in Cyber-Seniors. Some of these students attributed these preexisting positive feelings due to positive interactions with family members or due to previous experience with working with older adults, such as shown in this example quote:

*"No, my perceptions didn't change. I did get to meet someone out of my comfort zone besides my family."*

One student response indicated the experience did not result in more positive perceptions. This student reflected:

*"I feel that some older adults do not understand what college students are going through. A lot of times, I felt my match did not respect the effort I was putting in (by not reciprocating) and respect my limited time."*

### 3.4. Students Interest in Working with Older Adults

Before participating in our Cyber-Seniors program, 20.8% of students reported that they planned to work with older adults, while 54.2% of students were unsure or somewhat open to the idea of working with older adults. However, at the end of the semester, 33.3% of students reported that they planned to work with older adults, and 41.7% were unsure or somewhat open to the idea of working with older adults. The same students (25%) who were not interested in working with older adults before starting the program were still uninterested in working with older adults at the end of the semester. While there was no significant change in the number of students interested in working with older adults, the main change came from students who said they were unsure and then changed their response to "yes" in the post evaluation. See Table 2 for a summary of these findings. When comparing the actual pre- and post-responses (e.g., length of responses, content), pre-test responses were mostly vague, uncertain responses, where post-responses were much more rich, thoughtful, and lengthy. In post-responses, students more often acknowledged how the populations they work with will often be older adults. The following provides details related to the student responses.

**Table 2.** Pre- and post-differences among students interested in working with older adults.

| Level of Interest in Working with Older Adults | Pre-Intervention (*n* = 24) | Post-Intervention (*n* = 24) |
| --- | --- | --- |
| Yes | 5 (20.8%) | 8 (33.3%) |
| Unsure or Open to the Idea | 13 (54.2%) | 10 (41.7%) |
| No | 6 (25%) | 6 (25%) |

### 3.4.1. Interested in Working with Older Adults

Prior to participating in the program, five students were interested in working with older adults, and following the program, three additional students, or eight students total, reported they were interested in working with older adults (an increase of 60%). Of the initial five, four students were interested in working with older adults in a clinical capacity or as a healthcare provider, and one wanted to work as an activities staff member. Post-intervention, students provided more detailed responses as to why they wanted to work with older adults. Some responses were related to a specific clinical/professional trajectory, such as in the field of pharmacy, physical therapy, or case management. Students stated:

*"Yes! I want to work as a clinical gero-psychologist possibly at an adult day care center or a VA office."*

*"Yes, the activity planning at senior living facilities. In the future as a case manager."*

*"Yes, I would like to work in a nursing home type setting."*

*"In being an ambulatory care pharmacist, I hope to have many interactions with the older generation."*

An important finding for educational programs and policymakers to consider is that some students acknowledged that while they were not planning to specialize in older adult care while in school, they anticipated having to work with older adults in some capacity. Supporting quotes are provided below:

*"I am not sure if I would like to work specifically in geriatrics, but I am sure I will work with older adults to some extent."*

*"I'm not sure if I want to work with solely older adults, but I'm certain I'll be working with many older adults in the future."*

### 3.4.2. Possibly Interested in Working with Older Adults

On the pre-survey, thirteen students indicated they may be interested in working with older adults, whereas on the post-survey eight students stated possible interest. Student responses that indicated they were possibly interested in working with older adults were categorized as "unsure" and or "possibly in some capacity." Eight student responses were coded as "unsure," where students explained the career options they were exploring. Supporting quotes are summarized below:

*"I am not sure at this point. I would not be bothered to try, but it might not be something I will say yes to."*

*"I am not sure if I would rather work with older adults or young children."*

Five responses from students reported they may work with older adults. Specifically, these students mentioned how their career trajectory may require them to work with older adults in some capacity. Example quotes are summarized below:

*"I may have to work with older adults in my career. Society has been changing and as a school psychologist I may work with many grandparents who are raising their children or older adults who choose to have kids later in life."*

*"Not specifically, but I want to work in a community setting where there will be older adults."*

Post-intervention, fewer students, eight in total, communicated possibly wanting to work with older adults due to their experience in the program. Examples are highlighted below:

*"I have not decided on what area of pharmacy I would like to work in, but this experience made me more interested in geriatrics."*

*"Not sure but after this class I learned I am interested in maybe working with older adults."*

Other students described a possible desire to work with older adults in a broader sense, such as in a volunteer capacity.

