

**Impact Assessment of Music Engagement Programs  
and Vital Involvement Model on Low-income Elders in  
Subsidized Housing Communities**

**(working paper)**

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# **Impact Assessment of Music Engagement Programs and Vital Involvement Model on Low-income Elders in Subsidized Housing Communities**

## **Executive Summary**

1. A quasi-experiment was conducted to quantify the inferred-causal impact of the Art, Wellness and Vital Involvement in Aging (AWVIA) model via music sessions with very low-income older adults.
2. Weekly sessions over 3 months were led by exemplary professional musicians visiting with elderly residents at 10 HUD Section 202 properties located in Alabama, Connecticut, Indiana, Minnesota, and Texas. A total of 135 unique residents across 10 sites attended the weekly sessions. An additional 135 matched control subjects were drawn from 10 comparable properties that served as matched control sites.
3. Pre vs. post intervention measures across a wide array of physical, emotional, cognitive, and social engagement dimensions revealed significant positive effects of participation in the music sessions, particularly on outcome metrics that increase residents' chances of thriving in an independent living setting. Compared to matched control subjects, music participants reported improved sense of community, higher community trust and engagement, improved physical health, more physical exercise, better word recall, and less hopelessness and signs of depression. While matched control subjects felt older and experienced more severe chronic pain at post-intervention time point, the same declines were not observed among music participants.

4. Ripple effects were observed at intervention sites such that even residents who did not participate in the music sessions observed improvement in the general sense of community on site.
5. Evidence from this research could be instrumental in influencing HUD funding allocations to include arts engagement programs shown to improve health and wellness in low-income communities.

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# **Impact Assessment of Music Engagement Programs and Vital Involvement Model on Low-income Elders in Subsidized Housing Communities**

## **Research Background**

The primary goal of this research is to test and quantify the efficacy of the Art, Wellness and Vital Involvement in Aging (AWVIA) model music program delivered to low-income older adults living in affordable housing communities. Evidence from this research is urgently needed to build a case for funding from the U.S. Department of Housing and Urban Development (HUD) for arts programming that can improve health and wellness in very low-income housing communities. In the past fiscal year, HUD had disbursed \$749 million in housing assistance grants in support of the Section 202 and Section 811 programs. While HUD is invested in its mission to help residents continue to live in this independent setting, the agency does not currently fund any kind of arts intervention program in its housing projects. The main impediment is HUD lacks compelling evidence that arts programming can promote health and wellness among very low-income older adults, and thereby reduce the high costs of medical treatment and institutionalization.

This lack of evidence observed by HUD is a legitimate concern. Two recent literature reviews of research conducted with older adults actively engaged in dance, music, creative writing, theatre, or visual arts revealed evidence of positive outcomes in quality of life, emotional well-being, and cognitive functioning (Fraser et al. 2015; Noice et al., 2014). But they also noted that the vast majority of studies were not built on experimental design or standardized measurement. Furthermore, literature reviews cannot overcome the publication bias, whereby

researchers are more likely to seek publication of studies that produce positive or significant findings, while data with null effects are buried and forgotten.

In order to accurately evaluate the interaction of arts engagement programming on health and wellness of low-income older adults, we need documentation not only of explicitly effective arts interventions, but also of contextual and personal variables that influence both positive and negative outcomes. Older adults *live* with these contextual and personal variables, and HUD must support arts programming that takes advantage of them as this programming may vary across demographic populations. Today's older adults fall into a great many different categories in terms of current residence, past experience, social and support network, culture, current physical and psychological diagnoses, socio-economic status, and more. Research must provide a basis for arts programming that meets unique needs of elders in all these diverse groups.

Paradoxically, practitioners and programmers are also urged to attend to translational messages that may be useful in the real lives of older adults who do not necessarily meet all of the conditions of laboratory research. Gerdner warns that individuals do not live in laboratories. They may well have more environmental supports to be utilized than those identified or measured in clinical trials, and their individual profiles certainly include more variables than those measured and controlled for in clinical trials (2012).

In their 2015 scoping review Fraser et al. identified 17 categories that have been studied in terms of impact of the arts on the Quality of Life (QoL) that is often seen as a proxy for "health and wellness" (pp726-7). Conceptually, these may be lumped into four major categories that we consider as 1) Psychosocial (also including General satisfaction and well-being; Mental/emotional health [Feelings; Self-knowledge & values; Inner resources; Therapeutic/healing;



Sense of Direction/purpose]; Social [Legacy]; Psychosocial; 2) Physical Health (also including General/overall health; Therapeutic/healing); 3) Cognitive (also including Learning); and 4) Miscellaneous (including Spiritual/transcendental; Creative; Aesthetic; Recreational).

At the National Center for Creative Aging (NCCA) global leadership conference in Washington, DC, in September 2016, the first author presented an analysis of a large-scale nationally representative sample (drawn from the Health & Retirement Study 2014) that revealed a clear socioeconomic divide in creative aging – namely, that access to the creative arts is a social privilege of people who are more wealthy and educated, as illustrated in Figure 1 below.

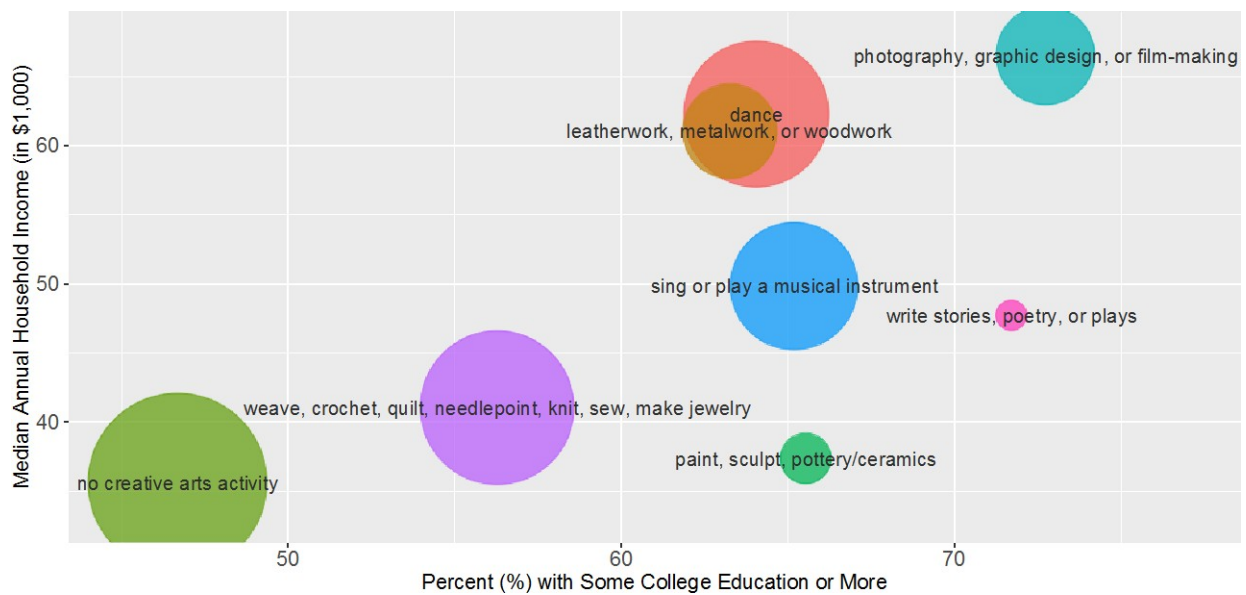


FIGURE 1: SOCIOECONOMIC DIVIDE IN CREATIVE ARTS PARTICIPATION AMONG OLDER ADULTS

More importantly, when older adults in the lowest income and education groups get to participate in the creative arts, they often manifest the most significant uplifts in well-being (Chang, 2016). Figure 2 illustrates how higher performance in word recall among older adults who weave, crochet, quilt, needlepoint, knit, sew, make jewelry etc. compared to their peers who do not engage in these creative crafts.

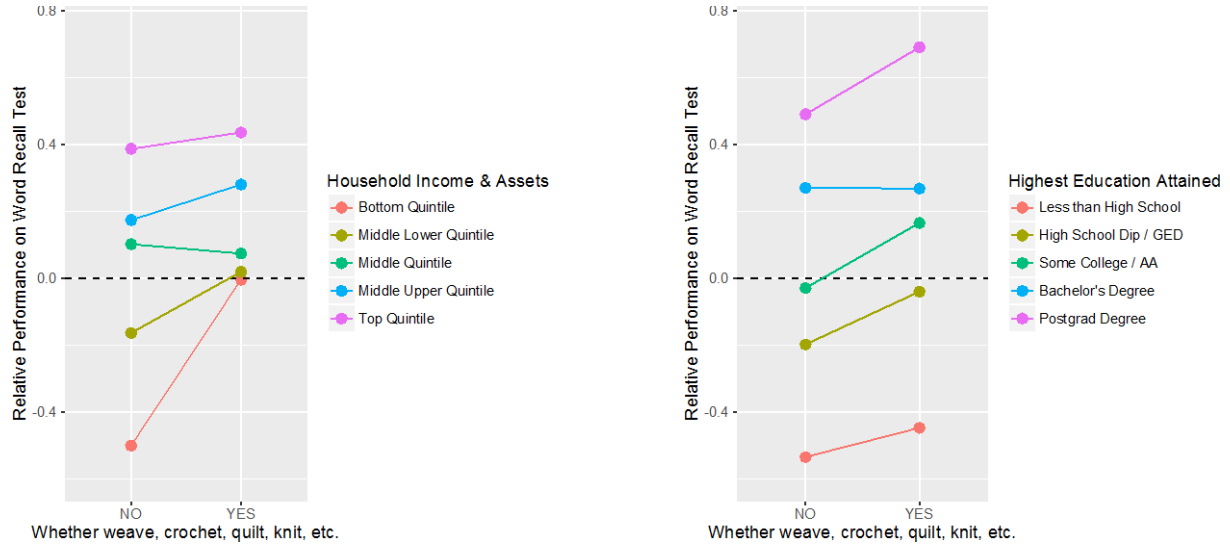


FIGURE 2: COMPARING WORD RECALL TEST PERFORMANCE BY SES QUINTILES

Figure 3 illustrates more positive self-assessment of own health among older adults who dance vs. those who do not dance.



FIGURE 3: COMPARING HEALTH STATUS BY SES QUINTILES

Figure 4 illustrates higher performance in serial 7's test among older adults who do leatherwork, metalwork, or woodwork, compared to their peers who do not. These findings

suggest that older adults who have very low-income could benefit from the creative arts as much as, if not more so, than their more privileged peers.

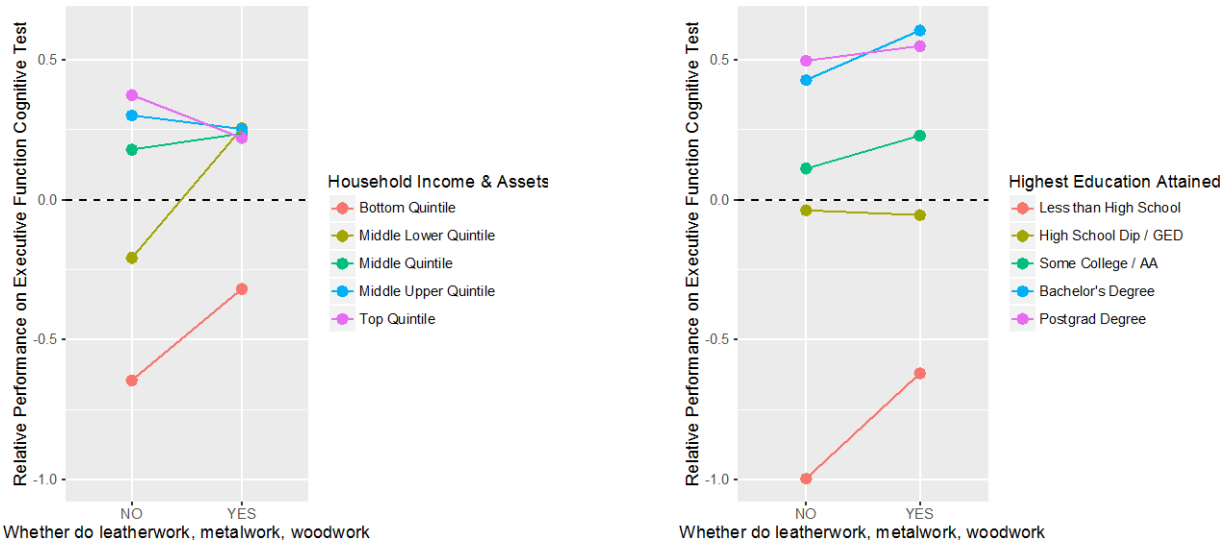


FIGURE 4: COMPARING COGNITIVE FUNCTIONING BY SES QUINTILES

An increasing body of research confirms physical and mental health benefits to older adults from interactive arts participation (particularly music) (e.g., Castora-Binkley et al., 2010; Fraser, 2015; Noice, 2009). The importance of interaction in positive outcomes of music interventions is widely documented among older adults with dementia (Gerdner, 2012; deMedeiros & Basting, 2013; Sakamoto et al., 2013; Ray et al., 2017; Danila et al., 2018; Leggieri et al., 2019). Life-cycle theorists have long maintained that arts participation is not only therapeutically “healing” for pre-diagnosed individuals, but – perhaps even more important – is psychosocially “wholing” for all individuals (Kivnick and Erikson, 1983).

