Participatory Arts for Older Adults: Benefits and Challenges

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Presented at the Workshop on Research Gaps and Opportunities for Exploring the Relationship of the Arts to Health and Well-Being in Older Adults. Washington, DC: September 14, 2012

Two Forms of Benefits

- 1. Enhancing Healthy Cognitive/Physical Aging
- 2. Treating existing disease

Far Fewer Studies have been done on Enhancement than on Remediation

Acting is ...

Multi-modal

Cognitive
Emotional
Physiological
Activating

Novel

No participant had had any acting training or experience

Engenders strong social support

Demonstrating the Acting Process

Four Core Principles:

1. Reality of Doing
2. Imaginary Circumstances
3. The Goal and the Obstacle
4. Spontaneous Performance

The Theatre Intervention

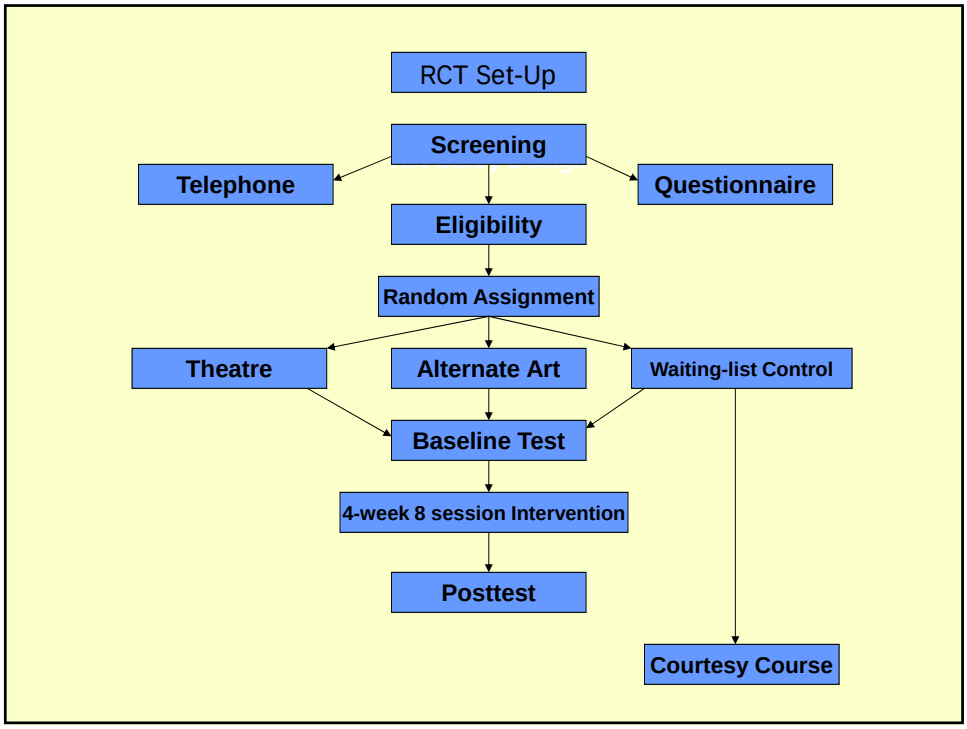
Two stages:

- Script Analysis
- Active Experiencing (Being in-the-moment while engaging in an exact rendition of learned material)

Progressively more complex classes

Experimental Parameters

- Same intervention with different:
- Populations
- Controls
- Measures
- Teachers



Results of a Recently Completed Experiment

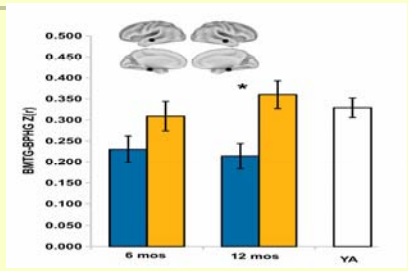
- Acting group improved significantly on 7 of 8 cognitive measures
- Improved against the No-treatment Control group and the Singing group
- Both groups had higher personal growth scores

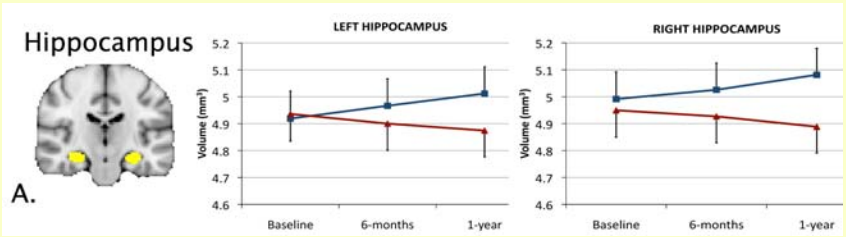
Current Study

Research Question:

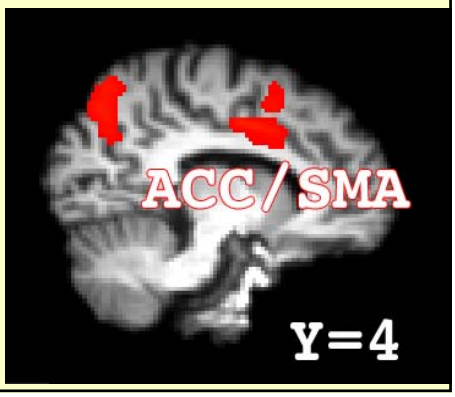
Can we demonstrate changes in brain function in an “active experiencing” acting group compared to a “About Theatre” control group.

A little history of intervention effects on cognition & brain ....





A little history of intervention effects on cognition & brain ....



Other Participatory Arts Investigations

- Dance
- Music
- Visual Art
- Expressive Writing

Gaps

- Comparatively Few Investigations Overall -- but even Fewer RCTs
- Lack of Control Conditions that Pinpoint Underlying Mechanisms
- Very Few Artist/Researcher Collaborations

Thoughts on Future Participatory Arts Studies

- Sketching and Painting RCT
- ArtAge as a Resource
- EngAGE as a Resource
  (e.g. Burbank Senior Artists Colony)

Desired Elements

- 1. Standardized measures and common vocabulary
- 2. Comparable behavioral outcomes so that effectiveness across interventions can be assessed.
- 3. Consistent use of pre-post designs and appropriate control groups

cont'd

CONT'D

- 4. Large enough samples to be meaningful
- 5. Assessment of long-term effects
- 6. More diverse populations

Acknowledgements

This work is supported by the following grants from the National Institute on Aging

1 RO1 AG036682-01

1 R15 AG032120-01

1 R15 AG026306-01

1 R15 AG018266-01

Aging and the Arts: Making music



Nina Kraus

Northwestern University

Roadmap

Aging

communication challenges

biology

our biological approach – cABR

Lifelong musical experience enhances communication and biology

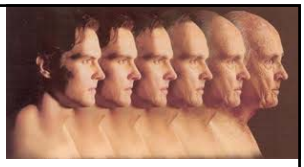
children, young adults, SPOTLIGHT on OLDER ADULTS

Research Gaps

Future Directions - making a case for music for healthy aging

Aging

Communication challenges

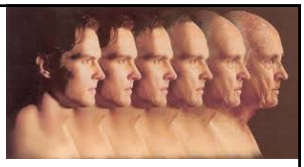


…hearing in noise
(Souza et al., 2007; Hargus & Gordon-Salant)

