

Participatory Arts for Older Adults: A Review of Benefits and Challenges

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This article reviews the scientific literature on the enhancement of healthy aging in older adults through active participation in the arts. Methodologies and conclusions are described for studies of dance, expressive writing, music (singing and instrumental), theatre arts, and visual arts including documentation of mental/physical improvements in memory, creativity, problem solving, everyday competence, reaction time, balance/gait, and quality of life. In addition to these gains in measures of successful aging, the article also provides (in a [Supplementary Appendix](#)) some selected examples of arts engagement for remedial purposes. Finally, it offers suggestions for expanding inquiry into this underinvestigated corner of aging research.

Key Words: Arts, Quality of life, Cognition, Health benefits

Remedial use of the arts has a long history (e.g., [Hill, 1948](#)), but studies on enhancing healthy aging through arts participation are fairly recent. One advantage of the latter approach is its relatively low cost, generally using a single instructor and no expensive equipment. However, a search of the

literature revealed only 31 evidence-based studies on this promising field. First, a few definitions:

The term, “participatory arts,” concerns art making rather than art observing (e.g., dancing as opposed to watching dance performances.) We distinguish between two overall types:

1. *Wellness Studies* concern promotion of cognitive, emotional, physical, or psychological health in nondemented older adults capable of performing normal activities of daily living.
2. *Treatment Studies* fall within the following definition, “. . . the therapeutic use of art making . . . by people who experience illness, trauma or challenges in living ([American Art Therapy Association, 2012](#)).

Aims: The primary purpose of this review is to collect and describe current and past Wellness Studies (as defined above) and to promote future investigations with a strong evidentiary base. A secondary purpose is to indicate the extent and variety of Treatment Studies by presenting a sampling of the voluminous treatment literature (see [Supplementary Appendix](#)).

Methods

Inclusion and Exclusion Criteria for Wellness Studies

We included studies with nondemented older adults (>60 years) in good general health. In some studies (e.g., [Noice & Noice, 2009](#)), lack of dementia was determined by administration of the Mini-Mental State Examination (MMSE) or Pfeiffer's Short Portable Mental Status Questionnaire and general health by a demographic questionnaire. In other studies, we have accepted the authors' characterizations of their participants' generally good mental/physical health.

All experimental participants actively engaged in dance, expressive writing, music, theatre, or visual arts. Studies emphasized the aesthetic qualities of art; therefore, dance performed mainly for exercise (e.g., aerobic dancing or Zumba) was not eligible. Because participatory arts' wellness studies constitute a relatively unplowed field, this review attempts to cover all such evidence-based investigations regardless of execution date. However, we excluded case studies, small-n experiments, reports in nonpeer reviewed journals, and articles not written in English.

Search Criteria for Wellness Studies.—Data bases: PsycINFO, PubMed, SpringerLink, JSTORE Databases, Frontiers Journal Series, Science Direct, and SAGE Journals online. Keywords: aging, theatre, dance, music, painting, drawing, drama, visual arts, writing, and well-being, used in combinations such as aging and music. In additional searches, the term “older adults” replaced “aging.”

We expanded our search with sources such as Google and Google Scholar, and the “advanced access” feature of the *Gerontologist* to find suitable recently published papers. In addition, reference lists and citations of obtained articles were examined for further relevant sources, and on occasion, experts in the field were personally contacted. Titles and abstracts were examined to eliminate obvious mismatches with our stated aims, and then the complete texts of the remaining hits were read to determine final inclusion. All studies were examined independently by the first two authors; disagreements were resolved by discussion.

We also consulted two existing reviews ([Castora-Binkley, Noelker, Prohaska & Satariano, 2010](#); [Mental Health Foundation, 2011](#)) that presented a clear view (with much duplication)

of the limited and fragmentary state of *participatory arts/aging* research at time of their publication. The former review included only studies that their authors referred to as “therapeutic use of the arts” (very similar to our term, Wellness Studies) and excluded “arts therapies” (very similar to our term, Treatment Studies); the latter review included both types but did not label them as such. We included the few studies from those older reviews that fit within our wellness criteria. Locating studies for each of the five art forms required five searches.

The “Dance” search yielded 73 hits. We retained 11 for in-depth examination. (We also contacted one of the authors, resulting in two more papers for a total of 13 possibilities.) We rejected five as inappropriate, resulting in eight relevant dance studies.

For “Expressive Writing” studies, the databases led to 21 articles, none of which were suitable (most of them dealt with correct language usage, handwriting, or writing as treatment for existing disease.) Substituting autobiographical writing resulted in 26 hits of which two were relevant, and substituting Written Life Review added one more for a total of three.