The Aging, Wellness and the Arts (AWA) model was developed in 2009 to address the debilitating despair and loneliness often found in communities of older adults who are isolated, experiencing illness and depression, and whose health, mobility or economic circumstances result in very low social engagement. (Duncan Davis, 2009). AWA’s approach is modeled after the Creativity and Aging study conducted by the late Dr. Gene Cohen. In 2013, Helen Kivnick,

PhD., Professor of Social Work at the University of Minnesota, and Linda Duncan Davis, Gerontologist, founded an informal collaboration to enhance creative wellness among residents living in 90 Affordable Senior Housing Communities. The two recognized the potential -- complementarity of their two approaches and combined them to create the Art, Wellness and Vital Involvement in Aging (AWVIA) model. AWVIA is grounded in the longstanding developmental principle that Vital Involvement (VI) -- defined as meaningful reciprocal engagement with the world outside of the self -- is essential to psychosocial health at every stage of the life cycle (Erikson et al., 1986; Kivnick, 2005; Kivnick, 2010; Kivnick & Pruchno, 2010; Kivnick & Stoffel, 2005; Kivnick & Wells, 2014).

Over the past 4 years, arts programming under the AWVIA model has been introduced on site at 13 Section 202 housing projects around the country. Seventy five service coordinators have been trained in Vital Involvement Practice; they have, collectively, submitted roughly two thousand qualitative narratives exemplifying the perceived benefits for residents of having VI promoted by an on-site Service Coordinator. Those narratives are currently being coded and analyzed. Preliminary qualitative analysis indicates the presence of five dimensions of VI: 1) Enacting personal values; 2) Person-environment reciprocity; 3) Utilizing environmental supports; 4) Enriching the environment; 5) Experience-based perspective (Kivnick et al, under review).

AWVIA arts programming is conducted by vetted teaching artists, who provide low income elders with the opportunity to experience the arts and creativity; community Service Coordinators supplement these teaching artists. AWVIA arts programming reflects the diversity of people served, encourages open participation, and addresses the needs and interests of the residents. Skilled in addressing the needs and interests of older adult learners, these professional artist-facilitators are adept at making arts participation accessible to persons diverse in cultural and educational backgrounds. They encourage the residents' open and interactive participation,

successfully engaging even those with no prior experience or stated interest in art making. This report presents the first quantitative data collected to demonstrate impact of AWWIA programs in Section 202 housing sites.

Although several arts modalities can be integrated into the AWWIA model, our team selected Songwriting Works (SW) as the arts engagement program to include in this quasi-experiment, building on recent research that indicates powerful, positive connections between music activity and the brain, particularly for older adults diagnosed with depression; anxiety, and chronic pain (e.g., Cheever et al., 2018). SW began as an artist-in-residence project serving ethnically diverse communities of elders (San Francisco Institute on Aging/Artworks/UCSF, 1990). Now in its 26th year, SW has expanded to serve more than 3,400 older adults across 14 U.S. states as well as train hundreds of professional and family/kinship care providers.

SW is a particularly good fit for our diverse sub-population of very low-income elderly people, many of whom are reported by Service Coordinators as experiencing all of these difficulties. SW's mission is to restore joy, hope, health and community through song, including composition, performance and overall musical engagement. In addition, this particular music engagement program involves the intentional personal attention to individual participants that both mirrors the person-centered care that is increasingly recognized as important for 21st century health care (Talerico et al., 2003), and that also includes the interaction element identified as particularly effective in several music interventions (e.g., Gerdner, 2012; Leggieri et al., 2019).

By law, HUD cannot fund arts programming that are basic “arts and crafts” activities led by untrained artists. To ensure that our study program is led by professional artists of the highest caliber, all musicians recruited for facilitator training and participation in this project were required to have at least 3 years of demonstrated excellence in composing, performing and teaching music and at least 3 years of experience facilitating programs or otherwise directly engaging in music-making with older adults. For this study, 6 master musicians from diverse regions around the country attended an in-person training focused primarily on the Songwriting Works method, with an introduction to the core tenets of the AWWIA model and its VI component. Subsequent training of the AWWIA model then took place via 6 1-hour web modules, and regular on-line group meet-ups to address any comments and questions from the master teaching musicians.

The key research hypothesis in this study was to test whether the weekly music engagement programming conducted in affordable housing communities led to significant well-being of residents in terms of their extent of community engagement, physical health, cognitive functioning, and emotional well-being; as well as critical outcome measure of aging in place statistics routinely tracked by HUD in bi-annual reports. Details on measures and analyses are provided in the next chapter on Methodology.

## Method

Experiments are the backbone of causal inference. True random assignment to conditions, followed by best practices to maintain equivalence of conditions along extraneous variables, is the most compelling and conclusive research method to establish causality. However, real world settings often do not permit the high level of control we can maintain in strictly controlled laboratories. In our proposed study, selection of the 10 intervention sites were guided by practical considerations and budgetary constraints, and residents in the intervention sites cannot be forced to participate in the collective music engagement sessions. Because subjects cannot be randomly assigned to the treatment vs. control conditions, our study is a quasi-experiment.

Causal inference from quasi-experimental designs can be strengthened by taking concurrent measurements of a matched control group (Rubin, 1973). By matching treatment subjects to control subjects with similar attributes, we can test and quantify the treatment effect with minimal confounds. The Section 202 Resident Database permitted us to run matching algorithms to select closest match control for each treatment subject on attributes including but not limited to sex, age, race, income, education, and difficulties with activities of daily living (ADLs) such as walking, getting into and out of a chair, getting out of bed, go to the toilet, bathe, dress, groom, and eat, etc. Each individual resident is assessed on his/her ADL status when they first moved into the community, and then assessed annually based on the date they moved in. All previous years' scores can be retrieved and used in matching. Matched control subjects provide stronger basis for causal inference, because when we maximize equivalence between treatment and control groups along extraneous variables, then positive outcomes can be more clearly attributed to the treatment intervention. In short, a quasi-experiment with matched controls is a simulation of an experiment with true random assignment, and thus was the most appropriate

approach to tackle the research question.

### Research Participants

The sample for this research was drawn from older adults dwelling in 1 of 20 HUD Section 202 housing properties for very low-income elderly persons. The majority of residents live alone in 1-bedroom apartments; married couples share similar 1-bedroom apartments. The 20 properties include 10 intervention sites where weekly music sessions were held for 3 consecutive months, and 10 matched control sites where residents received no exposure at all to on site music activities. The properties were matched on commonalities on site parameters including geographic region (e.g. midwest vs. northeast), median age, gender ratio, racial composition, percent of frail residents, and percent of married residents. Two intervention sites in Houston, TX were matched to 2 control sites in the same city; as were 2 intervention sites in Mobile, AL. Two intervention sites in Indianapolis, IN were matched to 2 control sites in St. Louis, MO. Two intervention sites in Bloomington, MN were matched to 2 control sites in Ankeny, IA. Two intervention sites in Waterford and Groton, CT were matched to Niantic and Norwich, both in CT.

### Key Measures of Well-being

Impact assessment requires comparison on a wide array of measures tapping into older adults' sense of well-being. The four core sets of measures in this study covered most of the categories identified by Fraser et al. (2014) and included:

- Community engagement: sense of community, perceptions of neighbors and neighborhood, including the extent to which people in the community help each other out, extent to which there are people one could count on in this community the extent to which people in this community can be trusted, and perceptions of the degree to which there is a close-knit community on site.



- Physical health: self-assessed health status, self-perceived age (“what age do you feel you are today?”), common chronic conditions, chronic pain, sleep issues, hearing, exercise, smoking, alcohol intake, need for prescription medications, etc.
- Cognitive functioning: self-assessed functioning, as well as objective tests of word recall, numeracy, and the Serial 7’s subtraction test.
- Emotional well-being: depression, anxiety, worry and fears, anger, fatigue, feelings of worthlessness, hopelessness, loneliness, regret and emotional distress, as opposed to sense of purpose, internalization of the social stigma of aging, feelings of joy, hope, self-efficacy and mastery. In line with AWWIA principles, residents were asked the extent to which core values are important to them, such as creative self-expression, connection with others / helping, personal growth, tradition, justice, honesty, responsibility, achievement / status, and simply experiencing life's sweetness.

The vast majority of measures were based on established psychometric scales and metrics with proven reliability and validity, with associated benchmark norms from large-scale national samples. Measures of physical well-being and emotional well-being were adapted from the National Health Interview Survey (NHIS) and the Health and Retirement Study (HRS); measures of cognitive functioning were taken mainly from the HRS; and measures of community engagement were taken mainly from both the aforementioned surveys as well as the American Housing Survey (AHS).

It was our explicit intent to test for benefits across a wide range of wellness and QoL metrics, instead of prematurely limiting ourselves to a few outcome measures. However, it was not our intent to cherry pick and report only on outcome metrics that yield positive effects. In fact, it is in our interest to fully document the varying magnitude of effect sizes across a wide range of wellness and QoL metrics, especially those dimensions that affect older adults' chances of thriving in an independent living setting. Our measures cover the wide range of categories identified by Fraser et al, described above.

Finally, to round out the analysis, there is one additional critical outcome measure that we computed from raw data retrieved from the Section 202 Resident Database after the program ends on site. Three months after the AWWIA program ended, we collected data from both engagement and control sites on which residents departed from the housing site, and the reason for departure. If the resident moved to a higher level of care in skilled nursing facilities, this was coded as a negative outcome. If the resident remained in the housing site or passed away while still a resident, this was coded as a positive outcome because they were "aging-in-place" in an independent living setting. This analysis is in line with HUD policies and directly addresses HUD priorities, but was clearly a long shot given how the effect on residents' odds of "aging-in-place" may not be apparent within the short time frame of this study, and may not be detected within the study sample size. Hence, our primary outcome instruments measured the aforementioned QoL variables that maximize older adults' chances of thriving in an independent living setting.

### **Data Analysis**

The statistical approach used for analyzing the pre vs. post intervention data was repeated measures analysis of variance (ANOVA) with between-subject factors. The primary between-subject factor is the group, i.e. intervention vs. control identifier. In addition, we include age as a

between-subject factor to examine whether the main effect varied by residents age 75 or younger vs. residents over 75 years old, i.e. interaction effects. We did also examine gender differences and found no effect, though it is possible that gender differences were harder to detect given how the research sample was 87% female and only 13% male.

A well-designed experiment will attain high internal validity (i.e. causal inferences about treatment effects) but will not automatically attain high external validity, i.e. the extent of generalizability of the treatment effects. Interaction effects in factorial designs can expand generalizability efficiently because they support concurrent testing of both main effects and interaction effects between experimental factors, e.g. a 2 (Intervention Group vs. Control Group) x 2 (Younger than 70 vs. 70+) factorial design. All analyses were conducted on the R statistical computing platform.

### Data Collection Protocols

In January 2018, baseline data was collected concurrently from residents at 10 intervention sites and 10 control sites. Music sessions were conducted at the 10 intervention sites from February to April 2018; and the post-intervention data was collected in May 2018. Both the baseline and post-intervention surveys were vetted and approved by the Human Research Protections Program (HRPP) at the University of Indianapolis. Service Coordinators on site were trained on proper interviewing techniques that reflect ethical conduct of human subjects as well as how to collect standardized data with minimal bias. All service coordinators attended a live group class online, followed by dyadic practice sessions where they took turns to role play and administer the data collection tools.

## Results

### Music Session Attendance

A total of 135 unique residents across 10 sites attended the weekly sessions. It was apparent that some residents loved the music sessions while others did not take to it much. As shown below, about 1 in 4 participants attended one music session and never came back; but about 1 in 4 residents attended the music sessions all 10 times. The remainder of residents fell somewhere in between.