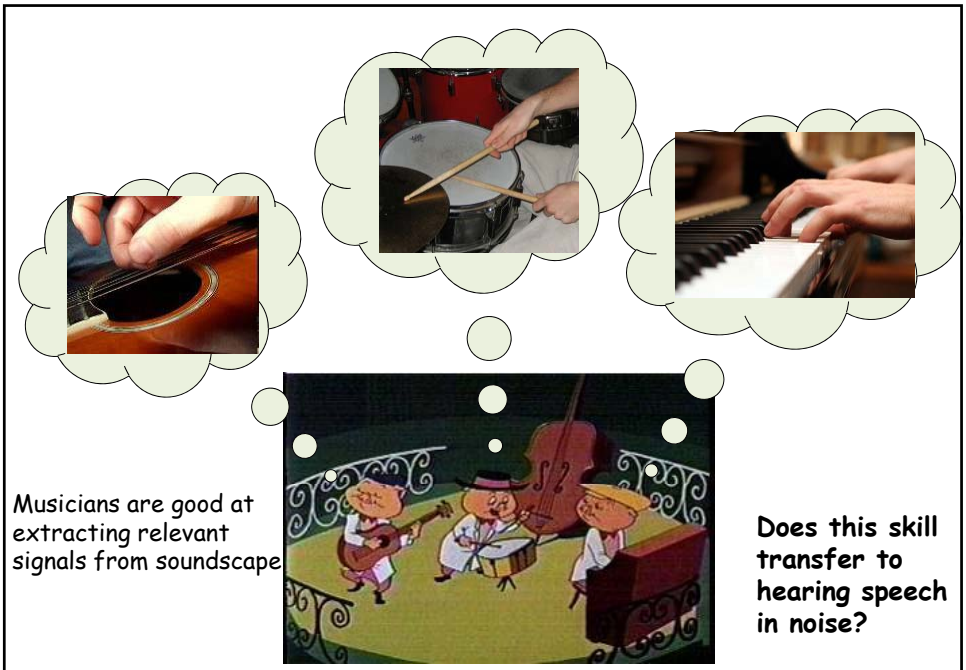
…auditory memory
(Zacks et al., 2000)

social isolation…depression..poor quality of life

Aging



Remedy to overcome effects of aging?



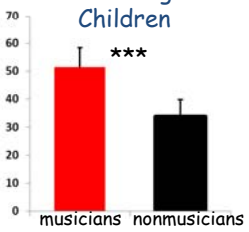
Musicians are good at extracting relevant signals from soundscape

Does this skill transfer to hearing speech in noise?

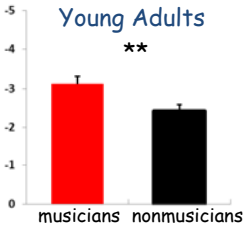
***music* training**

enhanced ***hearing in noise*** across the lifespan

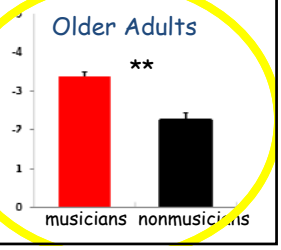
School-age Children



Young Adults



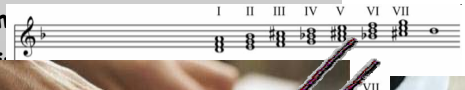
Older Adults

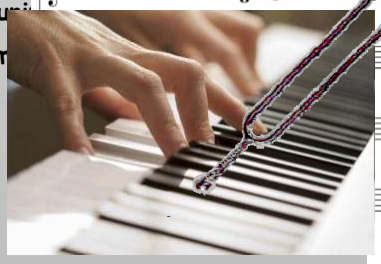


Parbery-Clark et al., *Ear Hear*, 2009
Parbery-Clark et al., *PLoS ONE*, 2011
Zendel & Alain *Psychol Aging*, 2011
Strait et al. (in progress)

music training involves..

- Memorization of sound and visual patterns
- Mem
- Tu
- Im

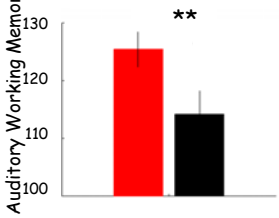




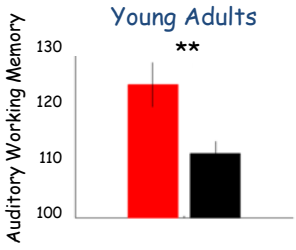
music training

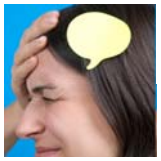
enhanced *working memory* across the lifespan

School-age Children



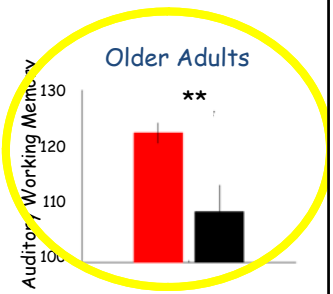
Young Adults





Not visual working memory

Older Adults



musicians
nonmusicians

Parbery-Clark et al. (2009) *Ear Hear*
Parbery-Clark et al. (2011) *PLoS ONE*
Strait et al. (in progress)

Aging

Biology

Neural timing – slowing down

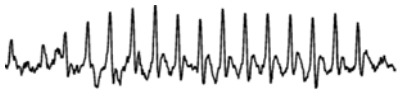
(Caspary et al, 2008; Grose & Marmo, 2010; Harris et al., 2010; Lister et al., 2011; Ross et al., 2010; Walton et al., 2010; Tremblay et al., 2003; Humes et al., 2010)

- Decreased inhibition (Caspary et al., *Exp Gerentol*, 2005)
- Broader neural tuning (Juarez-Salinas et al., JoN 2010; Recanzone et al. 2012)
- Longer neural recovery (Walton et al., JARO, 2008)
- ↑ neural noise (Juarez-Salinas et al., JoN 2010)