### 3.4.3. Not Interested in Working with Older Adults

On the pre-survey, six students stated they were not interested in working with older adults. Some students did not elaborate on why they were not interested in working with older adults while others explained that their career plans entailed working with children. Supporting quotes are provided below:

*"No, but I do not have anything against working with them."*

*"I do not, I plan to work with foster kids."*

Post-intervention, the same students remained disinterested in working with older adults. These students already had plans to work with younger generations, such as children. Two of the six students reported that while they do not plan to work with older adults, they were open to the idea. One student stated:

*"No, I do not plan to work with older adults in my career, but if I did, I would not mind."*

## 4. Discussion and Conclusions

This study emphasizes the importance of intergenerational interactions in order to improve college students' attitudes towards older people. In support of the first hypothesis, that students' attitudes towards older adults and aging would improve following participation in an intergenerational service learning program, both quantitative and qualitative data from our study indicated that students' attitudes towards older adults became more positive following participation in the program. Students increasingly felt that older adults were active members of their communities. In support of the second hypothesis, that participation in the program would enhance students' interest in working with older adults, both quantitative and qualitative data from our study indicated that students were more open to the idea of working with older adults in their future careers, such as geriatric pharmacy practice. The results of our study demonstrate that intergenerational service-learning is an excellent tool in an education setting to increase students' understanding of and interest in aging-related careers.

Previous research has found that college students frequently hold negative stereotypes towards older people [22,24], essentially treating them as a homogenous group with poor physical and mental health. In our study, we found that while some students had negative attitudes towards older adults, most students felt positive about older adults prior to participation. Our study provides evidence that participation in this type of intergenerational service-learning, which incorporates reverse mentoring and teaching technology, can improve attitudes towards older adults and aging even among student participants who began with relatively positive views. Quantitative data from our study found that students' attitudes towards older adults became more positive following program participation. This included using fewer negative adjectives to describe older adults. Nearly all students had improvement or maintenance of previously positive perceptions of older people after participation in the Cyber-Seniors program. Therefore, continued use of these types of programs is encouraged. This study builds upon previous research on intergenerational programs, demonstrating that technology can be an effective medium in which to bring generations together and that programs

such as this can be promoted beyond university classrooms to help meet service-learning and experiential education requirements.

Society at large promotes ageist messages, and research shows that these messages can become internalized, which has negative consequences for older people themselves [38]. Our research data showed that some students also became self-aware of their own ageism, and awareness can help to break down some ageist stereotypes. As we know that these messages are learned when young, reducing ageism among young people can help them as they themselves get older. While university settings are providing increased opportunities for students to challenge these negative stereotypes of older adults, the reality is that systems of education from early childhood through high school should also be reformulated to avoid having children and youth internalize these negative stereotypes. While some prior programs and research have infused gerontology curriculum into middle and high schools [63,64], this is not very common or widely accepted across the world. We suggest that educational systems work to incorporate more positive images of older adults and aging. In addition, to avoid practices and programs that perpetuate negative stereotypes, such as the "Dress like you are 100" on the 100th day of school activity where students put on gray or white wigs, find a cane, and walk hunched over for the day.

Many of the students in our study were planning a career in a health-related field. We found that several students in the program indicated an openness to working with older adults in their future careers, particularly following participation in the program. However, the reality is that even on the post-survey, only about 1/3 of the students stated that they planned to work with older adults in the future. Previously research has shown that reducing ageism among health care providers can improve the quality of care for older people [41]. Our study strengthens previous findings that positive interactions with non-family older adults can increase students' interest in working in a geriatric field [50].

One important point, however, is that there were a number of students who were not necessarily interested in working with older adults, stating things such as "I *may have to* work with older adults in my career," acknowledging that they would probably work with older adults once they had a job in healthcare or human services. We find it unfortunate that these students do not simply say "yes" when answering this question or use words such as "may have to," especially if they know they will probably work with older adults once in their career because this appears that ageism is occurring where students are not proud or do not want to acknowledge they will work with older adults. Due to this, academic programs working to prepare future health and human service workers should require gerontology or geriatric courses and related service-learning experiences rather than have them listed as electives due to the reality that many will work with older adults but do not acknowledge this reality or do not choose to specialize in geriatrics or gerontology. Additionally, some students, even after participation in this program, state that they do not plan to work with older adults because they plan to work with children, when the reality is that even those who work with children often also work with older people. For example, one student in this study stated that they plan to work in foster care, and noted the reality of the foster care system where increasingly more grandparents are serving as foster parents and raising their own grandchildren [65]. Even these students would benefit from a gerontology class or service-learning experience with older adults to better understand the unique needs and opportunities of older people. More work is needed in this area, as improving attitudes is important for society overall. It is crucial that higher education prepare and motivate students to see a career path in working with older adults as viable and valuable. Further, students need to learn that demographic change (global population aging) will impact all industries, and therefore everyone should have some knowledge of the aging process and the challenges and opportunities of population aging.