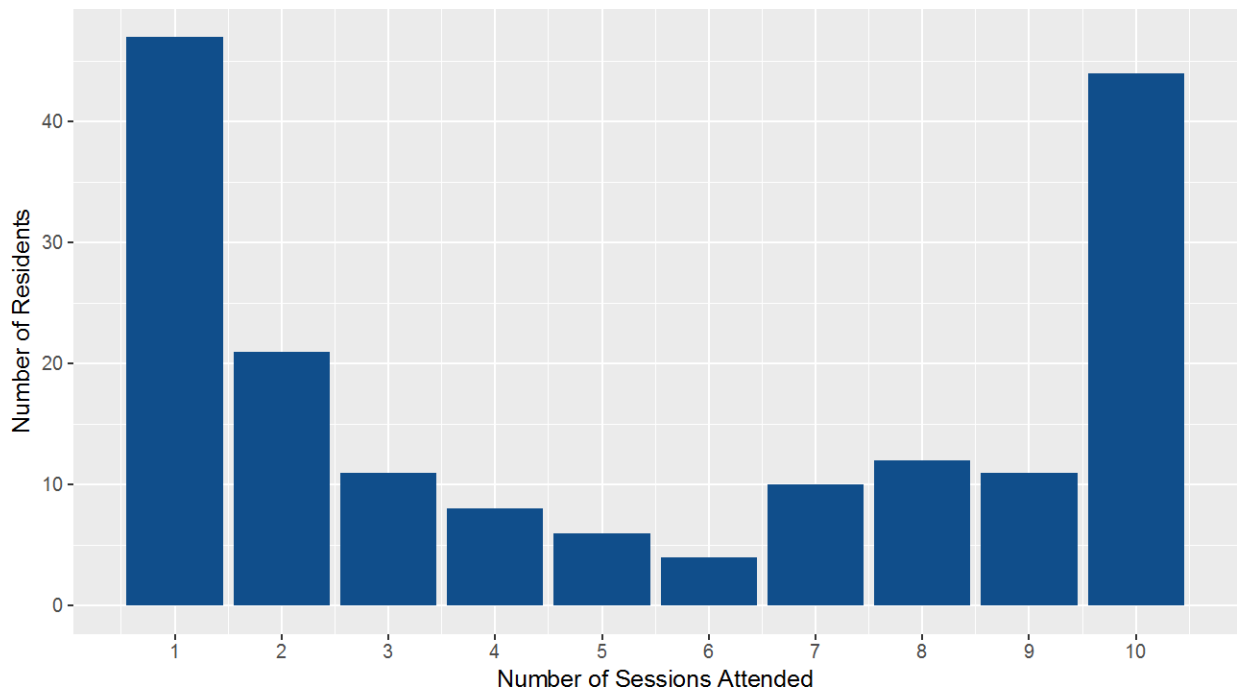


FIGURE 5: FREQUENCY OF PARTICIPATION IN WEEKLY MUSIC SESSIONS

Comparisons across the 10 intervention sites also revealed substantial differences in residents’ engagement with the music sessions. Specifically, residents at sites G, H, and I were on average attending the music sessions a lot more often (median is indicated by bold black line in box plot) whereas Site A had the fewest engaged residents.

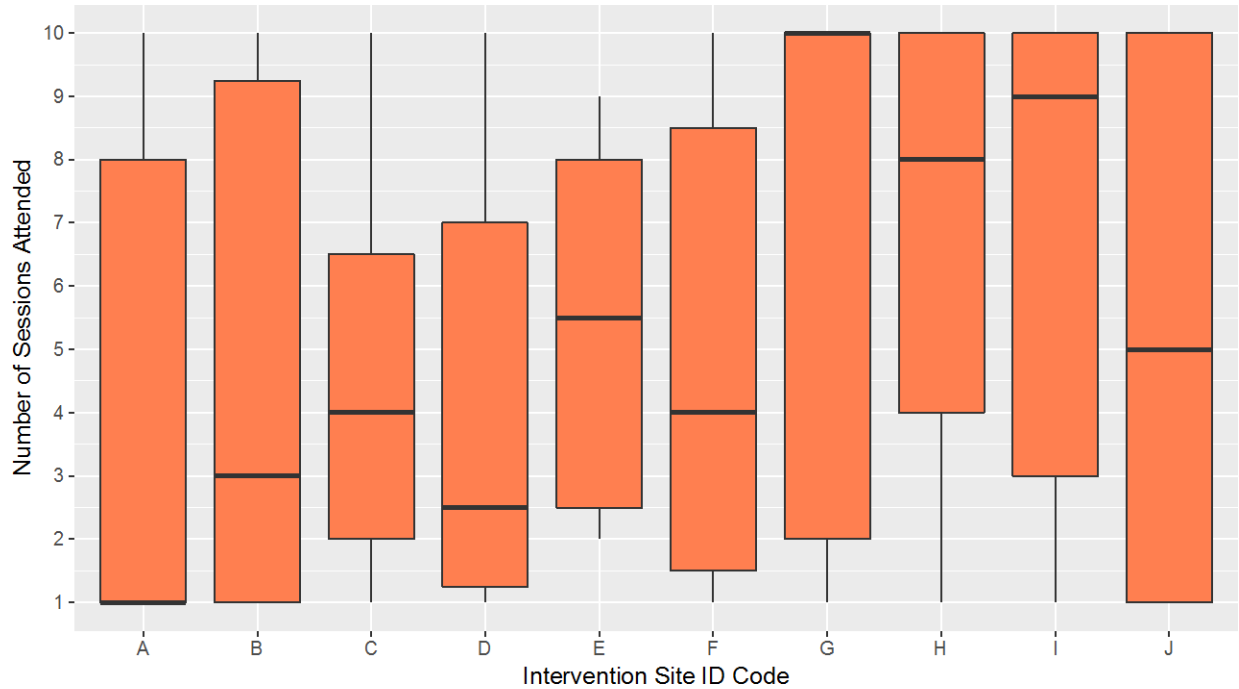


FIGURE 6: FREQUENCY OF PARTICIPATION IN WEEKLY MUSIC SESSIONS BY SITE

### Community Engagement

In order to make causal inferences of the impact of music participation, 135 matched control subjects were drawn from the 10 control sites. The control subjects were matched to the 135 music participants based on individual attributes including gender, age, race and ethnicity, education, marital status, and self-assessed personal health status. Controlling for these individual attributes as well as site characteristics allows us to make inferences about what these residents would have experienced if they did vs. did not have the opportunity to participate in weekly music engagement programs. Data from these 270 residents were collected at 2 points in time –once at baseline in January 2018 prior to the launch of music sessions, and once in May 2018 after the end of the music engagement program.

Community engagement was assessed with a general measure of perceived change; as well as a 4-item composite index taken at baseline as well as post-intervention time points. The

general measure of change simply asked residents - compared to January 2018, has the sense of community in the building gotten better today, about the same, or worse? Results are shown in the figure below. Music participants reported significantly improved sense of community more so than controls before vs. after intervention, X-squared = 26.2,  $p < 0.001$ .

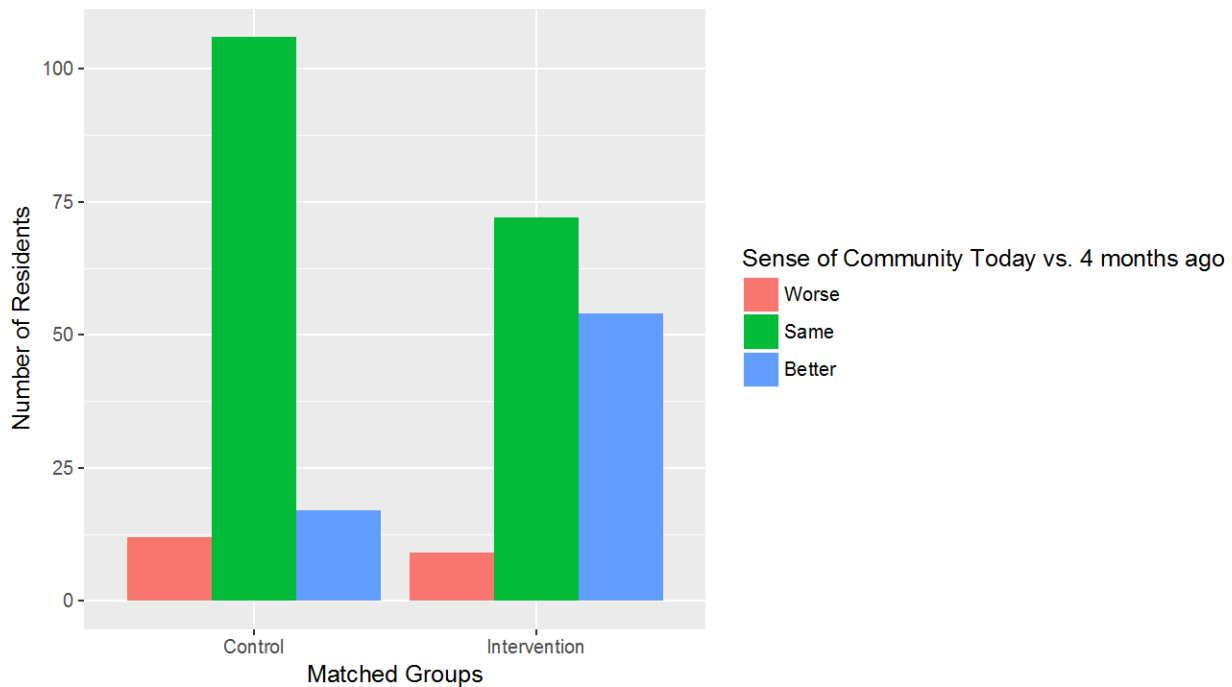


FIGURE 7: PERCEIVED CHANGE IN SENSE OF COMMUNITY

The 4-item composite index included the extent to which people in the community help each other out, extent to which there are people one could count on in this community, the extent to which people in this community can be trusted, and perceptions of the degree to which there is a close-knit community on site. These 4 items were correlated between 0.39 to 0.53; and yielded a satisfactory Cronbach's alpha of 0.77 (lower bound alpha = 0.74, higher bound alpha = 0.80 at 95% confidence interval). Hence these 4 items were combined to form one composite index of community trust and engagement. These items were measured twice – once at baseline, and once at post-intervention – in order to detect any changes in residents' perceptions of community trust and engagement. A positive effect emerged on this index, such that music participants reported

significantly improved sense of community than controls before vs. after intervention, 2-way Time x Group Interaction  $F = 3.54, p < 0.06$ . As shown in figure below, intervention site residents showed significant uplifts in their perceptions of community trust and engagement, while control site residents showed no significant change in perceptions. Although the effect sizes suggest more pronounced impact on residents over 75 years old than residents 75 or younger, the interaction effect with age did not reach statistical significance, 3-way Time x Group x Age Interaction  $F = 0.12, p > 0.70$ .

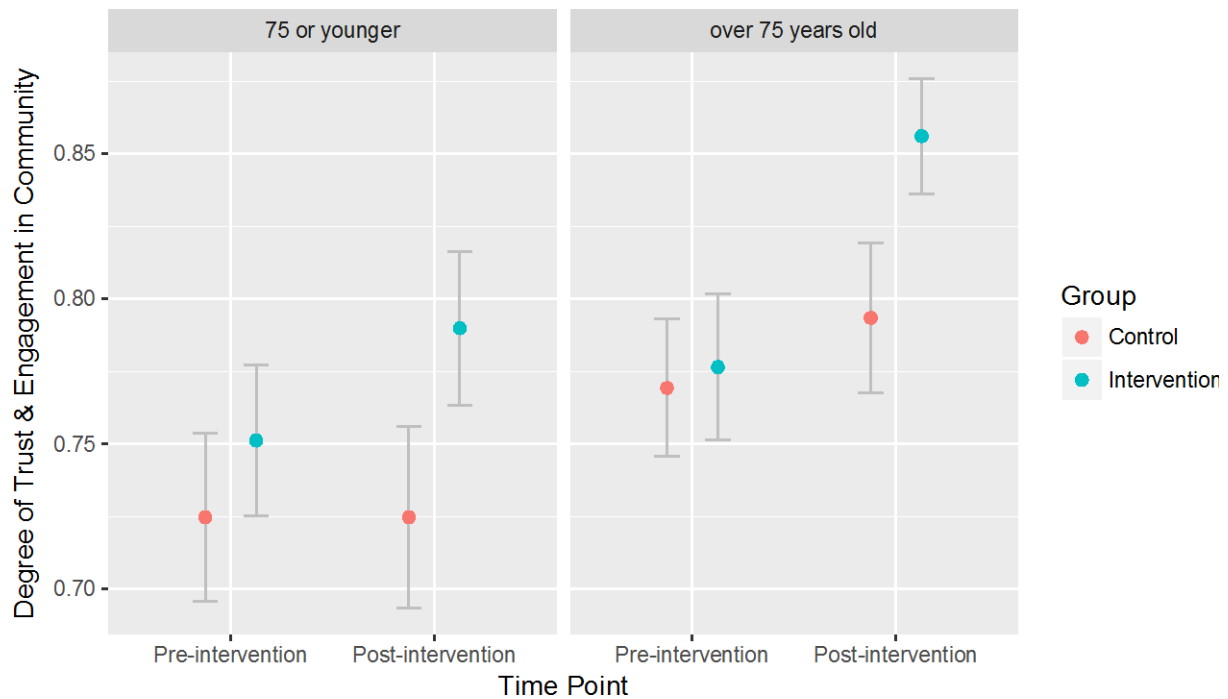


FIGURE 8: COMPARING COMMUNITY ENGAGEMENT PRE VS. POST INTERVENTION

### Physical Health

Physical health was also addressed with a general measure of perceived change in self-assessed health status; as well as repeated measures of self-perceived age, common chronic conditions, chronic pain, sleep issues, hearing, exercise, smoking, alcohol intake, need for

prescription medications, etc. The general measure of change simply asked residents compared to January 2018, has their health gotten better today, about the same, or worse? Results are shown in the figure below. Music participants reported significantly improved health more than controls before vs. after intervention, X-squared = 13.1,  $p < 0.001$ .