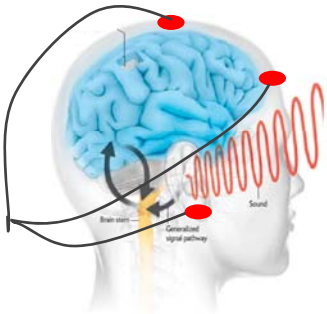
Our biological approach—cABR

cABR

auditory brainstem response to complex sounds

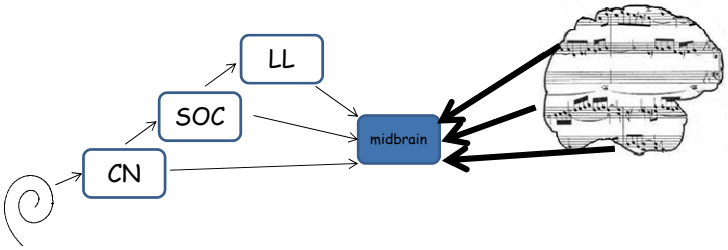


midbrain
(largely)
Convergence

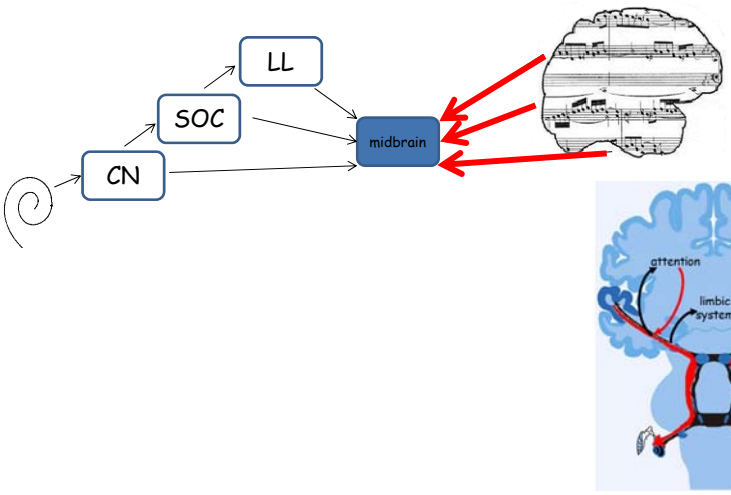


midbrain has critical role in learning

(e.g.,Suga & Ma, *Nat Rev Neurosci, 2003;* Bajo et al., *Nature Neurosci,* 2010)



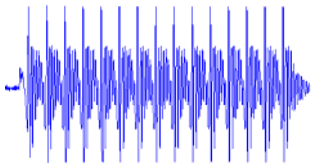
cABR attribute 1: experience dependent



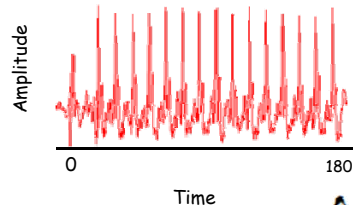
Kraus, Strait & Parbery-Clark (2012) *Hear Res*; Kraus et al. (2009) *Nat Rev Neurosci*; Strait et al. (2011) *Neurobiol Learn Mem*; Strait et al. (2009) *Ear Hear;* Strait et al. (2010) *Hear Res*; Strait et al. (in press) *Brain Lang*

cABR attribute 2: fidelity to the signal

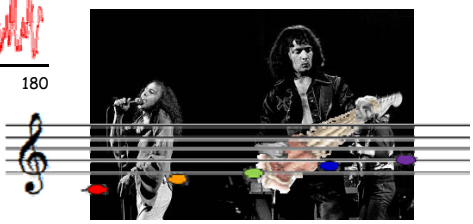
cABR attribute 3: meaningful in individuals



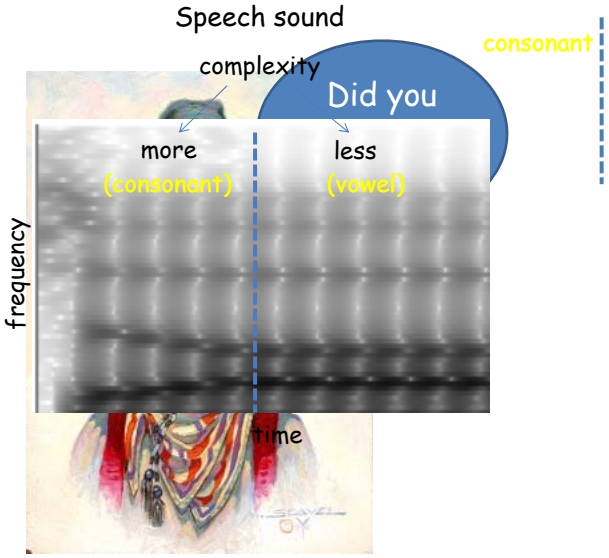
sound "da"



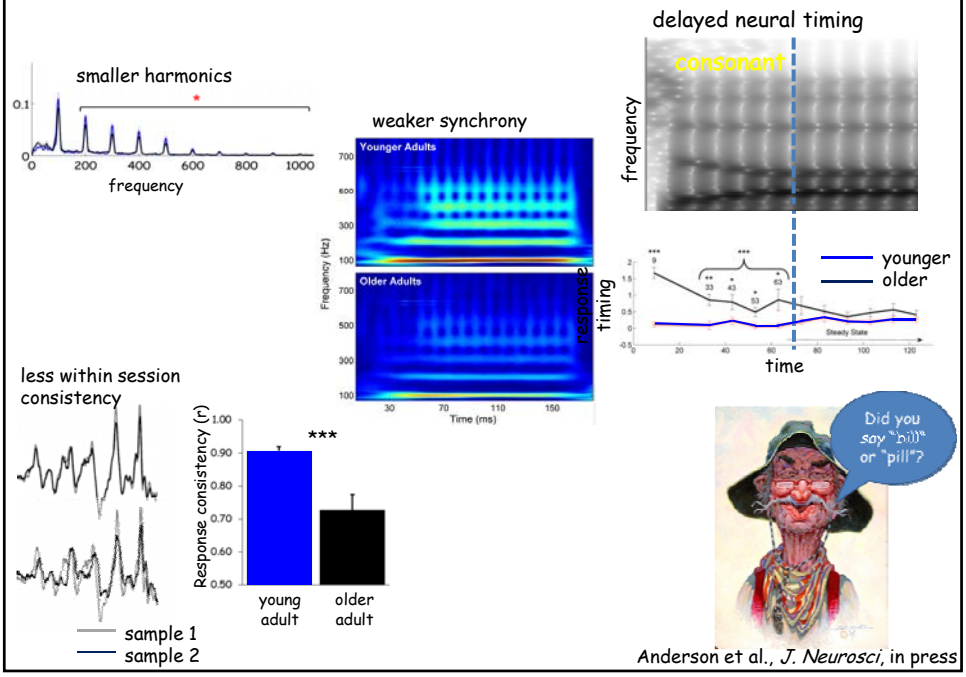
cABR to "da"



Communication challenges



Biological effects of aging



Anderson et al., *J. Neurosci*, in press

Biological effects of aging (summary)

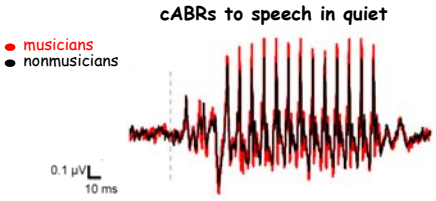
Through lens of cABR, we see impact of aging on

- Timing
- Harmonics Magnitude
- Synchrony phaselocking
- Consistency
- Neural noise

Reversing aging's effect on communication

music training

enhances ***neural encoding of sound***

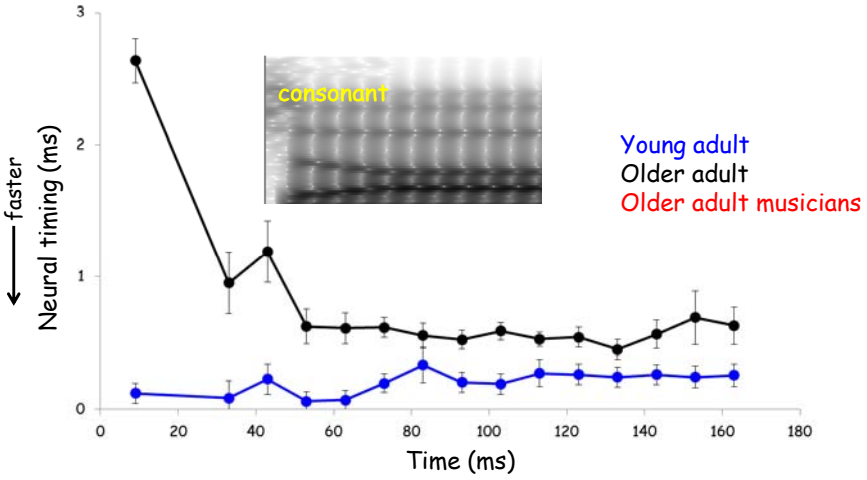


Parbery-Clark et al. (2009); Parbery-Clark et al. (2012); Strait et al. (in press)