The “Music” search provided 208 hits, which narrowed to 20 articles for further examination. From these, we found 9 relevant studies. Changing the search term “music” to “piano,” resulted in one other relevant study for a total of 10.

The “Theatre” search produced no usable results but “acting” produced 80 hits. Unfortunately, all but four studies dealt with acting-out behavior or short- or long-acting pharmaceuticals. Two more relevant studies were obtained from the previously mentioned review papers. Perusing of their references yielded one more, for a total of seven relevant studies.

In our “Visual Arts” search, nine articles appeared potentially relevant but none met all our criteria. “Painting” produced 137 studies, but only one study was a usable one (most of them dealt with art appreciation/viewing or museum visits). A colleague supplied another study, and Google Scholar led us to still another one for a total of three pertinent papers.

Note: To avoid redundancy, textual descriptions refer simply to *standard instruments*; exact names of those instruments along with participants' ages appear in [Table 1](#). Nonstandard experimenter-devised questionnaires, surveys, and conclusions are described in the text itself.

Table 1. Summary Results for the Reviewed Wellness Enhancement Studies

Author/year	Type of art	Design	Number of participants	Outcome Measures	Key Findings
Dance Coubard and colleagues (2011)	Dance (improvised contemporary dance)	Quasiexperiment (fall prevention and Tai Chi controls)	N = 110; age range: 64.9–83	Attentional control measured with arithmetic word problems, Stroop & Rule Shift Cards tests	Improved attentional control (task switching only)
Hui and colleagues (2009)	Dance	Quasiexperiment (dance vs. usual activities control group)	N = 111; age range: 60–75	Butland's 6-min walk test for exercise tolerance; (SF-36), EDI (dance benefits)	Improved resting heart rate, higher physical function scores, improvement in general health
Kattenstroth and colleagues (2010)	Dance (amateur ballroom dancing)	Quasiexperiment (experienced amateur dancers vs. nondancers)	N = 62; age range: 61–94	Raven's Standard Progressive Matrices, Multiple Choice Reaction Time test, Romberg's test, Timed Up and Go test, standing-turn test; Everyday Competence Questionnaire	Dancers showed better cognitive performance and physical health
Kattenstroth and colleagues (2011)	Dance (ballroom)	Quasiexperiment (competition-level dancers vs. education and age-matched nondancers)	N = 49; age range: 60–94	Everyday Competence Questionnaire; Raven's Standard Progressive Matrices; Reaction Time Measures; Up and Go test; Romberg's test, touch threshold, two-point discrimination threshold	Expert dancers had better posture and balance and faster reaction times
Kattenstroth et al. (2013)	Dance (Agilando™)	RCT, (dance vs. nondance controls)	N = 35; age range: 60–94	Many of the measures used in 2010 and 2011 studies plus spirometry to test cardiorespiratory performance	Improvement in posture, RT, cognitive, tactile and motor performance; well-being; no cardiorespiratory differences between groups
Kimura and Hozumi (2012)	Dance (lengthy choreographed sequences)	RCT; choreographed dance group vs. aerobic exercise group	N = 34; age range: 65–78	Task-switching reaction time test	For dance group, switch cost was smaller
Verghese and colleagues (2003)	Dance (social)	Longitudinal leisure activities study	N = 469; age range: 75–85)	Wechsler Adult Intelligence Scale, Blessed Information-Memory Concentration test, Fuld Object-Memory Evaluation, Zung depression scale, questionnaires	Social dancing was only the physically effortful leisure activity associated with lower risk of dementia

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Table 1. (Continued)