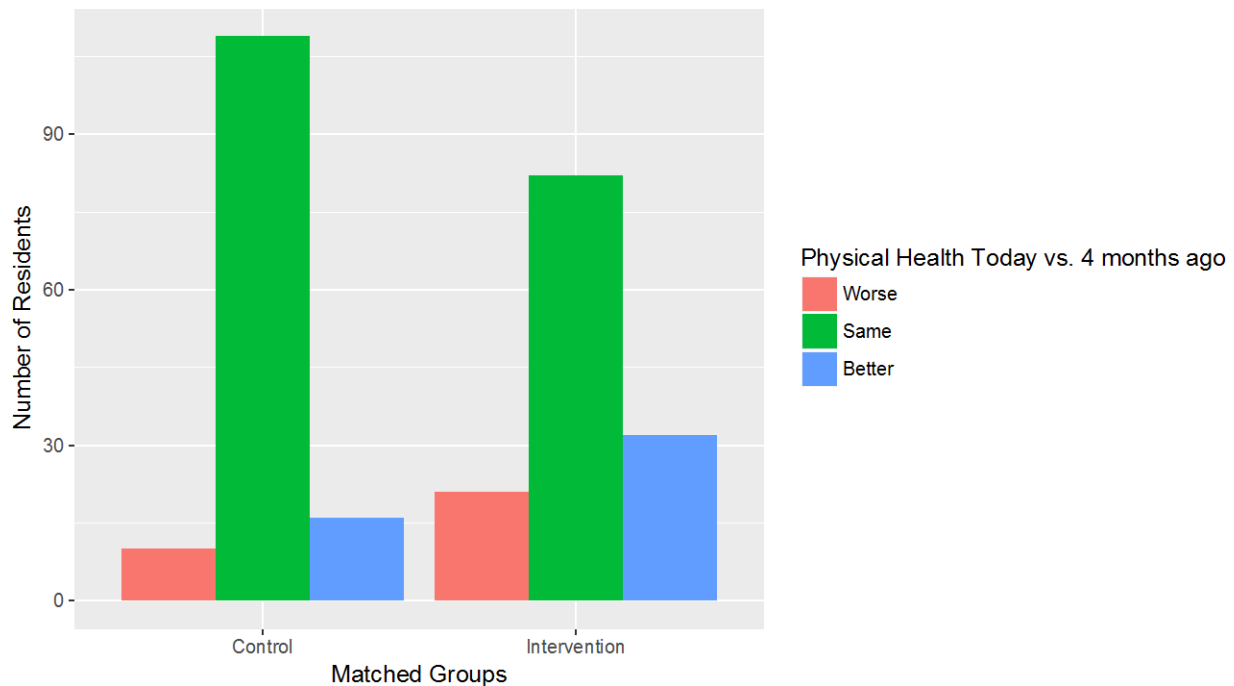


FIGURE 9: PERCEIVED CHANGE IN SELF-ASSESSED PERSONAL HEALTH

Another measure of perceived physical well-being is to ask people what age they feel they are at today, regardless of their actual age. This item was measured twice – once at baseline, and once at post-intervention – in order to detect any changes in residents’ perceptions of their own age. Although no significant positive effect emerged on this measure for intervention subjects, a significant negative effect was observed among the matched control subjects, such that control subjects younger than 75 felt older at the post-intervention time point, pairwise contrast  $t = 56.6$ ,  $p\text{-value} < 0.001$ . This effect suggests that even though regular music activities



did not make residents under 75 feel younger, it is likely that they would have felt older in the absence of those activities.

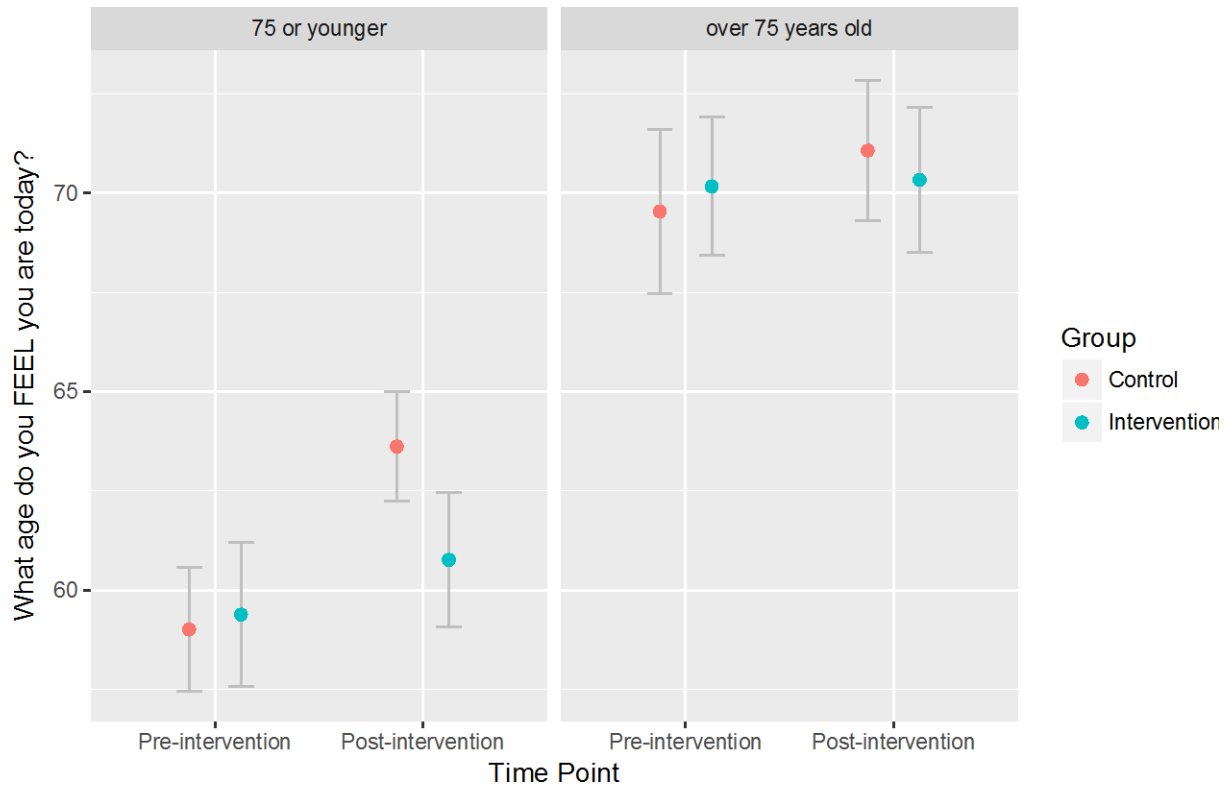


FIGURE 10: COMPARING PERCEIVED AGE PRE VS. POST INTERVENTION

A similar effect emerged on the measure of chronic pain. All subjects 75 or younger reported less chronic pain post intervention, reflecting no intervention effect for this age group. Although no significant positive effect emerged on this measure for intervention subjects older than 75, a significant negative effect was observed among the matched control subjects, such that control subjects older than 75 reported more severe chronic pain at the post-intervention time point, pairwise contrast  $t = 1.98$ ,  $p\text{-value} < 0.05$ . This effect suggests that even though regular music activities did not make residents feel less pain, it is possible that those older than 75 could

have felt more pain if they had not had the opportunity of participating in music programming on site in their communities.

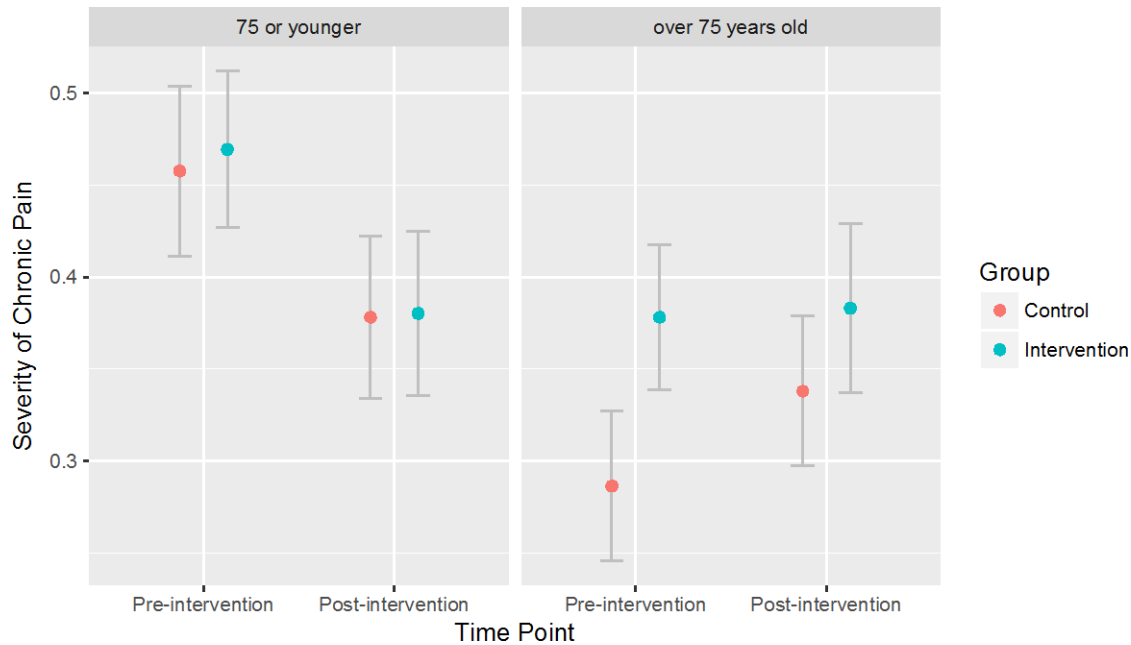


FIGURE 11: COMPARING CHRONIC PAIN PRE VS. POST INTERVENTION

A strong intervention effect emerged on the measure of physical exercise, regardless of age groups. Music participants at the intervention sites reported engaging in more moderate exercise than control subjects – i.e. they reported more days in the past week “when you had walked or exercised or moved in ways that caused light sweating, or moderate increase in breathing or heart rate,” 2-way Time x Group Interaction  $F = 7.99, p < 0.005$ . Figure 12 illustrates these differences between the 2 groups at the 2 time points of interest – at January 2018 baseline prior to launch of music sessions, both intervention and control groups showed about the same levels of moderate physical exercise. In contrast, in the post-intervention time point of May 2018 after they had participated in regular music sessions, the intervention subjects reported elevated levels of moderate physical exercise, compared to both control

subjects as well as their own baseline 3 months ago. This uplift in physical activity was evident in both age groups and therefore not moderated by age at all, 3-way Time x Group x Age Interaction  $F = 0.27, p > 0.60$ . In short, the elevated levels of moderate physical exercise among intervention subjects is a robust effect regardless of age.

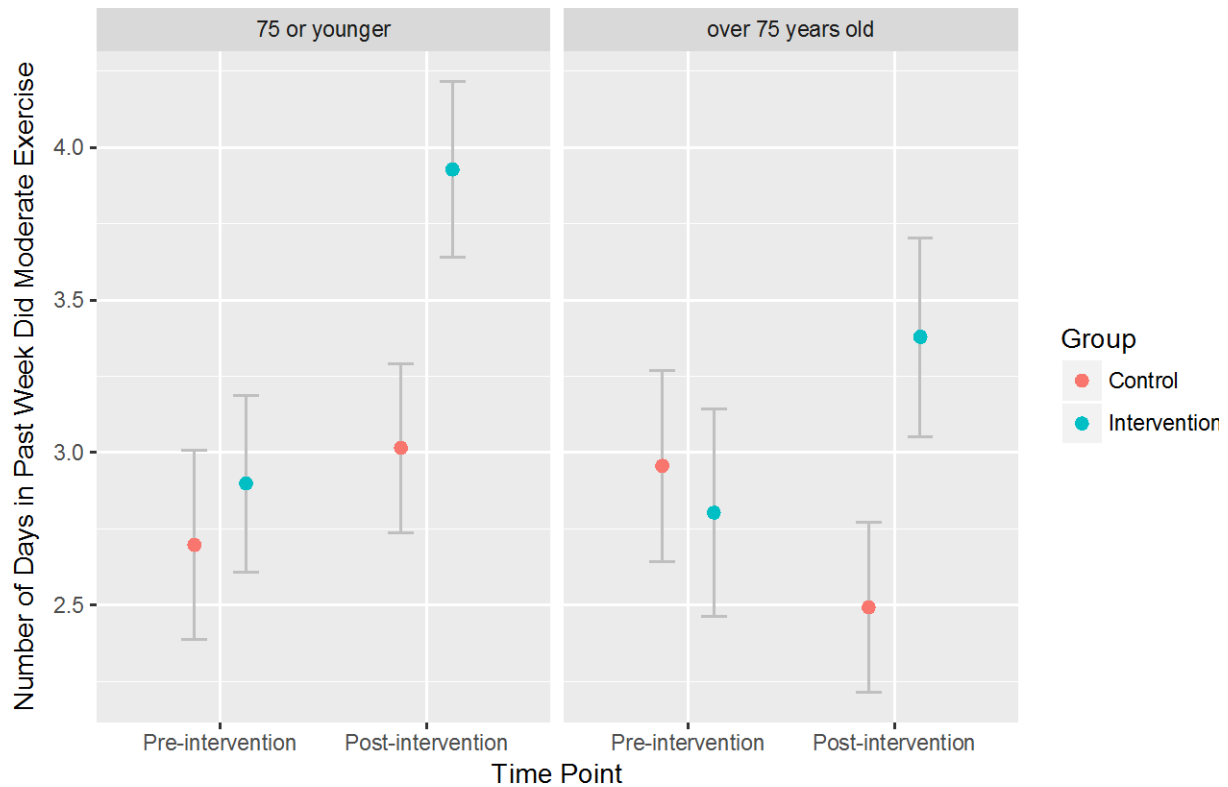


FIGURE 12: COMPARING PHYSICAL EXERCISE PRE VS. POST INTERVENTION

### Cognitive Functioning

Cognitive functioning was also captured on a general measure of perceived change in self-assessed memory; as well as repeated objective tests of word recall, numeracy, and the Serial 7’s subtraction test. The general measure of change simply asked residents compared to January 2018, has their memory gotten better today, about the same, or worse? Output revealed no significant difference between intervention vs. control subjects ( $p > 0.30$ ) implying that the

two groups did not differ in their perceptions of whether their memory had improved or declined over the past 3 months.