***music* training**

spotlight on older adults

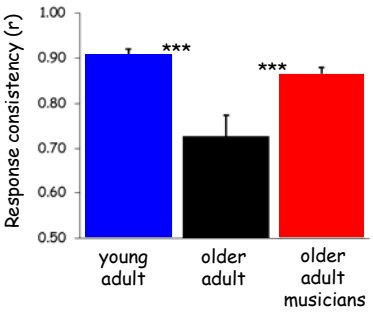
Musical experience *maintains* neural timing

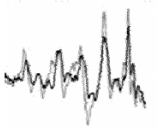


***music* training**

spotlight on older adults

Musical experience *increases* neural consistency



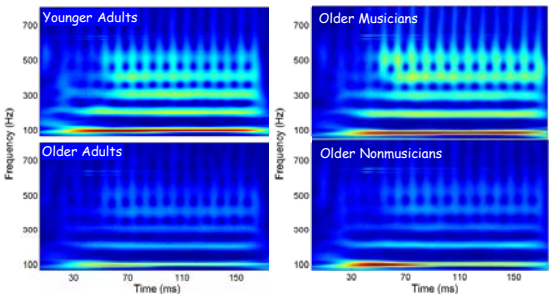


Anderson et al., *J. Neurosci*, in press

music training

spotlight on older adults

Musical experience enhances neural synchrony - phaselocking

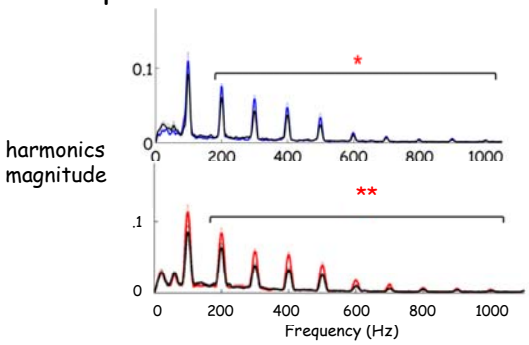


Anderson et al., *J. Neurosci*, in press

music training

spotlight on older adults

Musical experience enhances harmonics magnitude

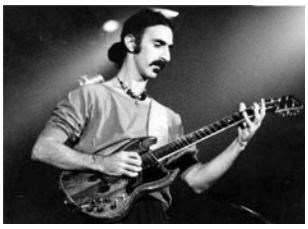


Younger adult nonmusicians | older adult nonmusicians | older adult musicians

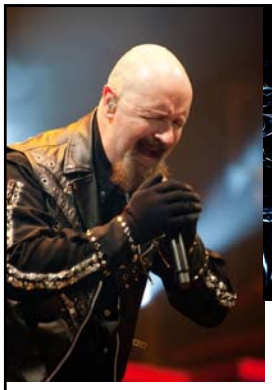
Anderson et al., *J. Neurosci*, in press

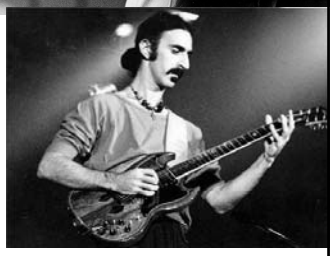
music training

Music promotes…
- improved hearing in noise,
- auditory memory,
- and biological processing of sound



Aging the anti-music…
- declines in hearing in noise,
- auditory memory,
- biological processing





INTERIM SUMMARY

a lifetime of making music positively impacts:
- communication skills
- cognitive function
- biological health

music training

Reseach Gaps

What about initiating/resuming music training late in life?

Is music unique?
How does music compare to other forms of training?

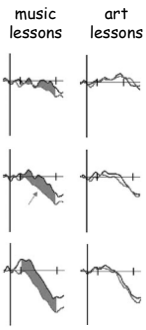
Clues from short-term training:

contrasting music with other forms of training in kids

nonmusic training in older adults

contrasting music with other forms of training: music vs. art

Brain responses to speech sounds:



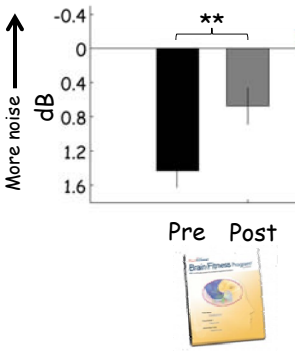
Reading & verbal IQ enhancements in musically-trained children

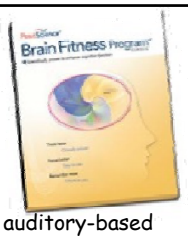
likewise: Francois et al., 2012; Moreno et al., 2011; Schellenberg, 2004; Besson et al., 2007

Moreno et al. (2009) Cerebral Cortex

contrasting music with other forms of training older adults

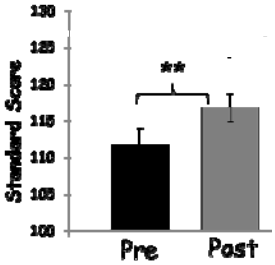
Hearing in Noise



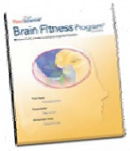


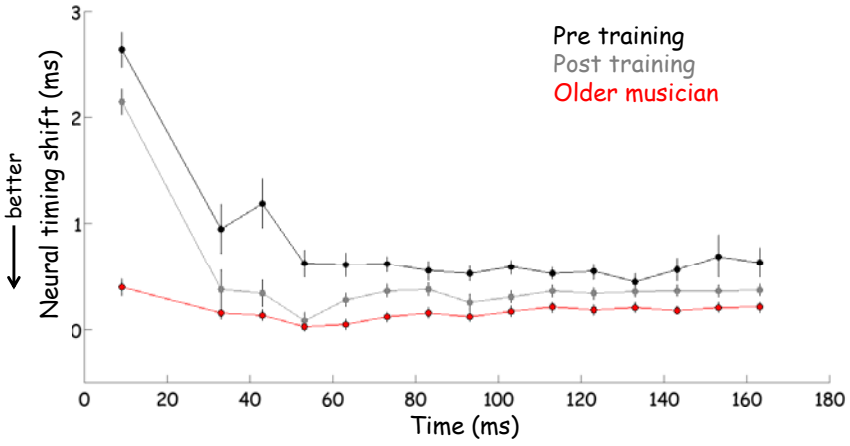
auditory-based
cognitive training
n ~ 100

Working Memory



contrasting music with other forms of training older adults





Summary I

BIOLOGY

Through lens of cABR, we see biological impact of:

Aging	Lifelong Music	Short-term nonmusic training
Timing	★	★
Harmonics magnitude	★	
Synchrony phaselocking	★	
Consistency	★	
Neural noise		

Biological basis
for improvements in hearing in noise and auditory memory in older adults

Summary II

Aging effects

communication—hearing in noise, memory
biological—cABR

Offset by a lifetime of music training

Offset by computer-based, nonmusic training

Contrasting music with other forms of training

music trumps art for communication & biological benefits in children

Research gaps:

What is the impact of initiating, resuming musical education late in life?
Is music unique?
How does music compare to other forms of training?