Author/year	Type of art	Design	Number of participants	Outcome Measures	Key Findings
Verghese and colleagues (2006)	Dance (social)	Cross-sectional survey (recruited from 2003 subject pool)	N = 24; age > 70 years	Blessed Information-Memory Concentration test, Free and Cued Selective Reminding Test, Wechsler Adult Intelligence Scale, Verbal fluency test, Trail Making Test, GDS Physical Performance Battery	Social dancers showed greater balance and gait compared with nondancers but not greater strength. No significant cognitive differences between groups
Expressive Writing Chippendale and Bear-Lehman (2012)	Writing (life review)	RCT (experimental group and waitlist control)—Pretests and Post-tests	N = 45; age range: 66–98	Geriatric Depression Scale (Geriatric Depression Scale); Duke Social Support Index; Social Support Appraisals Scale	Decrease in GDS scores for experimental group
De Medeiros and colleagues (2007)	Writing	Pretest and post-test, no control group	N = 18; age range: 62–84	Cognitive battery: list learning; Symbol digit Modalities Test; RAVLT; two writing samples evaluated for linguistic complexity	Improved on processing speed, attention, and verbal learning but no pre–post changes in linguistic complexity
De Medeiros and colleagues (2011)	Writing	RCT (autobiographical writing group. vs. no-treatment control group—pretest and two post-tests)	N = 51; age range: 67–96	Autobiographical memory (AM); Remote Memory Word Associations task; Hopkins Verbal Learning Test-Revised; Brief Visuospatial Memory Test-R; SF-36; NEO Five-Factor Inventory	AM did not improve on either immediate or delayed post-test, but both groups reported improved self-concept over time
Music Bugos and colleagues (2007)	Music (piano playing)	RCT (individualized piano instruction and untreated control). Pretest and two post-tests	N = 31; age range: 60–85	Modified version of Wechsler Adult Intelligence Scale III, Trail Making test	Significant improvement on digit symbol and Trail Making test. Effects no longer present (after no practice) at 3-month delay
Cohen and colleagues (2006)	Music (choral group)	Quasiexperiment; (pre–posttest)	N = 166; age range: 65–100	EDI plus Lawton's Morale scale, Russell's Loneliness Scale, Sheikh and Yesavage's Depression scale	Improved self-reported health, smaller increase in doctor visits and medications, fewer falls. Less loneliness.
Cohen and colleagues (2007)	Music (choral group)	Quasiexperiment (intervention and control group)	N = 128 due to attrition; mean age = 79	Same as those used in the 2006 study	Improved self-reported health, fewer doctor visits. The singing group also experienced better morale and less loneliness

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Table 1. (Continued)

Author/year	Type of art	Design	Number of participants	Outcome Measures	Key Findings
Clift and colleagues (2012)	Music (choirs)	Randomized controlled trial (pretest and two post-tests; singing group vs. control)	N = 265; age > 60	Quality of life (York SF-12); psychological well-being (Hospital Anxiety and Depression Scale)	Improved mental health at 3 months; reduced levels of depression and anxiety
Coffman (2008)	Music (musicians)	Survey study	N = 1,652; average age: 70	EDI incorporating SF-36	Self-reported emotional and physical well-being, cognitive stimulation, socialization benefits
Hanna-Pladdy and Mackay (2011)	Music (instrumental)	Quasiexperiment (high & low activity musicians, and nonmusicians)	N = 70 Age range: 60–83	Trails A and B; Boston naming test; visual reproduction, Visual Reproduction VRII; CVLT (short form)	Musicians had higher nonverbal memory recall, visuomotor speed and sequencing; greater cognitive flexibility
Hanna-Pladdy and Gajewski (2012)	Music (instrumental)	Quasiexperiment (musicians >10years experience) vs. nonmusicians)	N = 70; age range: 59–80	Same cognitive battery as above, except long form of California Verbal Learning Test	Musicians scored higher on verbal working memory, verbal memory, verbal fluency, visuospatial functions
Hillman (2002)	Music (choir)	Questionnaire survey (response range = 75%)	N = 79; age > 60	EDI (33-item questionnaire on perceived benefits of singing)	Perceived improvement in emotional and social well-being, quality of life
Koga and Tims (2001)	Music (organ players)	Quasiexperiment (organ players and no-treatment control group)	N = 100; age: > 65; age range: 62–95	Mental Health Inventory-FN4; Profile of Mood States	Lower levels of anxiety, decrease in perception of loneliness; increase in human growth hormone (hGH)
Solé and colleagues (2010)	Music (choir)	Pre-post quasiexperimental design (choir, music appreciation, music therapy)	N = 83; mean age: 72.6	Depression and Dejection-FN5; psychological health questionnaire; blood tests	No significant results. Some anecdotal self-reports of life satisfaction and optimism
Theatre Davis (1985)	Theatre	Exploratory study—quasiexperiment without control group	N = 15; age range: 64–87	Life satisfaction (Lawton); depression (Yesavage), self-esteem (Rosenberg). EDI	Downward trend on anxiety and one measure of hostility
Noice and colleagues (1999)	Theatre	Single-group before-after design (Pilot study)	N = 13; age range: 65–82	Gottschalk and Glaser (1969); hope, anxiety, human relations, and four aspects of hostility	Significantly higher recall and recognition scores at post-test

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Table 1. (Continued)