At both pre-intervention and post-intervention time points, residents were tested on their actual word recall based on a standardized test routinely used in the Health & Retirement Study. In essence, the interviewer reads out a set of 10 simple words, and then ask the respondent to try to recall aloud as many of the words as they can, with assurances that most people recall just a few words in order to alleviate performance anxiety. Different set of words were used at pre-intervention and post-intervention time points, but the same set of words were asked across intervention and control subjects. As shown in Figure 13, a significant intervention effect emerged on this measure, such that intervention subjects age 75 or younger showed marginal improvement in their word recall, 3-way Time x Group x Age Interaction  $F = 3.49, p < 0.06$ .

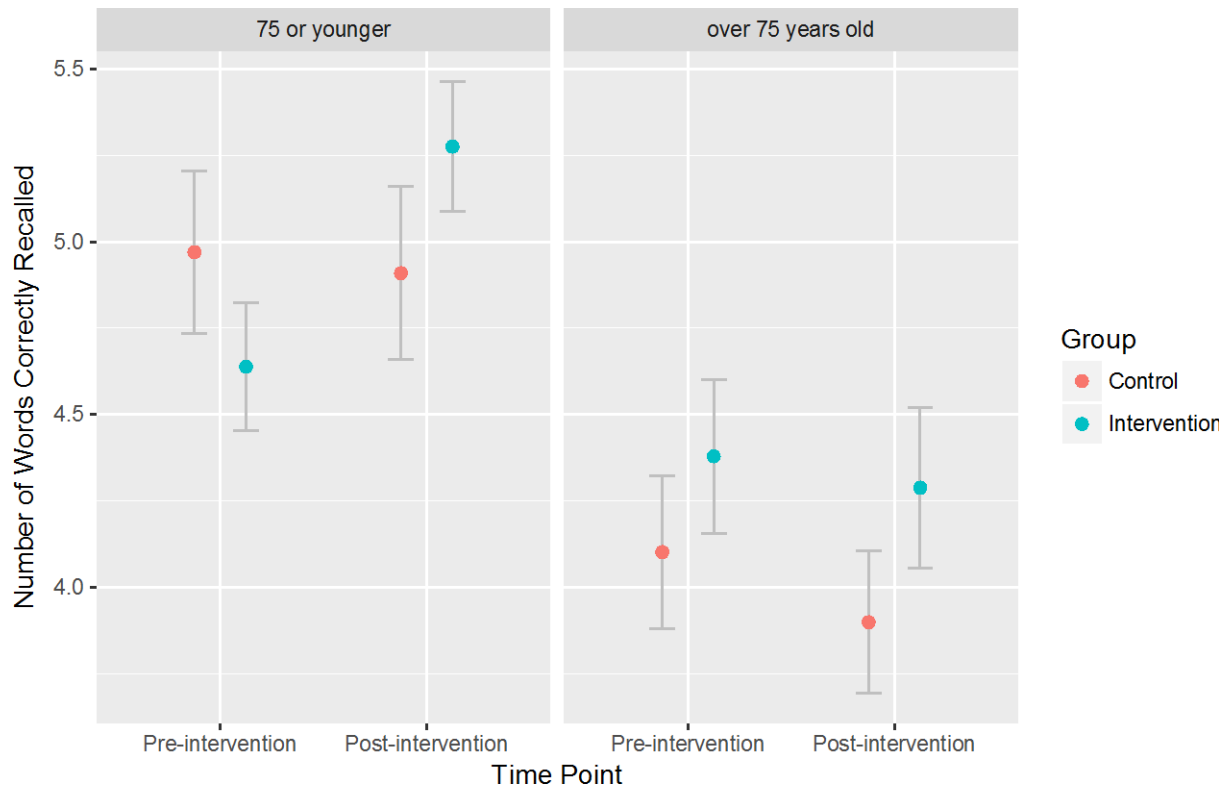


FIGURE 13: COMPARING WORD RECALL PRE VS. POST INTERVENTION

However, the intervention effect on word recall was the only observed effect among measures of cognitive functioning. Intervention and control subjects showed no other difference on other objective tests of numeracy and executive functioning, implying no evident benefit of music engagement sessions on those measures, all  $p > 0.50$ .

### Emotional Well-being

Emotional well-being measures included asking how often residents felt depression, anxiety, worry and fears, anger, fatigue, feelings of worthlessness, hopelessness, loneliness, regret etc. during the past 30 days. These measures were repeated at both pre-intervention and post-intervention time points to test whether participation in the music sessions would reduce frequency of emotional distress.

A positive intervention effect emerged on feelings of hopelessness. Music participants at the intervention sites felt hopeless less often than control subjects at post-intervention, 2-way Time x Group Interaction  $F = 5.19, p < 0.05$ . Figure 14 illustrates these differences between the 2 groups at the 2 time points of interest – at January 2018 baseline prior to launch of music sessions, both intervention and control groups felt hopeless at roughly the same levels of frequency. In contrast, in the post-intervention time point of May 2018 after they had participated in regular music sessions, the intervention subjects reported lowered frequency of feeling hopeless, compared to both control subjects as well as their own baseline 3 months ago. This uplift in hope, or decrease in feelings of hopelessness, was evident in both age groups – 75 or younger, and over 75 years old.

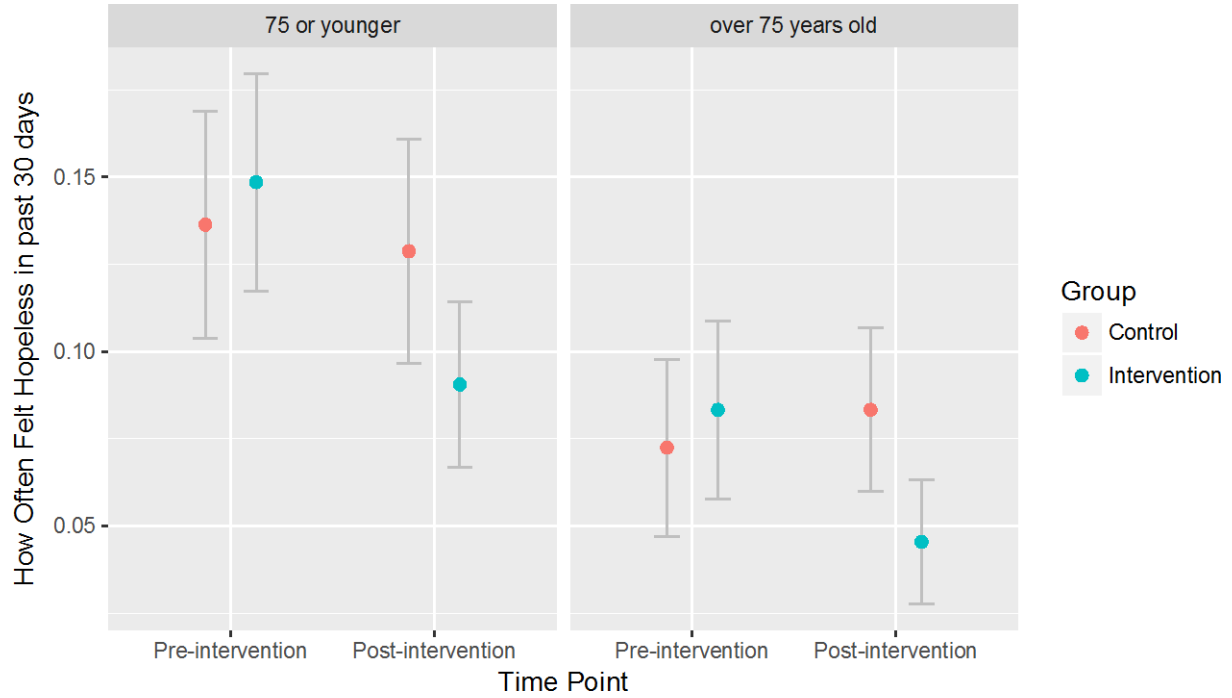


FIGURE 14: COMPARING FEELINGS OF HOPELESSNESS PRE VS. POST INTERVENTION

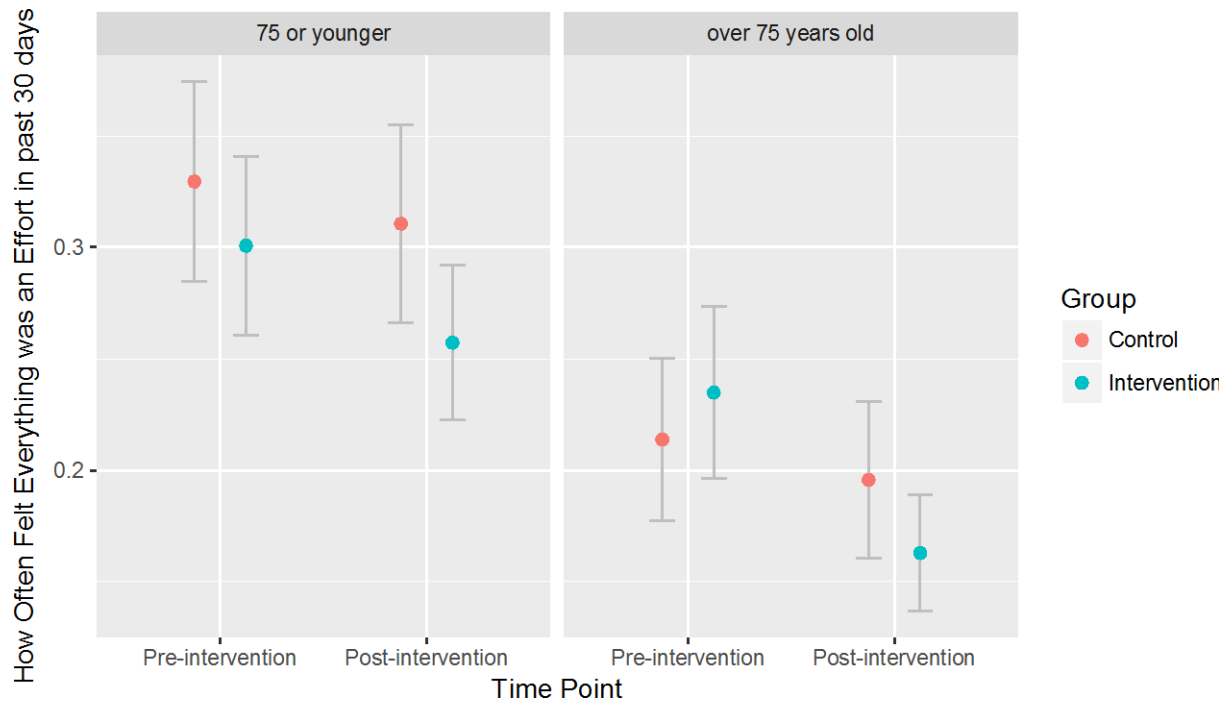


FIGURE 15: COMPARING FEELINGS OF FATIGUE PRE VS. POST INTERVENTION

As shown in Figure 15, a similar pattern emerged on the frequency of feeling that everything was an effort, a strong proxy of depression and poor physical and emotional health. Although the trends are consistent, the effect size only reached marginal statistical significance, 2-way Time x Group Interaction  $F = 3.44, p < 0.10$ .

Other intervention effects emerged on only one age group and not both. For example, in feelings of anger, intervention subjects over 75 felt angry less often after participation in the music sessions, but the same effect did not emerge among intervention subjects 75 or younger. Figure 16 illustrates this 3 way interaction between Time x Group x Age,  $F = 5.36, p < 0.05$ .