Does the older adult brain profit from musical training early in life?

How to obtain large-scale biological outcomes in humans? ...cABR I-pad/headband

music training

initiating music training late in life?

We think it should work!!

- Short term music training works in kids
- Short term nonmusic training works in older adults

Music is powerful

Overlap in auditory system biology for speech and music

Precision required for music processing greater than for speech

Emotion induces plasticity

Repetition—extensive practice tunes system

Attention—focusing on details of sound

do you need a lifetime of musical practice?

Patel (2011) Front Psychology

Auditory Neuroscience Laboratory

Lab Manager: Trent Nicol
Project Coordinator: Rafael Escobedo

Doctoral Students: Dana Strait, Alexandra Parbery-Clark, Samira Anderson, Jennifer Krizman, Erika Skoe, Jessica Slater, Karen Chan

Post Doctoral Fellow: Adam Tierney

Undergraduates: Emily Hittner, Hee Jae Choi, Emily Spitzer, Victor Abecassis

Research Assistants: Travis White-Schwoch, Samantha O'Connell, Margaret Touny, Sarah Drehobl

Collaborating faculty: Ric Ashley, Ann Bradlow, Steve Zecker, Sumit Dhar

Supported by:
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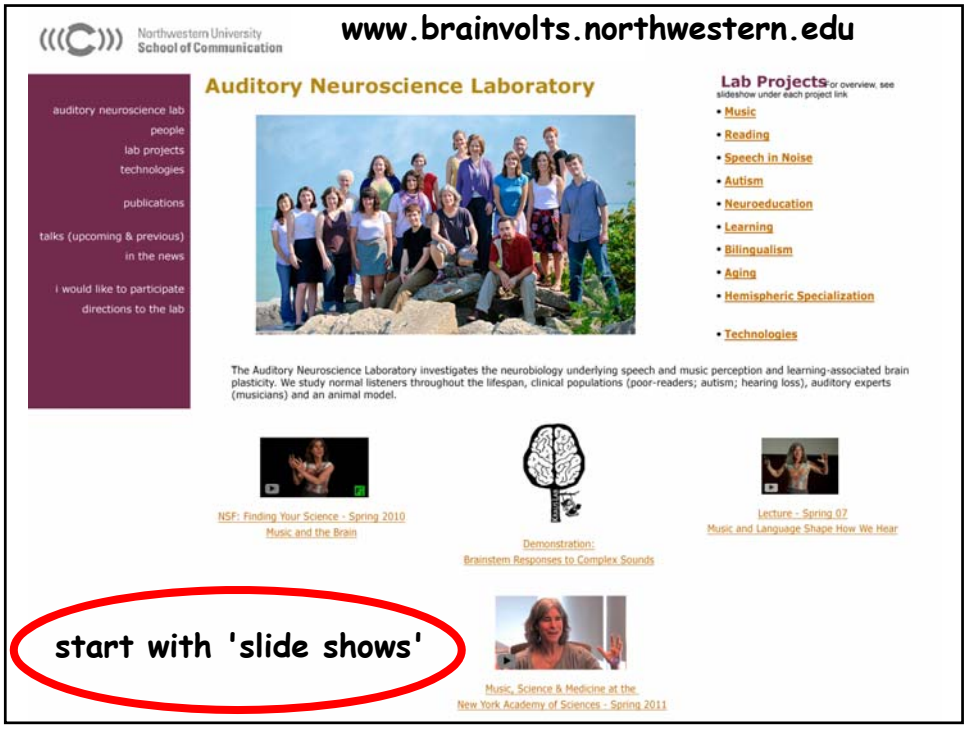
GRAMMY Fndn
Knowles Hearing Center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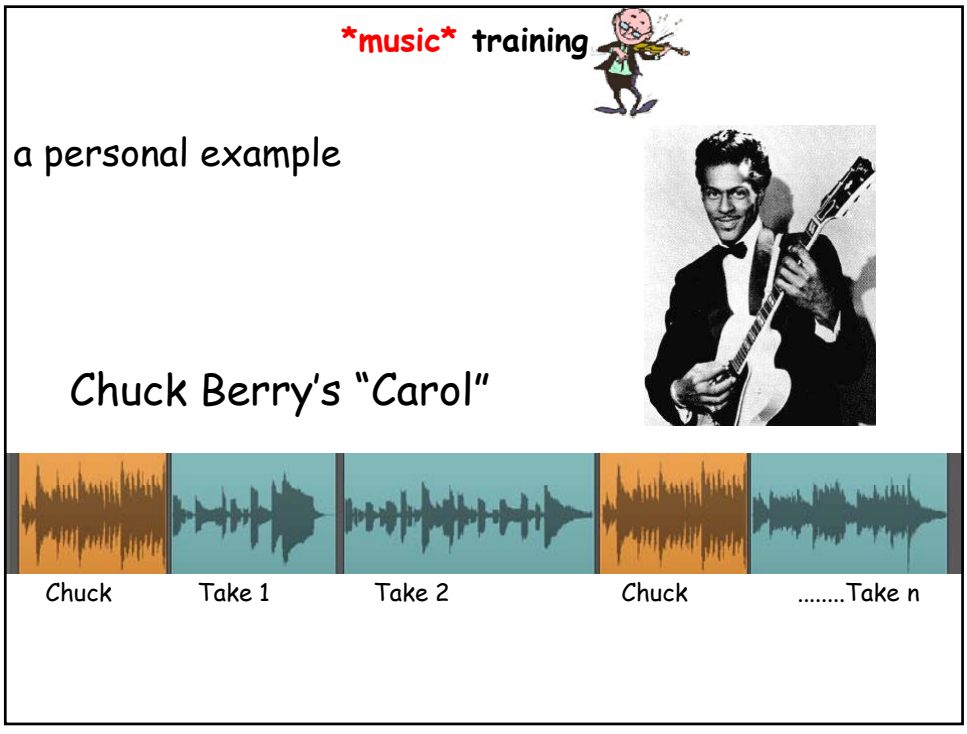
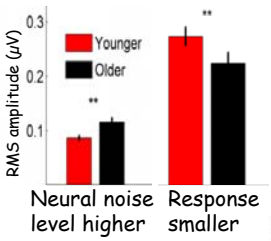
auditory neuroscience lab
people
lab projects
technologies
publications
talks (upcoming & previous)
in the news
i would like to participate
directions to the lab
Auditory Neuroscience Laboratory
Lab Projects
• Music
• Reading
• Speech in Noise
• Autism
• Neuroeducation
• Learning
• Bilingualism
• Aging
• Hemispheric Specialization
• Technologies
The Auditory Neuroscience Laboratory investigates the neurobiology underlying speech and music perception and learning-associated brain plasticity. We study normal listeners throughout the lifespan, clinical populations (poor-readers; autism; hearing loss), auditory experts (musicians) and an animal model.
NSF: Finding Your Science - Spring 2010
Music and the Brain
Demonstration:
Brainstem Responses to Complex Sounds
Lecture - Spring 07
Music and Language Shape How We Hear
start with 'slide shows'
Music, Science & Medicine at the
New York Academy of Sciences - Spring 2011