Author/year	Type of art	Design	Number of participants	Outcome Measures	Key Findings
Noice and colleagues (2004)	Theatre	RCT (theatre, visual art, waiting-list control—two post-tests)	N = 124; age range: 60–86	Word recall, memory span, problem solving; Self-esteem (Rosenberg), psychological well-being (Ryff, 1989)	Theatre group showed increase in word recall, problem solving, and psychological well-being
Noice and Noice (2009)	Theatre	RCT (theatre, singing, waiting-list control)	N = 122; age range: 69–93	Immediate and delayed word recall; verbal fluency; East Boston Memory Test; Means-Boston problem solving. Personal growth (Ryff, 1989), MCI (Lachman); Lifestyle Activities Questionnaire (Wilson)	Improvements in recall (immediate and delayed), verbal fluency, problem solving; personal growth
Noice and Noice (2013)	Theatre	RCT (theatre, waiting-list control) taught by activity directors and an outside acting teacher	N = 97; age range: 68–94	Similar to 2009 plus Observed Tasks of Daily Living-R (OTDL)	Theatre group improved on OTDL, problem solving, and verbal fluency demonstrating that successful administration did not depend on individual qualities of original instructor.
Pyman and Rugg (2006)	Theatre (music hall)	Semistructured interviews	N = 8; age > 60	Interviews to assess personal enrichment	Perceived improved confidence and self-esteem; enjoyed being creative
Yuen and colleagues (2011)	Theatre	Single-group design (pretest and post-test)	N = 12; age range: 62–88	Subjective well-being (General Well-Being Scale); SF-36; individual interview	Perceived improvement in psychological well-being and physical health; enjoyment of social interaction
Visual Arts Greer and colleagues (2013)	Painting	Semistructured interviews; observation (over 14 months)	N = 11; age range: 66–79	Observation; EDI (Self-rated physical and mental health)	Self-perceived improvement in mental and psychosocial health; sense of calm and relaxation
Kim (2013)	Painting and clay art	RCT (art therapy and control group) pretest and post-test	N = 50; age: 69–87	State-trait Anxiety Inventory; Positive and Negative Affect Schedule, and Rosenberg's Self-Esteem Scale	Reduced negative emotions and anxiety; improved self-esteem
Reynolds (2010)	Painting, pottery, or textile art	Semistructured interviews	N = 32; age range: 60–86	EDI (interviews to assess motivation for creating art, and benefits derived)	Perceived their lives as more meaningful, derived enjoyment, and satisfaction from art

Note: The designation EDI under Outcome Measures indicates that an experimenter-devised instrument was used in addition to, or instead of, standard measures.

Review of Wellness Studies by Art Form

Dance

Five of the eight studies employed cognitive/affective measures along with physical ones. The remaining three studies used only cognitive/affective measures. (Studies using purely physical measures were considered dance-as-exercise and were not included; for a review of the latter, see [Keogh, Kilding, Pidgeon, Ashley, & Gillis, 2009](#)).

A frequently cited longitudinal study ([Verghese et al., 2003](#)) showed that the only type of physically effortful leisure activity that had a significant negative association with Alzheimer's disease was social dancing. However, when [Verghese and colleagues \(2006\)](#), using the same cross-sectional survey, compared two groups (social dancers and nondancers matched for age, gender, and education), they found equal cognitive performance for both groups (but better balance and gait for dancers).

Using a quasiexperimental design, [Kattenstroth, Kalisch, Kolankowska, and Dinse, \(2010\)](#) tested 62 experienced amateur ballroom dancers (16.5 years of weekly dancing) and 38 nondancers matched for gender, education, and age. The investigators found that the dancers demonstrated statistically significant higher performance on standard cognitive and physiological measures; they also scored higher on a questionnaire that evaluated general health, subjective well-being, and tasks of daily living.

These researchers performed a follow-up study ([Kattenstroth, Kalisch, Kolankowska, & Dinse, 2011](#)) comparing national competition dancers (>22 years of experience) with nondancers and found that competitive-level experts achieved higher scores than nondancers on a broad range of standard cognitive and physical measures, especially expertise-related areas such as reaction time, posture, and balance. However, when the researchers compared these results with those of the above 2010 study, they concluded that the intense training to reach the national competition level may not confer additional nonphysical benefits over weekly dancing for 16.5 years.

Some of the same researchers ([Kattenstroth, Kalisch, Holt, Tegenthoff, & Dinse, 2013](#)) used a randomized controlled trial (RCT) to determine causality. Two groups who had not participated in regular dance or sports activities for 5 years were randomly assigned to a 6-month dance course (1 hr/week under a professional instructor) or to a

usual activities condition. Pre–post testing revealed significantly higher performance (on many of the same measures used in the two previous studies) for the experimental group compared with controls. Furthermore, neither experimentals nor controls showed any increase in cardiorespiratory fitness (as measured by spiroergometry), suggesting that the frequently reported cognitive benefit from aerobic exercise (e.g., [Erickson & Kramer, 2009](#); [Stratton, Levy, Schwartz, Abrass, & Cerqueira, 1994](#)) was not the operative mechanism here.