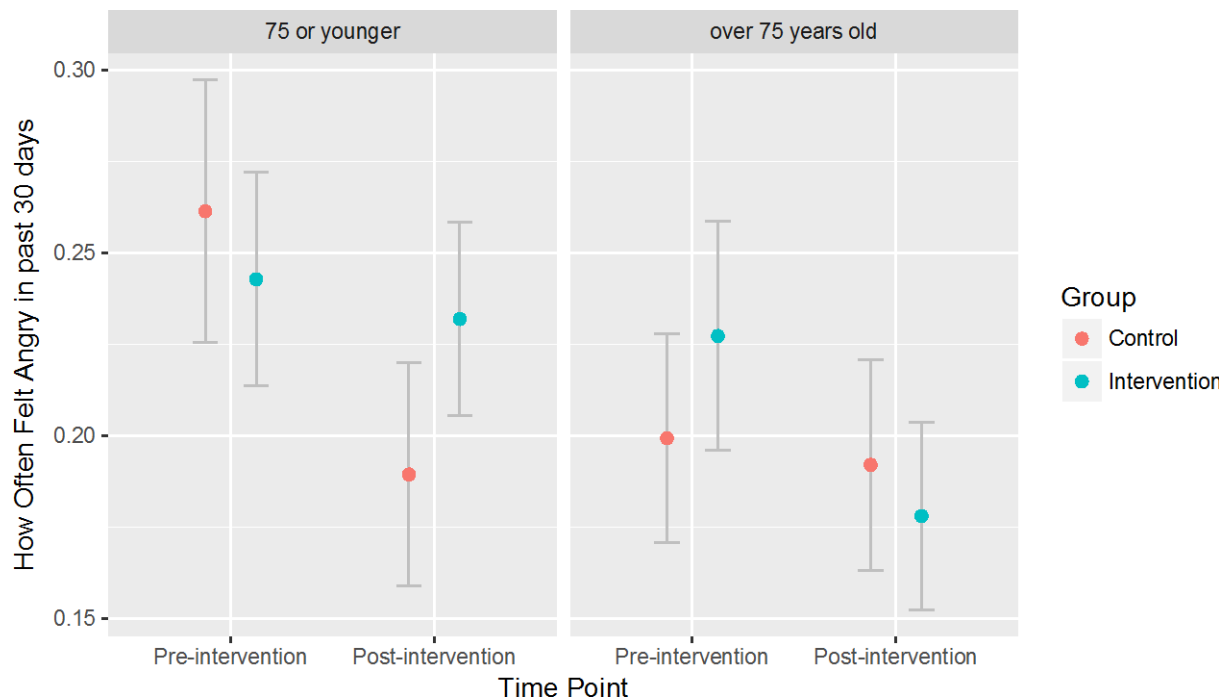


FIGURE 16: COMPARING FEELINGS OF ANGER PRE VS. POST INTERVENTION

A similar pattern emerged on feelings of anxiety. Intervention subjects over 75 felt nervous less often after participation in the music sessions, but the same effect did not emerge among intervention subjects 75 or younger. Figure 17 illustrates this 3 way interaction between Time x Group x Age,  $F = 3.76, p < 0.06$ .

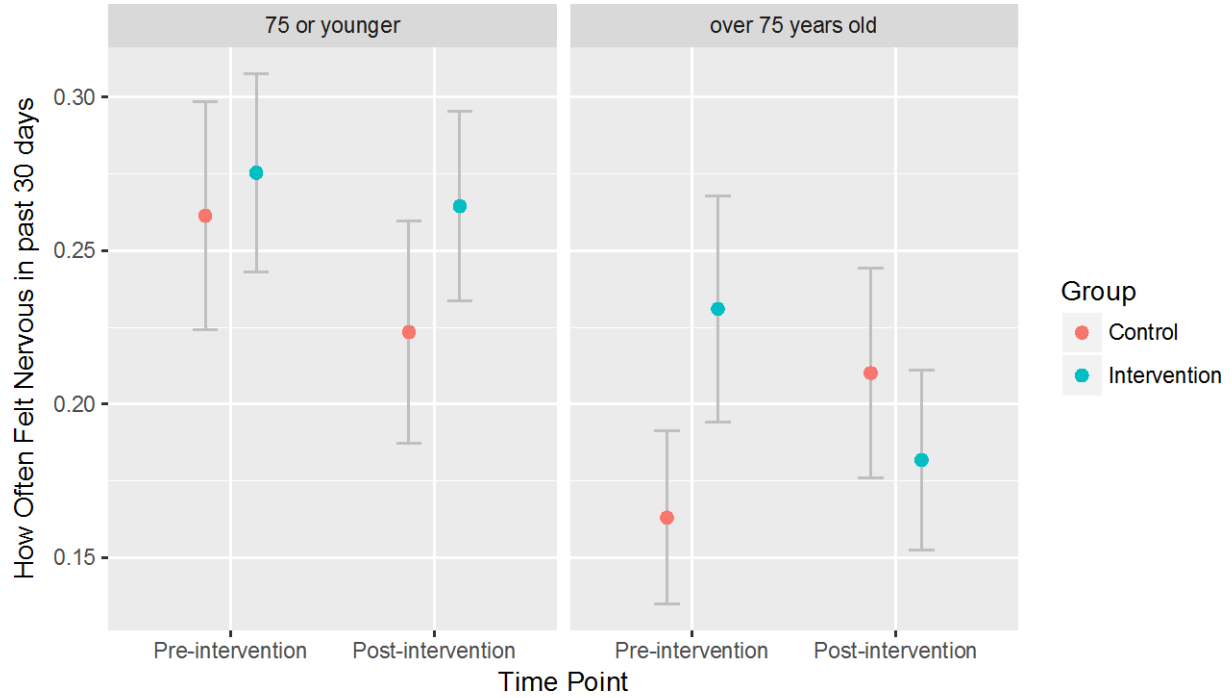


FIGURE 17: COMPARING FEELINGS OF ANXIETY PRE VS. POST INTERVENTION

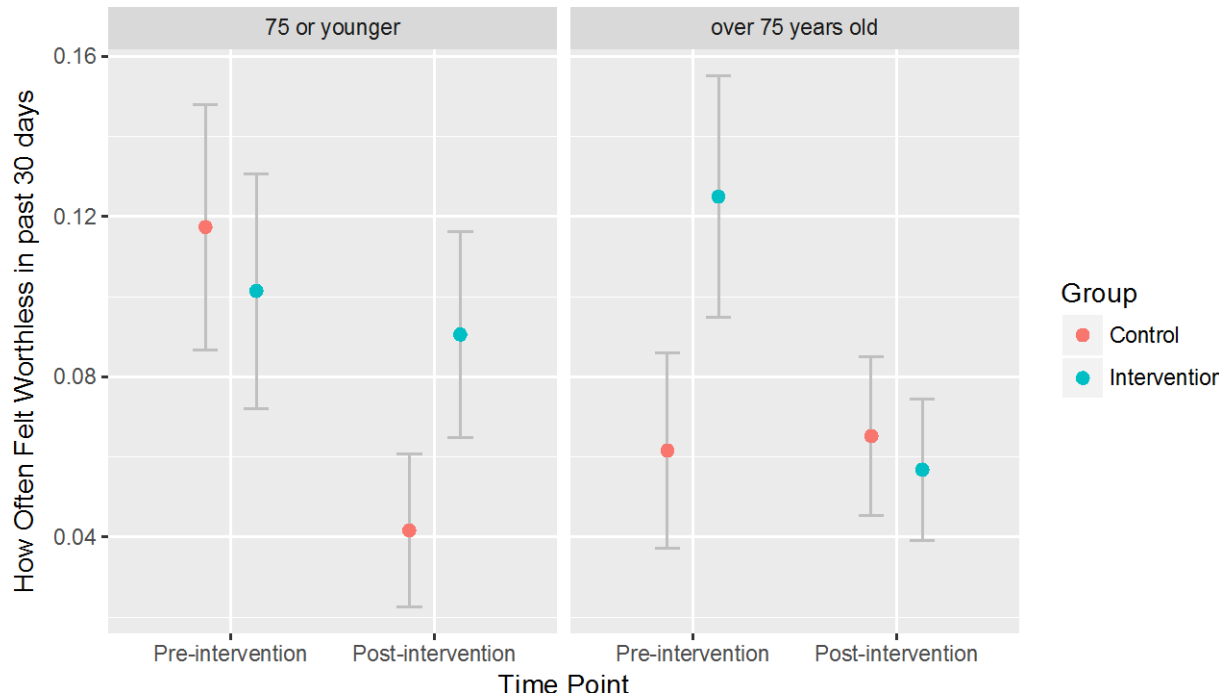


FIGURE 18: COMPARING FEELINGS OF WORTHLESSNESS PRE VS. POST INTERVENTION



A similar pattern emerged on feelings of worthlessness. Intervention subjects over 75 felt worthless less often after participation in the music sessions, but the same effect did not emerge among intervention subjects 75 or younger. Figure 18 illustrates this 3 way interaction between Time x Group x Age,  $F = 6.88, p < 0.01$ . Taken together, it is evident that music participants over 75 years of age reaped much more emotional benefit from the music sessions than their younger counterparts.

Data was also collected on other measures of emotional well-being, including sense of purpose in life, internalization of the social stigma of aging, feelings of joy, hope, self-efficacy and mastery. No significant intervention effect was detected on any of those measures, all  $p > 0.30$ .

In adherence to the AWVIA model of vital involvement in advanced years of life, residents were asked the extent to which particular core values are important to them, such as creative self-expression, connection with others / helping, personal growth, tradition, justice, honesty, responsibility, achievement / status, and simply experiencing life's sweetness. These measures were also taken at both pre-intervention and post-intervention time points, in order to assess how participation in the music sessions may have influenced what residents value in their lives. Across both age groups, analysis revealed that intervention subjects valued personal growth and learning (Figure 19) as well as simply experiencing life's sweetness (Figure 20) more at post-intervention time point than they did at pre-intervention time point, and certainly more so than the control subjects at both time points, 2 way Time x Group  $F = 4.65, p < 0.05$  for value placed on personal growth and learning; and 2 way Time x Group  $F = 3.04, p < 0.10$  for value placed on experiencing life's sweetness. Elements of this particular arts activity related to experiencing life's sweetness include reminiscing and discussing pleasurable experiences from

earlier life, sharing other residents’ reminiscences, pride in creativity, joy at reclaiming earlier musical skills and memories, and mastery at hearing and performing songs participants have created themselves.