music training
a personal example
Chuck Berry's "Carol"
Chuck
Take 1
Take 2
Chuck
.....Take n

software-based training

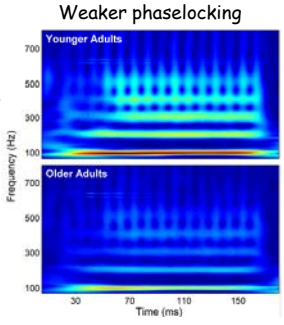
Biological effects of aging



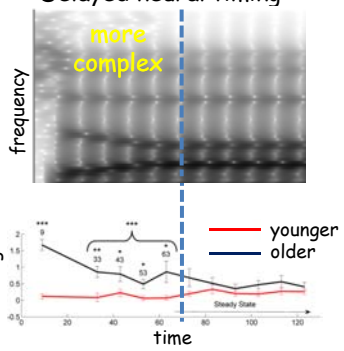
Neural noise level higher

Response smaller

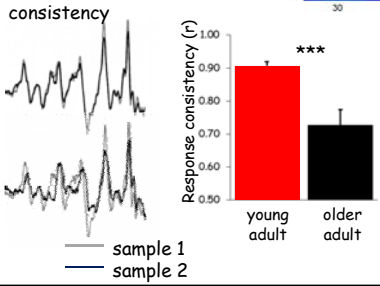
Weaker phaselocking



Delayed neural timing



Less within session consistency



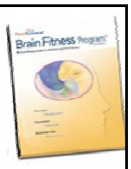
Anderson et al., *J. Neurosci*, in press

music training

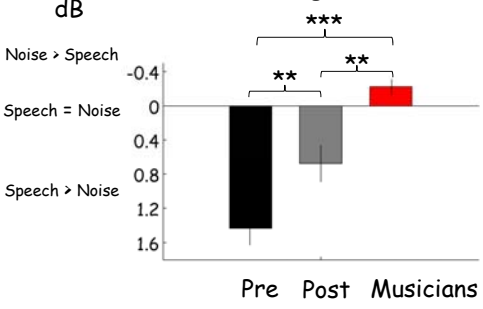
enhanced *speed of processing* across the lifespan

- speed of processing slide across the lifespan? backward masking

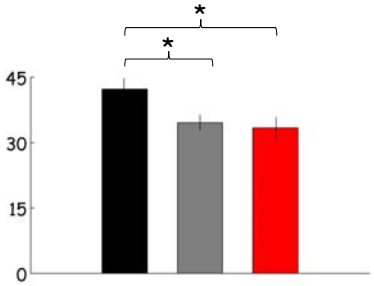
contrasting music with other forms of training



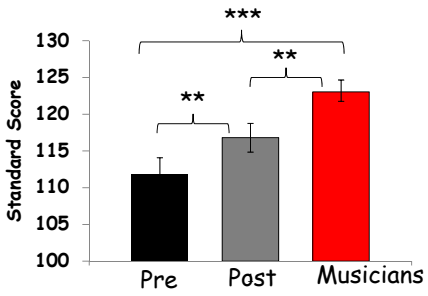
Hearing in Noise



Speed of Processing



Working Memory



music training

how to work in a little goes a long way work?

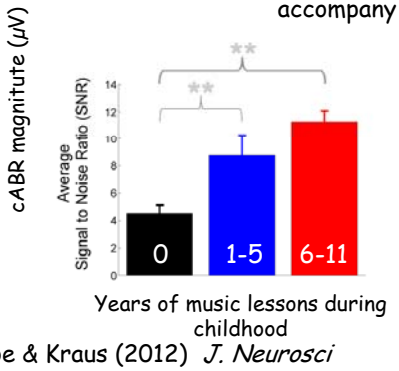
Research Gap:
Does the older brain [illegible] from early musical experience?

What happens after you stop playing music????
Does the brain continue to profit?

YES!

how to work in a little goes a long way work?

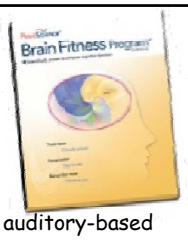
young adults w[illegible] instrument
as a child exhibit neural changes that
accompany musical training



Skoe & Kraus (2012) *J. Neurosci*

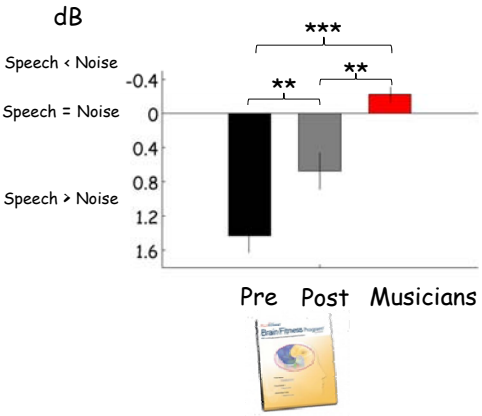
Research Gap:
Does the older brain profit
from early musical experience?

contrasting music with other forms of training

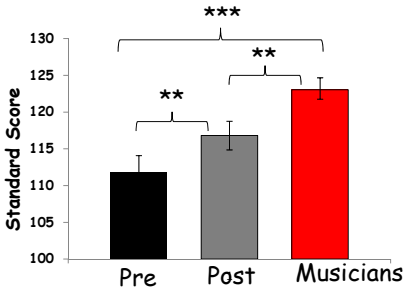


auditory-based
cognitive training

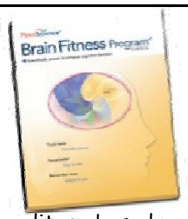
Hearing in Noise



Working Memory

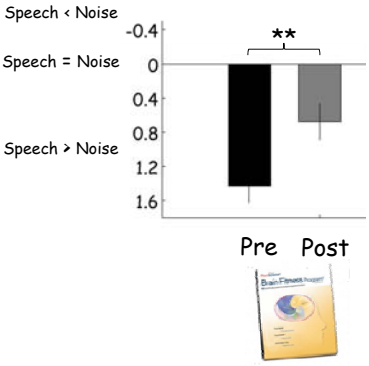


contrasting music with other forms of training

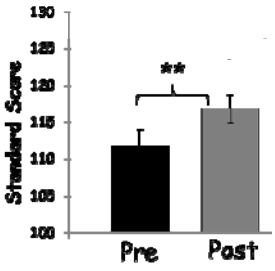


auditory-based
cognitive training

Hearing in Noise



Working Memory



Roadmap

Aging

communication challenges

biology

our biological approach – cABR

Lifelong musical experience enhances communication and biology

children, young adults, SPOTLIGHT on OLDER ADULTS

Research Gaps

Initiating or *resuming* music training in old age

Is music unique?

contrasting music with other forms of training

Future Directions - making a case for music for healthy aging

Note: this slide is not for the talk, but it is for you to see the group characteristics; note that half of the high-activity musicians are no longer playing, and that low-activity musicians have very limited years of musical activity (1-9 years); high activity musicians needed to have at minimum 10 years of musical experience, which for a 70 year old is not a lot, but they never state how many in the high-activity group actually had 10 years (the mean for this group was 35.5 years). The fact that they saw differences in the high-activity group, This is how they reach their conclusion of needing at minimum 10 years of musical training to achieve the benefits.