[Kimura and Hozumi \(2012\)](#) compared a primarily exercise-based freestyle dance regime (FR) with a more cognitively complex choreographed performance of the same basic moves (CB), both taught by an experienced dance instructor. The researchers found significantly better performance on a standard reaction time task for the CB group and concluded that the choreographed dance facilitated attentional control, a component of executive function.

[Hui, Chui, and Woo \(2009\)](#) decided that a true RCT was impossible because their participants insisted on being in a study group with their friends. However, within each group, participants were randomly assigned to either a dance or a control (usual activities) condition. The dancers took two 50-min sessions per week for 12 weeks, consisting of choreographed movements devised by both a dance instructor and a physical therapist. Results of standard tests showed significant improvements for dancers compared with controls on physical measures. All experimental subjects then answered a researcher-devised questionnaire, revealing that 82.7% considered the lessons to be psychologically very helpful or extremely helpful (the top two categories) and 77% considered it to be physically very helpful or extremely helpful.

[Coubard, Duretz, Lefebvre, Lapalus, and Ferrufino \(2011\)](#) observed increased attentional control (but only for task switching) after 5–7 months among participants who improvised contemporary dance moves compared with demographically similar groups that engaged in Tai Chi lessons or a fall prevention program. However, assignment to condition was not random; it depended on the districts in which participants resided.

These dance studies, using both correlational and experimental approaches, present a fairly compelling picture for dancing as a vehicle for healthy aging, although none of the researchers compared the benefits of dance to those of other art forms.

Expressive/Autobiographical Writing

De Medeiros, Kennedy, Cole, Lindley, and O'Hara (2007) performed a quasiexperiment with retired physicians and their spouses who had enrolled in an 8-week autobiographical writing workshop that used different narrative forms: memoirs, letters, journals, poetry, and so on. Results showed significant pre-post improvement on standard measures of processing speed, attention, verbal learning, and memory. However, the lead researcher with new associates (De Medeiros, Mosby, Hanley, Pedraza, & Brandt, 2011) subsequently performed an autobiographical writing RCT, based on the same intervention, with the same instructor, and over the same time-frame, but with different outcome measures. This time the participants were nondemented older adult residents of continuing care facilities. The researchers found no advantages for the experimental group, reinforcing the importance of randomization and suggesting that original interest in writing and/or a high level of education were necessary for the beneficial effects or that the new outcome measures failed to capture improvement. Chippendale and Bear-Lehman (2012) conducted an 8-week (one session per week) RCT for 45 participants (23 experimentals, 22 controls) using a course in writing life reviews designed to combat depression or potential depression in older adults. We are including this study in the Wellness category because the overwhelming majority (18 of 23) of the experimental participants scored normal on a standard depression scale at pretest. (For controls, 13 of 22 were normal, 8 mildly depressed, and 1 severely depressed). Significant pre-post improvement on standard instruments for experimentals was found compared with controls, with those in the normal range increasing from 18 to 21, those rated as mildly depressed decreasing from 3 to 2, and those rated as very depressed decreasing from 2 to 0 (no significant changes in the control group). According to the authors, these results suggest the existence of preventative elements in this intervention.

Unlike other interventions in this review, the above writing courses were not taught by professional specialists but by the experimenters themselves, utilizing sources such as the Workbook On Writing Life Stories (Sierpina, 2002).

Music

Ten investigations produced a wide variety of results. In one landmark study, Cohen and

colleagues (2006) recruited 166 demographically similar older adults. Ninety older adults were invited to join a chorale under a professional leader (singing experience not required), and 76 continued with their usual activities. They were tested individually at baseline with both standard measures and a self-report questionnaire. After 12 months, the chorale group showed positive results on the standard measures. Also, the self-reports showed decreases on number of doctor visits, number of falls, and use of over-the-counter medications, and increases on overall health rating and number of activities performed. These participants were followed for an additional 12 months. Using the same outcome measures, the researchers found similar but somewhat less dramatic results (Cohen et al., 2007).