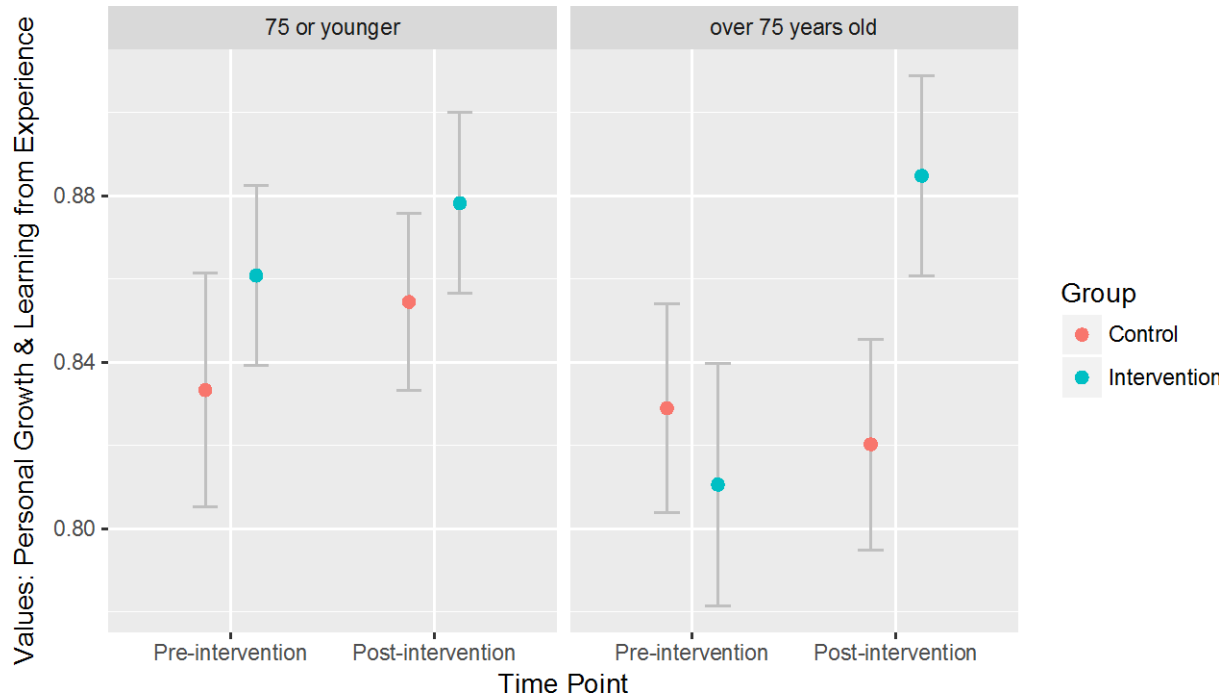


FIGURE 19: COMPARING VALUE PLACED ON PERSONAL GROWTH PRE VS. POST INTERVENTION

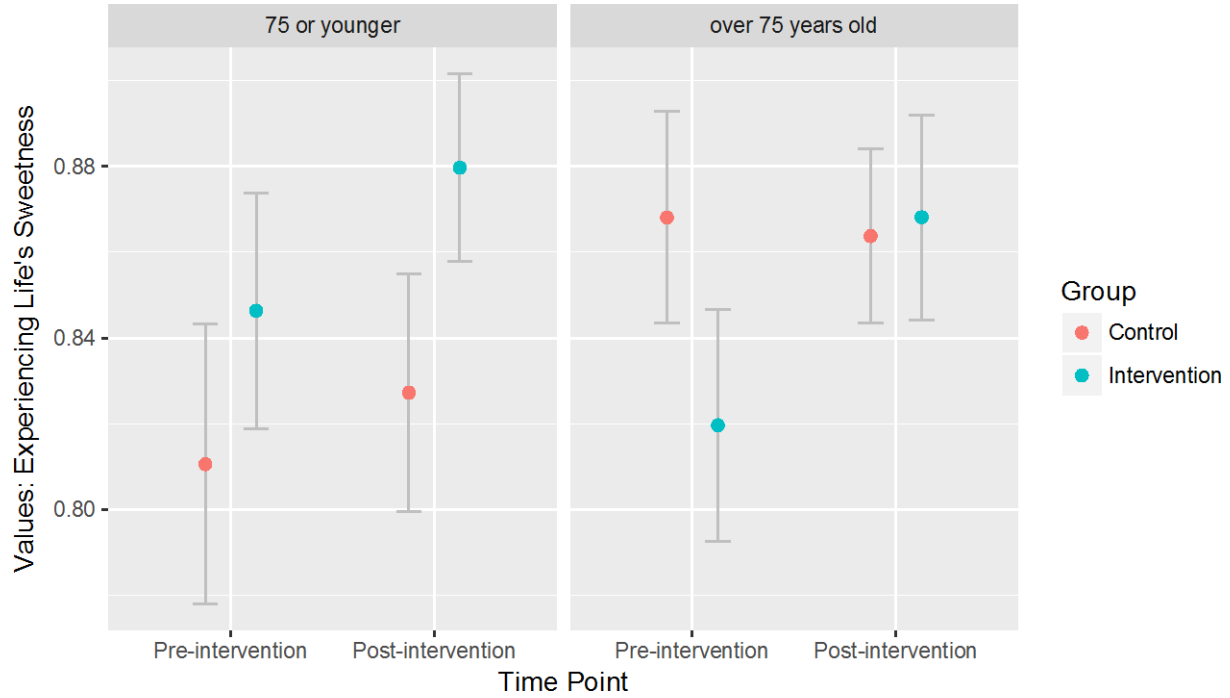


FIGURE 20: COMPARING VALUE PLACED ON LIFE'S SWEETNESS PRE VS. POST INTERVENTION

Other patterns emerged only among subjects 75 or older. As shown in Figure 21, intervention subjects 75 or older valued connections with others and helping others more at post-intervention than at pre-intervention; but this effect was not apparent among subjects younger than 75, 3 way Time x Group x Age Interaction  $F = 3.39, p < 0.10$ .

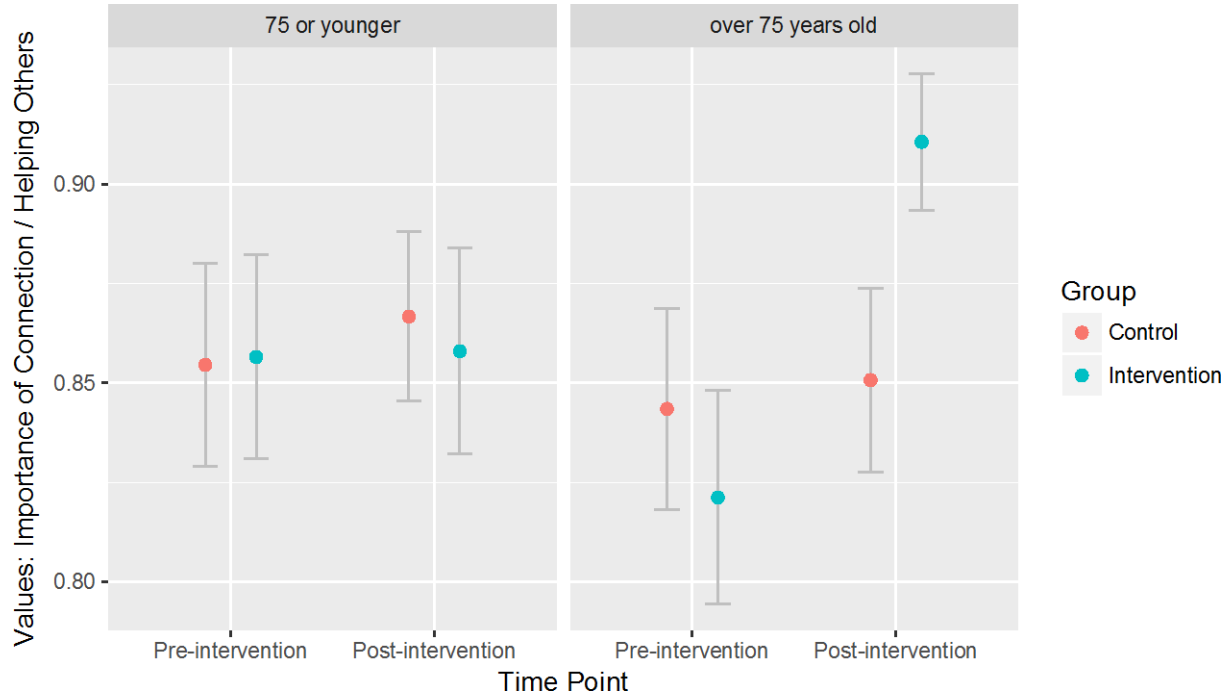


FIGURE 21: COMPARING VALUE PLACED ON CONNECTING & HELPING OTHERS PRE VS. POST INTERVENTION

A similar pattern was found on how much residents value creative self-expression. As shown in Figure 22, intervention subjects 75 or older valued creative self-expression more at post-intervention than at pre-intervention; but this effect was not apparent among subjects younger than 75, 3 way Time x Group x Age Interaction  $F = 10.01, p < 0.001$ .

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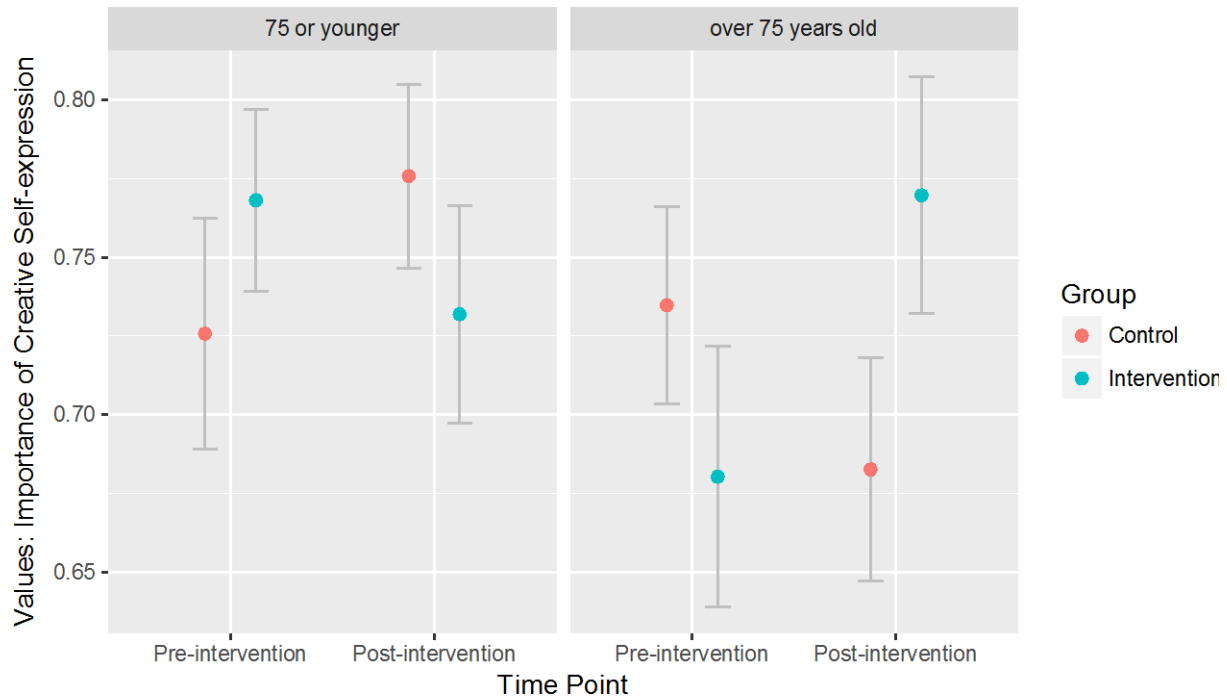


FIGURE 22: COMPARING VALUE PLACED ON CREATIVE SELF-EXPRESSION PRE VS. POST INTERVENTION

No significant effect emerged on other values, implying that the intervention did not affect the extent to which participants value tradition, justice, honesty, responsibility, or achievement and status, all  $p > 0.50$ .

**Site-wide Benefits**

Happiness and goodwill can be contagious. When our neighbors are in better physical and emotional health, and place more importance on values such as experiencing life’s sweetness, creative self-expression, and connecting with and helping others; the general sense of community around them could improve as well. Thus we explored the possibility that even the non-participants in the intervention sites may have experienced changes in their sense of community between the pre-intervention vs. post-intervention time points. Indeed, as shown in

Figure 23, more residents living in intervention sites reported better sense of community in May 2018 compared to January 2018, regardless of whether they had attended the music sessions,  $\chi^2 = 43.8, p < 0.001$ . Even though the music participants reported the most improvement in community engagement, some of their neighbors (i.e. the non-participants living in intervention sites) experienced some marginal improvement too.

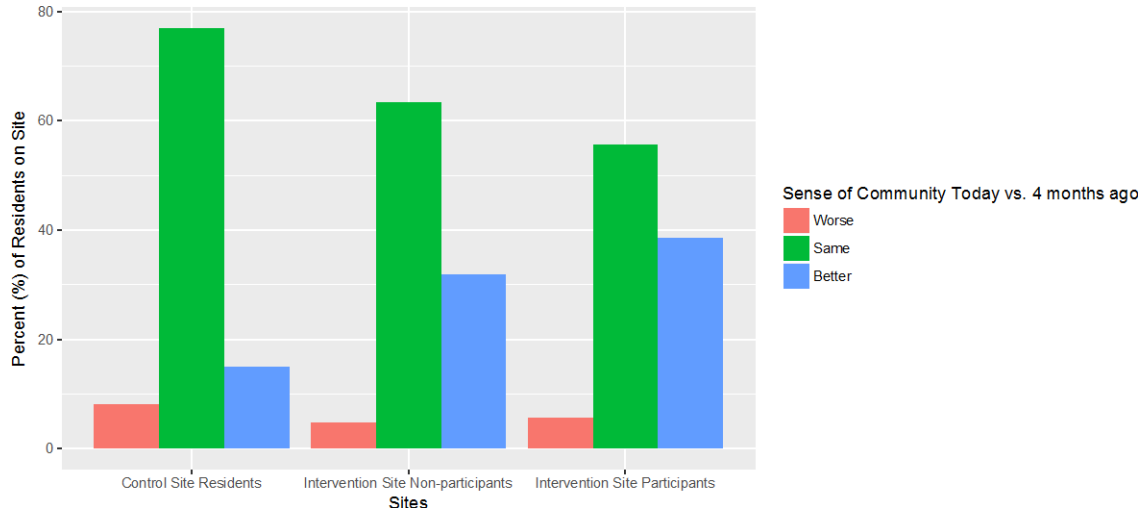


FIGURE 23: PERCEIVED CHANGE IN COMMUNITY ENGAGEMENT FOR NON-PARTICIPANTS

### Aging in Place Comparisons

Finally, analysis of data from both intervention and control sites on which residents departed from the housing site, and the reason for departure 3 months after the end of the music engagement sessions were performed to assess the relative odds of aging in place between the intervention and control sites. There was no significant difference between the intervention sites and the control sites on the odds of residents moving to facility that could provide a higher level of care ( $X^2 = 0.13, p > 0.70$ ); nor the odds of residents needing temporary hospitalization or rehabilitation facilities ( $X^2 = 0.35, p > 0.50$ ). We posit that the period of intervention may have been too short to result in any significant impact on these long term measures.

## Discussion

Correlation cannot establish causation. Arts participants could just be healthier and better adjusted anyway, and the arts had no real impact on their well-being. Comparing music sessions participants vs. matched control subjects in this quasi-experimental design allows us to isolate and quantify effect of creative arts participation, because the matched control subjects reflect where intervention subjects could still be if they had not had the opportunity of engaging in regular music sessions. As shown in the previous section, pre vs. post intervention measures across the wide array of QoL measures that address the outcome categories identified as previously explored in the arts research literature dimensions revealed significant positive effects of participation in the music sessions, particularly on outcome QoL metrics that increase residents' chances of thriving in an independent living setting. We see this outcome of "thriving in an independent living setting" as fundamental to HUD's mission of delaying institutionalization as long as possible. With this overall finding, our research begins to address the call by Fraser et al. "...that studies be undertaken that consider health and QoL concepts and indicators that are more explicit and theoretically driven particularly in terms of their relationship with specific qualities of the various artistic endeavors" (p725).

The AWWIA model is grounded in the developmental principle of Vital Involvement (Kivnick & Wells, 2014), and, by definition, builds on the conviction that meaningful engagement in the creative arts (like meaningful engagement with diverse elements of the environment outside the self) promotes healthy psychosocial development at all stages of life. Thriving in an independent living setting is one indicator of the psychosocial health in later life that life-cycle researchers have long identified as a major developmental goal of the life stage of

Older Adulthood (Erikson et al.). Both the AWWIA model and the collection of QoL components support the Public Health Agency of Canada's (PHAC) 2012 assertion that "...health is a capacity or resource rather than a state, a definition which corresponds more to the notion of being able to pursue one's goals, to acquire skills and education, and to grow. This broader notion of health recognizes the range of social, economic and physical environmental factors that contribute to health." (p2).