Furthermore, programs should avoid having students in gerontology or geriatric classes or service-learning experiences only meet with older adults who are living in nursing homes or assisted living facilities because this could essentially perpetuate the negative stereotype that most older adults

are sick, disabled, frail, or in need. Rather, based on our experiences, we recommend that programs should ensure students are exposed to older adults from educational programs, such as the Osher Lifelong Learning Institute, senior centers, or fitness centers or programs. The reality is that individuals have diverse experiences within the aging process, with some people being quite frail and in need of extensive assistance in older adulthood and others being deemed "super seniors" who continue to be very physically active and/or take part in challenging athletic maneuvers, and everything in between.

In a 2018 article, Levy's PEACE model proposes that intergenerational programs that incorporate aging education, positive role models, and positive contact experiences with older people can help reduce ageism [56]. Our Cyber-Seniors program incorporates several aspects of this model as students receive the gerontology curriculum (education) at the same time that they are having positive and personal interactions with older adults from the community. The PEACE model also highlights the idea that the education piece and the interaction piece are interconnected, and, taken together, help reduce negative stereotypes of older adults more than each element would in isolation. The PEACE model posits that there are five optimal conditions for intergenerational programs. Of these, the Cyber-Seniors program clearly incorporates four of them: One-to-one, individualized interactions; cooperative interactions; sharing of personal information; and is sanctioned as part of a course and within a setting where older adults regularly interact. It could be argued that the program involves working towards a common goal—since the goal is more one-sided, for the older adult to improve technology skills; however, it could also be argued that students and older adults in the program are working towards individual goals of which the program is helping in both cases. In addition, it may be that a reverse mentoring program promotes unequal status during the interaction—with the college student as teacher and the older person as a learner, though many of the older participants in the program tend to provide suggestions and advice to students in the program regarding career or other personal matters [58]. Additionally, programs such as Cyber-Seniors are an outlet for students to foster communication, interpersonal, and information and communication technology skills; these skills are identified as some of the top employability skills by healthcare employers [48,66]. Students gain confidence in communication that can be applied to their future career, especially if pursuing a health profession degree. Furthermore, programs that decrease stereotypes and ageism may create ecosystems that promote health and well-being at individual, community, and societal levels.

Some potential limitations of our study deserve attention. Our relatively small sample size made us unable to analyze data by sub-groups, such as gender and major. However, one of the unique features of the program is that a small number of students providing a large number of service hours can actually support a large number of older persons each semester. Therefore, while this may be a small sample size for research, it is still important to examine outcomes for these groups of students because these students are making a big impact in assisting with an identified community need (in this case, helping ensure inclusion for older adults in the digital world). In addition, our post-test data were collected immediately following the program. It would be worthwhile to examine whether improved attitudes towards aging are maintained over a longer time period. This study could be utilized as a starting point for future studies that are focused on creating inclusive learning spaces to meet the needs of our diverse aging population. Further, there is a need for reconsideration of some of the scales used in this study as they were modified from other scales. We chose the Psychological Growth sub-scale from the Attitudes Towards Aging Scale [59] due to having face validity with the study definition of attitudes towards older adults and aging; we found some of the existing, well-cited scales used to assess ageism were not chosen in this study because of the negative wording of the questions, which may actually perpetuate ageism. Future research is needed to develop better quantitative measures. The qualitative measures in this study may be subject to social desirability bias, however, many students who felt that their perceptions about older adults were unaltered simply indicated that in their open response.

Future research in this area could also compare Cyber-Seniors to other programs and examine outcomes for students or older adults. Our analysis did not permit us to examine whether attitudes

improved because of the Cyber-Seniors program or because of gerontology education, so we recommend that future research compare students' attitudes of those who participate in the Cyber-Seniors program alone versus those who completed Cyber-Seniors in conjunction with gerontological courses/didactic training. Conducting a follow-up study on past Cyber-Seniors student mentors could elucidate whether attitudinal changes were sustainable over time or if students tended to resort back to more typical negative stereotypes about older adults and aging. In addition, new measures could be developed to further understand the benefits of the program related to students gaining experience with leadership, problem-solving, information communication systems, and professionalism. Further understanding the concept of intergenerational cohesion or conflict and how programs such as this contribute to these ideas is warranted. One example of this generational conflict is the trending hashtag #OKBoomer, which has created debate about generational understanding and interaction; and now, many of us are wondering what can and should be done to help create more intergenerational cohesion. Finally, future studies and programs should go beyond challenging negative stereotypes to replace negative images with representations of older people as active members of society—continuing to work, starting second careers, volunteering; studies that do this can facilitate civic and community engagement [67].

In conclusion, intergenerational programs such as the University of Rhode Island Engaging Generations Cyber-Seniors program should be implemented and promoted broadly for its enhanced potential to decrease negative aging stereotypes and contribute to greater interest and understanding in working with older adults. As society continues to age, there is more need to ensure older adults ensure equal and respectful treatment in employment, healthcare, and social life. Additionally, we must continue to provide programs such as Cyber-Seniors that provide students with opportunities for holistic and interdisciplinary learning to prepare them to engage in a digital and unpredictable ecosystem.

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