A limitation to the studies by Cohen and colleagues (2007) is the lack of randomization; only those who volunteered to join a chorale were included in the experimental group. However, Clift, Skingley, Coulton, and Rodriguez (2012) performed an RCT in which they randomly assigned 265 participants to either a chorale performance or a usual activities (control) condition. After 12 weeks, significant decreases were seen for singers on a standard depression/anxiety scale, as well as increases on a quality-of-life scale. Although these advantages were most pronounced immediately after post-testing, they persisted at 6 months.

Hillman (2002) devised a survey instrument to determine the thoughts and feelings of amateur members of a professionally led Scottish musical organization, Call That Singing? (CTS). The 33-item questionnaire (comparing behavior before and after joining CTS) was mailed to 100 older adult members. The return rate was 75%. Results revealed that 89% of respondents regularly attended the weekly rehearsals with more than half using public transportation of up to 90 min. Participants were asked to rate their physical health, emotional well-being, social life, self-confidence, understanding of singing, quality of life, and attendance at other cultural events. Statistically significant increases were found for improved emotional well-being, quality of life, understanding of singing, and a marginally significant increase in self-confidence. Seventy-one percent of respondents had been members of CTS for more than 7 years.

The above research involved singing; other investigators looked at instrumental music. Coffman (2008) performed a survey using standard scales and experimenter-devised questions for

older adult instrumentalist members of the New Horizons International Music Association. Return rate from the musical organizations (bands/orchestras) was 94%. Not all members of each band/orchestra filled out an individual survey, but 53% of the 3,094 members did answering questions such as “Do you believe that playing an instrument in a New Horizons group has affected your health either favorably or unfavorably?” Of the 1,626 answers to that question, 98% were characterized by Coffman (2008) as, “uniformly positive” (p. 383).

A multiyear experiment (Koga & Tims, 2001) examined an existing senior music program in Clearwater, FL. One-hundred participants (half taking organ lessons and half demographically similar nonmusicians) completed standard mental health inventories plus the researchers’ psychological assessment questionnaire every 10 weeks for 50 weeks. Each participant also gave a blood sample. Results showed decreased levels of anxiety and depression and a 90% increase in levels of human growth hormone (hGH). According to the researchers, an increase in hGH (which generally declines with age) is associated with higher energy, better memory, and greater sexual function. No other wellness studies were found that used hGH or any blood measure.

Hanna-Pladdy and MacKay (2011) compared three groups of older adults equated for age, education, and gender distribution (total: 70 participants). The key variable was years of training/playing a musical instrument (>10 years [high activity] vs. 1–9 years [low activity] vs. no training). All participants were tested on a standard comprehensive neuropsychological battery. The main finding was that the musicians with at least 10 years of experience scored significantly higher than the nonmusicians on all tests except verbal memory and that the cognitive performance of the low activity group was between the nonmusicians and the high-activity group, suggesting a possible linear relationship between amount of playing and cognitive performance. No significant pre–post differences were found for the age at which the participants had started training. The researchers suggested that the results were due to cognitive reserve built up during years of training/playing but supplied no specific evidence for this. Also, the researchers felt that musicians might be more prone to engage in cognitively enhancing activities in general, and therefore, they controlled for such general activities in a subsequent two-group study

(Hanna-Pladdy & Gajewski, 2012), again demonstrating superior performance for the musicians with more than 10 years of experience over nonmusicians on their standard test battery.

Solé, Mercadal-Brotons, Gallego, and Riera (2010) using a combination of standard assessment measures and their own original questionnaire compared one participatory and two nonparticipatory musical activities (choir: 52 participants, music appreciation class: 19 participants, music therapy: 12 participants.) The latter was described as “. . . work on and practice [of] functional skills at the physical, cognitive, and social-emotional levels through music” (270). All 83 participants were characterized as healthy. Pre–post results on the standard tests showed no advantages for any of the groups. However, some individual questionnaire responses indicated perceived enhanced social relations and personal development.

Bugos, Perlstein, McCrae, Brophy, and Bedenbaugh (2007) examined working memory and executive function in older adults in an RCT utilizing individualized piano instruction. Sixteen participants were randomly assigned to 6 months of weekly half-hour private piano lessons with a requirement to practice the learned material for 3 hr per week; 15 untreated participants comprised the control group. Individual pre–post testing consisted of two standard cognitive tests. The experimental group performed significantly better on both. According to the authors, these results suggest that individualized piano instruction enhanced cognitive processes, such as attention, concentration, and planning. Delayed testing at 3 months (without intermediate practicing) indicated that the gains were not maintained.

Although not all studies produced significant results, the more rigorous ones presented strong objective evidence for the effectiveness of musical participation.