Of particular interest, in terms of social QoL variables, are the results that showed significantly stronger sense of community engagement at intervention sites than at control sites after 3 months of music sessions. In these sites, music participants were significantly more likely to report that people in the community help each other out, there are people one could count on in the community, people in the community can be trusted, and that the community is close-knit. In short, intervention site residents showed significant uplifts in their perceptions of community trust and engagement, while control site residents showed no significant change in perceptions. In addition, in intervention sites, even non-participants experienced improvement after three months of the AWWIA intervention. The particular arts activity in this intervention - collaborative songwriting - by definition, involves creative collaboration. Such behaviors as suggesting topics, generating lines of lyric, group wordsmithing, and group critiquing of whole verses and melodic lines both promote and exercise the cooperation and the mutual encouragement that are essential to the senses of community trust and engagement that have been shown to contribute to key determinants of individual health (Cooley, 2003). Cooley cites Brice-Heath's emphasis on learning and preparation in children, as an important outcome of arts participation. We maintain the need to pay attention to the importance of these same processes in our older adults. As these elders become an increasingly large proportion of our population,



their engagement with community and society must be optimally reciprocal (older adults *contribute to* and *receive from* community, society, and culture) for reasons both ethical and economic.

The intervention, itself, took place in each building's community room, which remained open to non-participating residents as they passed by this communal space's open door. Passers-by frequently stopped by the door to listen, commented on the lovely sound or the air of fun, and either accepted or declined the teaching artist's invariable invitation for them to join the group. Although these passers-by did not choose to participate in the intervention, the presence of this particular intervention clearly attracted their interest. Finally, each intervention site ended the season with a building-wide party in which participants performed their newly created songs with instrumental accompaniment. In some sites, the teaching artist invited audience members to join participants in their chorus. All of these elements may be expected to contribute to building residents' sense of community trust and engagement. The fact that nonparticipants experienced improved sense of community from the intervention indicates that the presence of easily accessible, community-based arts activities can have positive, potentially wide-ranging QoL-related benefits for *all* community members, not only self-identified participants.

The following excerpts from stories provided by Service Coordinators illustrate multiple dimensions of community engagement and trust associated with residents' participation in this program.

*Resident A was very adamant about telling me she would not be attending the program because of certain [other] residents who might be attending....Two of her friends ... attended the first session without hesitation. That evening both friends told Resident A about the wonderful experiences they had that afternoon at the program, and that the teaching artist had told the residents attending "You are now entering a fail-safe zone."*

*Next, day Resident A came down to my office and told me she would be attending next week's session, after talking to her two friends. The following week Resident A attended; ... she returned for a second week in a row. She has made a choice to attend the program despite those residents who have mistreated and bullied her for years. The [AWVIA-Songwriting Works] program is bringing restoration, joy, hope, health, and community to Resident A's soul and others like her.*

*The residents that have attended ... have really enjoyed it. We have even gotten a few residents who normally don't participate in things to attend, and THEY say that they really enjoyed it too. There have been a few sessions where the residents have had a grumpy or bad attitude while at the class and they either left early or stayed and felt better once the class was over. I have shared with these residents that they get what they put into these sessions. If you participate and allow the music to cheer you up, you more than likely leave feeling better...*

*Resident D is a 67 year old woman who has been attending our program. As a part of the program, we provide refreshments. The Service Coordinators have worked to get volunteers to provide the snacks. Resident D offered to bring the snacks for a couple of the sessions. She provided homemade goodies to share with the other [participants]. She enjoys baking and cooking. This provides a service to the other residents and also helps out the Service Coordinators. Providing the snacks gives Resident D a sense of purpose; she won the gift card for participating in the pre-program assessments and turned around and used that to provide the refreshments for the music program. Resident D is a blessing to the community and her neighbors.*

On physical health, intervention subjects reported significantly better physical health than controls after the 3 months intervention period. This effect implies that regular engagement in this music-participation program resulted in a better sense of well-being. Elements of the program that are potentially related to this positive physical health outcome include the physical warmup exercises that began each session, and the opportunity for regular group sessions for

creative and collaborative self-expression. In a similar vein, results showed that intervention subjects were less likely to feel older, or to experience more severe pain over the three-month period, than control subjects - again suggesting that these regular music sessions might have played a preventive role that inoculated participants from declining health (and associated feelings of “being older”) that plagued their counterparts who had not seized this opportunity for group participation.

A strong intervention effect emerged on the measure of physical exercise - regardless of age, all intervention subjects reported engaging in more moderate exercise than control subjects. Most residents living in these communities have disproportionately sedentary lifestyles and may not leave their apartments often. The draw of weekly music sessions was one reason for them to walk outside, meet people, and partake in the breathing and singing exercises. This particular music activity emphasized deep breathing exercises, relaxation exercises, and gentle movement exercises. All of these are essential elements of singing, and are also central to physical health and exercise. Teaching artists and participating Service Coordinators also encouraged participants to engage in these exercises on their own, outside of music sessions. For example, in one session a resident was uncharacteristically subdued. Instead of sitting forward in a chair, she sat on a couch and leaned into the cushions. When asked, she said that she had felt tired and “down” all day, but she hadn’t wanted to miss the session. The teaching artist pointed out that the group’s breathing and gentle movement exercises can help wake a person up in the morning, and provide energy boosts during the day. These exercises are easy to do on your own, in your apartment. In addition, the very fact that music sessions required participants to leave their apartments, come to their building’s community room, move around the room as the session

required (e.g., help set up chairs; walk over to snacks table), and then return to their rooms increased their physical exercise.

Even though intervention subjects did not perceive their memory had changed any more than control subjects, the intervention subjects age 75 or younger showed marginal improvement in their word recall on an objective test. Because the music sessions required participants to remember words in songs, it is possible that regular practice at remembering words in a relaxed setting may have aided memory improvement, albeit in a very small way, among the younger subjects. Regardless of age, this particular music activity involved participants in actual thinking about, talking about, creating, and verbalizing lyrics. Participants actively discussed the choices of particular words over others – both in terms of meaning, and also in terms of rhyme, word sound, and repetition. All of these elements of language are related to word recall. Also, because each group worked on creating and refining their songs over several sessions, this arts activity engaged multiple elements of memory. It may be that older participants regularly engage in critical, reflective, creative verbal activity less frequently than their younger counterparts and therefore experienced greater improvement in related outcome measures.

Emotional well-being measures also indicated positive effects; intervention subjects felt hopeless less often than control subjects at post-intervention, and they were less likely to feel that everything was an effort. Intervention subjects aged over 75 also felt angry, worthless, and nervous less often compared to their control subjects at post-intervention. These positive effects were not observed among subjects 75 or younger though. We can find no obvious theory that might explain this age difference; but we do see that subjects 75 or younger consistently reported less hopelessness and fatigue than older subjects so one might argue there was less room for improvement among this younger group than their older counterparts.

Participating in the music sessions also seemed to shift subjects' values in life. Regardless of age, intervention subjects valued personal growth and learning, as well as simply experiencing life's sweetness, more at post-intervention than at pre-intervention, and certainly more so than the control subjects at both time points. This effect parallels those for hopelessness and depression mentioned above. It also maps onto Vital Involvement's emphasis on the importance of personal growth and learning, and to PHAC's identified connection between health and personal growth and learning. This arts activity involved participants in learning new skills (e.g., songwriting; deep breathing accompanied by guided imagery; musical terminology) which could have contributed to their increasing valuation of learning and growth. If one had a deeper appreciation of personal growth and learning, or simply experiencing life's sweetness, then one would be less likely to feel hopeless and depressed.

Again, some effects on personal values emerged only among the older intervention subjects, whereby only intervention subjects age over 75 reported more importance placed on values such as connecting with others or helping others, and creative self-expression. These changes were not observed among subjects 75 or younger though. Anecdotal evidence from Service Coordinators who work closely with residents suggest that the subjects 75 or younger tend to have a lot more going on in their lives, whereas the subjects older than 75 tend to be a lot more homebound and had a bigger void in their daily lives. These more isolated and sedentary subjects may well have more time and energy to devote to values of personal creativity (readily pursued on one's own) and sharing contact and assistance within the building, than do the younger, more active subjects. They may also have benefited more from having a regular activity that was easily accessible to them on site. It also makes sense that younger residents' likely greater engagement with activities and people of accustomed life gives their short term

involvement in this (or any specific additional) activity proportionally less effect on their overall values than the same activity would, for older residents whose lives are relatively emptier.

The following story, submitted by a Service Coordinator in one of the intervention sites, illustrates specific participant experiences that we may associate with “experiencing life’s sweetness”:

*Resident B is a gentleman who had been a musician; he plays electric guitar and has recorded jazz albums. Resident B is often negative about everything in his life, including his music, since he did not get the record deal or recognition that he felt he deserved. We started the AWWIA – Songwriting Works study at the property, but Resident B did not participate.*

*Resident C had been attending the program. She had played drums in school, and she quickly jumped at the chance to play percussion instruments in the program. Resident C and the Service Coordinator both talked with Resident B and encouraged him to come and check out the program. Resident B finally came to a session this month. Resident D brought her guitar to this session for Resident B to play. (Resident B had not played his guitar for 6 years and in fact had sent it home with his son.)*

*Resident B was encouraged by everyone at the session, and he agreed that he would try to pick up his guitar again to play with the group at the music program celebration. He called his son and had him bring the guitar back to him and he has begun practicing, trying to build up his callouses again to be able to play at the celebration.*

*The teaching artist who leads the sessions is on the board of a jazz radio station in Bloomington, and was going to be doing an interview on the air. She talked with Resident B, took a copy of his CD to the station with her, and got a little bit of it played on the air. This thrilled Resident B. This Vital Involvement enabled him to see that other people did appreciate his music, gave him something positive to hold onto, and helped him reclaim an earlier-life source of identity and pleasure.*

As with age differences discussed earlier, it may be that younger residents enjoy many sources of experienced sweetness in their current lives, whereas, like the gentleman featured in the story above, older residents have lost many such sources and are therefore powerfully

influenced by new sources such as those that may have been introduced in this intervention. For the gentleman described above, the absence of vital involvement in his current life also left him free to ruminate – with anger and resentment – about perceived slights and victimizations from earlier life. For him, the various musical, mastery, reclaimed identity, and interpersonal joys of his musical experience with AWWIA are all the more powerful, in contrast to his life immediately before this experience.

On the other hand, one limitation of this study was that 1 in 4 participants attended the music sessions only once and never came back. We did a lot of debriefing to understand the barriers that prevented them from returning, and discovered the following common reasons: some residents were monolingual (Chinese / Vietnamese) and could not follow the sessions that were held primarily in English with at best only Spanish translations; the warm-up exercises at the start of each session were too long or too difficult for some residents; some residents were simply not into the particular style of music or musician (“not my type of music”); some residents had schedule conflicts with medical appointments or other commitments; and that some residents became bored and disinterested and lost momentum when the sessions seemed repetitive. All the above feedback could be relevant for future implementation of creative arts programming in HUD communities, and beyond. In addition, the fact that non-participants regularly observed intervention sessions from outside the activity suggests that even among non-participating residents, interest in aspects of this setting (e.g., music; arts; creative; group; collaborative; fun) exists to be tapped if interventions can be structured to overcome personal reticence, as well as the kinds of obstacles identified above.

The intervention reported in this manuscript is contextualized in a community-based, independent-living setting for low-income older adults. Although many residents have serious

health conditions and indicate early-stage memory impairment and dementia, with appropriate services and community supports, they are able to maintain residence in an “independent living” facility. Evidence from this research could be instrumental in influencing HUD funding allocations to include arts engagement programs shown to improve diverse dimensions of health, wellness, and QoL in low-income communities. Indeed, the study’s findings suggest that AWWIA’s model of pairing arts engagement with Vital Involvement can promote personal meaning, experience of life’s sweetness, and mutual community engagement, in the oldest and most vulnerable of low-income seniors. All of these are central to the healthy psychosocial development that is essential to “a good old age” (Kivnick & Pruchno, 2011, p 143).

Our findings certainly support NASAA’s assertions (2017) that the arts: 1) foster physical, mental and emotional health, aiding recovery processes and contributing to well-being; 2) create a welcoming sense of place and a desirable quality of life while also engaging citizens in meaningful discourse and encouraging collective problem solving; and 3) preserve culture and heritage, passing along the character and traditions of communities and cultures.

There was no significant difference (within three months of the intervention), between the intervention sites and the control sites on the odds of residents moving to a facility that could provide a higher level of care. Nonetheless, this study has demonstrated significant positive health and psychosocial benefits of participation in the creative arts, particularly on outcome metrics that increase residents’ chances of thriving in an independent living setting.

Clearly, a lot more convergent evidence is needed across a longer period of time and across different art forms, in order to make a strong case that creative arts programs can have significant health benefits. Repeated studies will also serve to differentiate between areas where creative arts engagement could improve wellness, and areas where they may not show much



impact. We are currently working on our next grant proposal to the NEA to replicate this study in other art modalities that can also be integrated with the AWWIA model. We anticipate that such research will provide additional information about the specific contributions of particular art modalities paired with Vital Involvement, to psychosocial health in very old age.

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