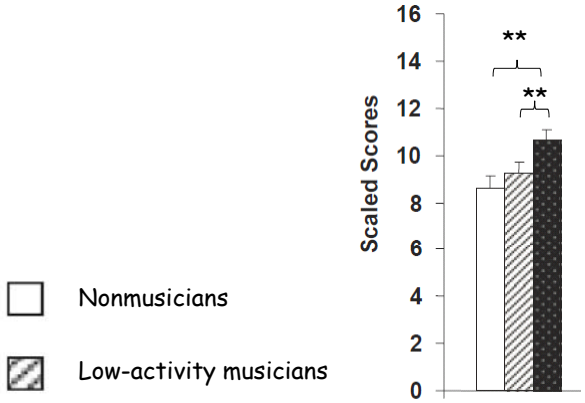
Table 1
Means (SDs) of Subject Characteristics and Screening Measures

Total (n = 70)	Nonmusicians (n = 21)	Low activity musicians (n = 27)	High activity musicians (n = 22)
Age	69.7 (7.9)	69.5 (6.6)	70.8 (6.3)
Education	16.2 (2.5)	17.4 (2.2)	17.6 (2.6)
MMSE	29 (1.1)	29.3 (.87)	29.3 (.70)
Edinburgh Handedness Inventory	73 (52.5)	73.9 (36.4)	81.8 (16.6)
Years of formal musical training	0	3.3 (.95)	3.5 (.96)
Age of acquisition	0	10.4 (5.9)	9.7 (7.2)
Years actively playing instrument	0	3.8 (2.7)	35.5 (24.7)
Subjects playing multiple instruments	0	33.3%	86.4%
Currently playing	0	11.1%	45.5%

Note. MMSE = Mini Mental State Examination.

Hanna-Pladdy & MacKay, 2011

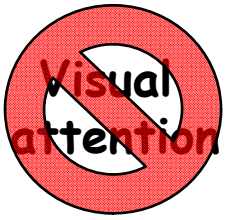
Visuospatial sequencing and cognitive flexibility



Nonmusicians

Low-activity musicians

High-activity musicians



Hanna-Pladdy & MacKay, Neuropsychology, 2011

Shall I Compare Thee to a Dose of Donepezil?

An Overview of
Intervention Research in Dementia Care

Kate de Medeiros, PhD and
Anne Basting PhD

MIAMI UNIVERSITY

UNIVERSITY of WISCONSIN UWMILWAUKEE

Challenge

- To slow or eliminate symptoms of cognitive decline
- 2,900 studies since 2000
- Very little impact

Our Goal

Assess systematic and integrative reviews of pharmacological and non-pharmacological intervention research (with a focus on arts-based), and to guide future arts-based intervention research.

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Method

Review of Systematic and Integrative Reviews

-search according to criteria

-read, eliminate according to criteria

-categorize results according to

-cognition

-quality of life

-neuropsych symptoms

Novel approach with limitations

-most recent research is missed (publication lag time)

-inconsistent terminology

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Systematic Review

Inclusion Criteria

- 2000+
- English
- PubMed
- "Intervention", "Alzheimer's Disease", "Dementia"

Exclusion Criteria

- Non-human
- Focus solely on caregiver
- Focus on biomarker
- Non-English

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Results: Sytematic/pharma

Cognition

- Birks and Harvey (2006) Donepezil improved cognition but not QofL. Significant side effects over placebo.
- Olazarán et al (2010), Donepezil plus cognitive stimulation

Neuropsych Symptoms

- Sink, Holden and Yaffe (2005), overall, not significant side effects far outweigh modest benefits

QofL

- No results
- Complication of people with dementia higher reporters of QofL than caregivers.

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Results: Sytematic/non-pharma

Cognition

- Cognitive Stimulation (dicussion/activities)
- Cognitive Training
- Reminiscence

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Results: Systematic/non-pharma

Neuropsych Symptoms

- Behavior management/modification
- Cognitive stimulation (improvements for several months)(Livingston 2005)
- Emotion-oriented care (Finneman 2005, improvements with mild/mod, not late stage)
- Environmental modification (Livingston 2005) reduction in exit-seeking behaviors with removal of mirrors and disguised doorways.
- Reality Orientation
- Reminiscence
- Sensory Stimulation (Ballard 2002, aromatherapy reduced wandering – countered by a 1993 study which found no effect).
- Simulated presence (family member via media) (decrease in agitation)
- Validation Therapy (inconclusive)
- TAP (activities based on individual) (reduction in negative behaviors)

Results: Systematic/non-pharma

QofL

- Behavior Modification (Graff 2007 – improved through OT)
- Cognitive Stimulation (inconclusive)
- Other/TAP (Gitlin 2008, improvement)

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Results: Sytematic/arts-based

- Livingston 2005 cites 6 RCT studies using music to reduce NPS. Evidence is "B" grade for reducing agitation short term
- Vink 2003 cite RCTs using music. Positive effects, but dinged for "poor" study quality.

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Discussion/Systematic

Non-pharma and non-pharma arts-based

- Interventions that engage **multiple cognitive domains** seem more effective (Cog stimulation, Behavior Mod)
- Interventions **tailored to individual context** seem more effective (Reminiscence, TAP)
- **Low grade of research** due to sample size, lack of clear explanation of intervention, non-experimental design, lack of control groups, and lack of clarity of "success."

Integrative Review: non-pharm & arts-based

- Allows for qualitative research
- Enables us to learn *why* studies are eliminated from or overlooked in systemic reviews.

- 2000+
- PubMed, Google Scholar
- English
- Review, Alzheimer's Disease, dementia, intervention, music, dance, theater, dance, creative, arts, drama
- Additional articles from reference lists included in published papers.
- Exclusion: not on dementia, focus on research (not intervention), focus only on caregiver, non-human, non-English.

Results: Integrative/non-pharma

Cognition

- Promise for improving episodic memory and executive function – but could be social (group intervention) or test performance (short term intervention).

NPS

- Validation
- Life Review/Rem
- Sensory (Snoezelen)

QofL

Results: Integrative arts-based

- Of 41 articles, only 4 met criteria (all music).
- Added 1 via Cochrane database search of dementia and storytelling.
- Added 6 studies out of 31 in Mental Health Foundation in London (2011)
  - Martin et al 2004 drum circles n = 117

  interviews and observation
  increased mastery, pleasure, communication
  - Phillips (2010) n= 56 storytelling
    increased pleasure and communication
  - Lepp (2003) n= 12 pwd, 12 caregivers drama workshops and cg focus groups, reported greater bonding with pwd.