Theatre

In a 25-year series of inquiries, a research team investigated the cognitive processes of professional actors. For many years, the work was purely theoretical (e.g., Noice & Noice, 2001) but eventually took an applied turn, attempting to enhance cognitive functioning and decrease risk factors for dementia in mentally healthy older adults. A series of studies using RCTs and other paradigms repeatedly produced evidence that significant increases in memory, comprehension, creativity, and

problem-solving ability can be produced in adults by a 4-week (eight-session) course in acting, taught by a professional actor/educator, cumulating in full performances of scenes from memory (e.g., Noice & Noice, 2009, 2013; Noice, Noice, Perrig-Chiello & Perrig, 1999; Noice, Noice & Staines, 2004). For example, in a study comparing acting, singing, and waiting-list controls (Noice & Noice, 2009), significant pre–post increases were found for the acting group in word recall, immediate and delayed story recall, problem solving, and verbal fluency. Each study in the series employed a different type of control group to rule out contributions from noncontent specific effects, motivational factors, use of one particular expert instructor, and activation experienced during public performance. In addition to the cognitive gains, significant increases were observed on a personal growth scale and on the observed tasks of daily living.

The same theatre training program is now being tested using neuroimaging in a 3 Tesla MRI system (see <http://bic.beckman.illinois.edu/resources.html>). Given previous studies that have found cognitive and brain benefits of interventions with older adults ranging from physical activity/exercise training to cognitive training (e.g., Chaddock, Voss, & Kramer 2012; Hertzog, Kramer, Wilson & Lindenberger, 2009), the researchers predict increases in volume in brain regions that support memory and executive control, increases in connectivity in brain regions that support the variety of cognitive processes engaged by theatre training and improvements in the performance of tasks that tap relational memory, as well as attentional and executive controls.

Our literature search yielded three other articles on healthy aging through theatre activities. Davis (1985) eschewed performance from memory and concentrated on improvisational drama. She recruited 15 older adults from a local senior center; they participated in a total of 17 sessions (three per week for 6 weeks) administered by two theatre graduate students. Once a week, the participants individually produced verbal protocols that were subjected to content analysis using a standard scale for measuring immediate effect. She found positive changes in anxiety and in one measure of hostility. No control group was used, so significance could not be assessed.

Pyman and Rugg (2006) performed a qualitative study with a convenience sample of eight community theatre members (five performers and three production personnel). They had participated in an amateur old-time British Music Hall Show and agreed to semistructured interviews. The interviews

were computer analyzed, revealing an increased sense of self-enrichment, self-esteem, enhanced learning ability, new friendships, and enjoyment.

Yuen, Mueller, Mayor, and Azuero (2011) recruited 12 participants from low-income senior housing, who had signed up for free acting lessons from a local theatre company (six weekly 2-hr classes). The classes consisted of short dance warm-ups, followed by a wide variety of improvisations and theatre games, and ended with group singing. At no time did the participants engage in performance of written scenes from memory. Results showed a significant pre–post increase on a well-being scale and on the physical but not the mental items of a standard health survey.

All but one of these investigations involved participatory acting classes, producing converging evidence of cognitive/affective benefits, documented by standard assessment instruments. As a result, these theatre studies present a fairly cohesive picture compared with those of other art forms.

Visual Arts

Greer, Fleuriet, and Cantu (2013), using observation, surveys, self-reports and semistructured interviews, tested residents of a housing complex for fixed-income older adults who received free on-site painting lessons from a professional artist/teacher. Results indicated increased social engagement, sense of empowerment, and psychological health. No time requirements were imposed; participants attended as many sessions as health, desire, and conflicting engagements permitted.

Reynolds (2010) performed a qualitative study of 32 retired women who discussed their new-found interest in visual art, defined as painting, pottery, or textile art (weaving, quilting, embroidery for aesthetic, not practical purposes). Phenomenological analysis of the interviews (based on guidelines by Smith & Osborn, 2003) indicated that art engagement enriched participants' mental lives, set new challenges, developed new skills, encouraged greater attention to nature, and preserved their identities. A recurrent theme was the sensuality of working with colors and textures.

Using a waiting-list design, Kim (2013) performed an RCT with 50 nondemented Korean-American older adults who had scored 26–30 on the MMSE. The experimental group participated in visual art sessions three times a week for 4 weeks. The sessions included a 10- to 15-min phase called “unfreezing” (no further explanation given), 30–40 min of art

making with materials of their choice (acrylic paints, drawing pencils, modeling clay, etc.), followed by group discussion, for a total time of 60–75 min. The experimental group scored significantly better on standard outcome measures for anxiety, affect, and self-esteem. (As stated in the introduction, participants' ages and the specific outcome measures for all reviewed studies are shown in Table 1).

Discussion

An examination of the 31 reviewed studies reveals overwhelmingly positive cognitive/affective/quality-of-life outcomes for various participatory art forms. Only three research teams performed multiple-linked studies; all others produced one each. Some of the authors (e.g., Bugos et al., 2007; Hanna-Pladdy & MacKay, 2011; Noice & Noice, 2009) speculated on underlying mechanisms but most did not. However, almost all cognitive improvements seen here would be consistent with current theories of brain plasticity and cognitive reserve. (For a discussion of how plasticity and reserve are implicated in arts engagement, see Vance & Crowe, 2006). Unlike the cognitive results, no underlying theoretical threads appear to connect the interesting but disparate psychosocial findings.

Obvious advantages of arts participation include its intrinsically pleasurable and self-motivating nature (e.g., Gutman & Schindler, 2007; Kraus & Anderson, 2013; Stacy, Brittain & Kerr, 2002), the social support inherent in group arts instruction (e.g., Cacioppo & Hawkley, 2003; Seeman, Lusignolo, Albert, & Berkman, 2001), the multi-model nature of participation (e.g., Johnson et al., 2013), and the well-researched benefits of stimulating or productive activities (e.g., Glass, de Leon, Marottoli, & Berkman, 1999; Hultsch, Hertzog, Small & Dixon, 1999; Wilson & Bennett, 2003).

Uninvestigated arts activities that might supply additional evidence of benefits include fiction writing, sketching, interpretive dancing, and photography, assuming that such programs were led by professionals who hold students to reasonable standards of accomplishment. This review reveals dismayingly small total number of investigations and not all were well controlled. The only pre–post studies with random assignment to condition were as follows:

Dance: Three studies (Hui et al., 2009; Kattenstroth et al., 2013; Kimura & Hozumi, 2012)

Expressive/autobiographical writing: Two studies (Chippendale & Bear-Lehman, 2012; De Medeiros et al., 2011)

Music: Two Studies (Bugos et al., 2007; Clift et al., 2012)

Theatre: Three multiveneue studies by the same investigative team (Noice & Noice, 2009, 2013; Noice et al., 2004)

Visual arts: One study (Kim, 2013)

Outcome measures in the reviewed studies varied from well-known instruments that allow replication to original surveys/questionnaires designed to answer individual research interests. To increase consistency, we suggest the following:

1. Standardized measures, common vocabulary, and comparable behavioral outcomes so that effectiveness across interventions can be assessed. Outcome measures in the wellness literature review ranged from memory-assessment instruments (e.g., East Boston Memory Test) to psychiatric inventory (e.g., FN-4), with no two investigative teams employing the same instruments.
2. Consistent use of pre–post designs and appropriate control groups where possible.
3. Large enough samples to be meaningful.
4. Assessment of long-term effects
5. More diverse populations.

Researchers may have to take the lead and initiate investigations because in our experience, the majority of artists/teaching artists have little or no experience in research methodology. Obviously, not all collaborations would lend themselves to RCTs; convenience sampling would often be necessary. To this end, the authors have contacted the president of an organization representing over 800 senior theatre companies throughout the country. We asked her to distribute a brief questionnaire (a modification of Hobfoll's Community Mastery Scale) to her director members. In turn, they would give the scale to each senior actor in each company before and after the rehearsal/performance process to determine the degree to which the social support inherent in weeks of working together would boost self-perceived mastery. When the pilot data are in, the practicality of this type of indirect data collection (researcher to umbrella organization to individual company directors to participants) can be assessed.

Hundreds of local websites for organizations catering to elders engaged in participatory arts can be easily found. Collaborative investigations

between area researchers and artist-teachers in such venues might go a long way toward building a more extensive and cohesive knowledge base. For example, EngAGE (2010), based in Los Angeles, offers professional arts instruction to over 5,000 seniors residing in 27 primarily low-income apartment buildings. It seems highly likely that such arts organizations would welcome inquiries from researchers about setting up individual studies on their drama, dance, and other participatory arts programs, since increased evidence of their value to society could make a more persuasive case for funding. Therefore, the ball appears to be in the researcher's court. We hope this study can serve as a call to arms to investigate this vastly under-investigated area. An internet search with terms such as "older adults and arts" followed by the name of the city nearest to the researcher's college or university should uncover many opportunities. If even a few research communities initiate additional rigorous collaborative studies, participatory arts may stand on a much stronger footing as valuable evidence-based additions to the senior health toolkit.

Supplementary Material

Supplementary material can be found at: <http://gerontologist.oxfordjournals.org>.

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