Integrative/arts-based

Cognition

- None

NPS

- Witzke 2008, 11 music studies, 5 list sig reduction in agitated behaviors
- Sung & Chang 2005, "preferred" music. 7 of 8 studies show reduction in "aggressive" behaviors.
- Brownell 2008, visual art had lower "fear" and verbal agitation

QofL

- Skingley and Vella-Burrows (2010) 5 studies of music, all reporting higher qual of life. Limitations, but low cost and no adverse effects.

- Van Dijk 2012 drama more positive than rem group for INTERACT and QUALIDEM. n=71 cg, 36 pwd
- Kinney 2008, participatory art-making, higher qual of life than "other" activities. N=12

Discussion: Integrative Review

- Social connectedness is strength of non-pharm and arts-based
- Low-cost
- Ease of implementation
- Multi-modal (might not be possible to isolate elements)

Discussion/Conclusions

We are using the wrong tools for the job.

- Arts-based interventions are multi-modal, multi-leveled, and have subtle changes.
- RCT are neither possible nor desirable.
- Many measurement tools currently being used are a poor fit to capture impact.

Discussion/Conclusions

Focus on finding the mechanisms.

- Go beyond whether it is music, dance, or theater.
- What senses are engaged and how? Is it participatory? Does it facilitate growth?
- We need to understand the multiple mechanisms at play.

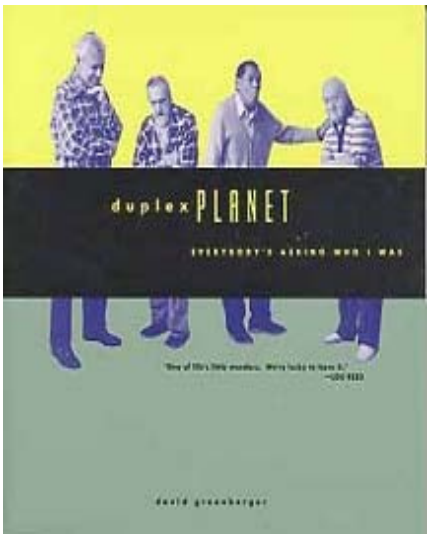
Discussion/Conclusion

Tell us what is going on in the intervention.

- Saying that it's dance (or music or…) isn't enough.
- Deep descriptions will help identify mechanisms and measurement tools.
- This will also clarify who can provide the program and deepen conversations between therapists and artists.

Discussion/Conclusion

- Develop/measure interventions that are tailored to individual/context (past and present).
- "everybody's always asking who I was."



Discussion/Conclusions

Focus on the impact beyond the individual.

- Arts-interventions show promise in creating connectedness with care partners, friends, family etc.
- Artistic products can create social capital for person with dementia.

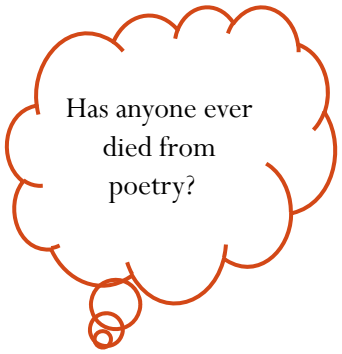
Discussion/Conclusions

- That said, the coming challenge is that people are/will be living at home. Isolated.
- We must imagine/measure interventions that can engage people outside of congregate care settings.

Discussions/Conclusions

Explore cost-effectiveness of arts-based interventions and side-effects.

We should **loudly question** why low cost, low side-effect interventions are not implemented while some high-cost, pharmacological interventions with adverse side-effects are widely implemented.



Discussion/Conclusions

Support collaborations between researchers and arts-based practitioners.

- Demonstration sessions observed by seasoned researchers can deepen understanding of mechanisms and yield descriptions with fresh eyes.

Thank you

- Dr. Jennifer Kinney
- Dr. Susan McFadden
- NAS

And you…

Using Music to Manage Symptoms of Dementia:
What is the state of the science?

Julene K Johnson, BM, PhD

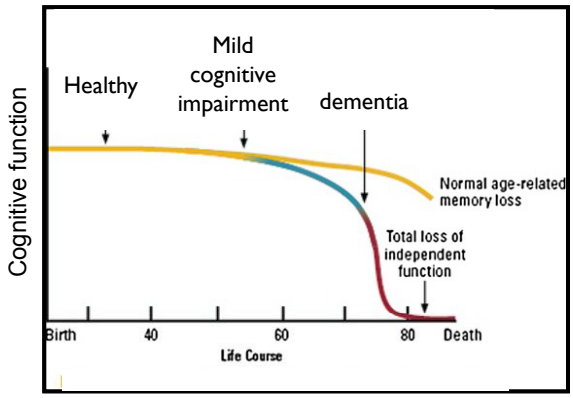
Institute for Health & Aging
Department of Social and Behavioral Sciences
Department of Neurology
University of California, San Francisco

Fulbright Scholar 2010
"Community choirs and well-being of older adults in Finland"

Overview of Talk

- Cognitive decline in older adults & the need for more effective strategies
- Studies using music to manage symptoms of dementia
  - Behavioral and cognitive (but not motor for this talk)
- Other pharmacological / non-pharmacological interventions for persons with dementia
- Opportunities and research gaps

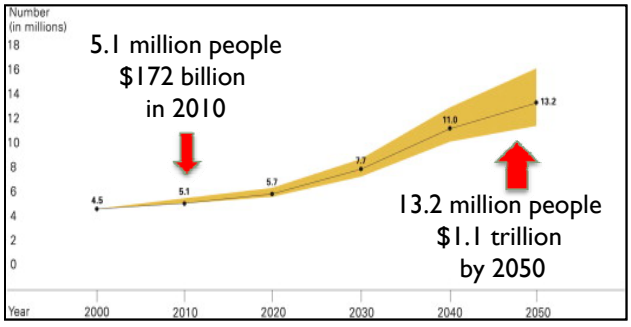
Cognitive function over the lifespan



Neurodegenerative diseases
- Alzheimer disease (AD)
- Dementia with Lewy bodies
- Frontotemporal dementia
- Corticobasal degeneration
- Parkinson disease
- Huntington disease
- Others

Adapted from National Institutes of Health (2008) publication 08-3782

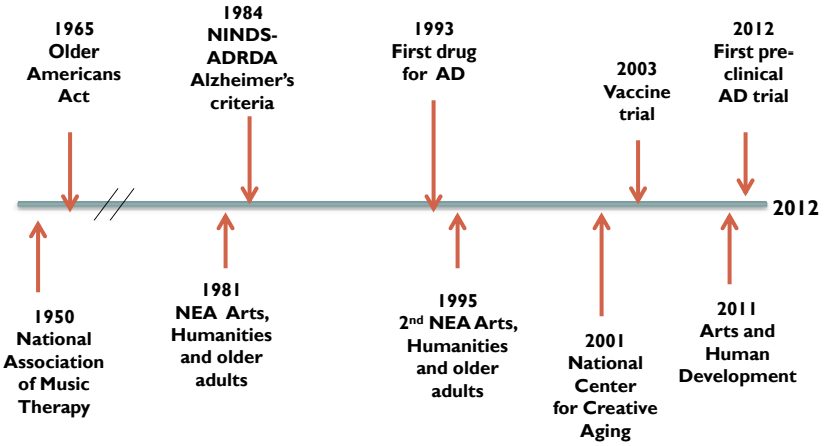
Prevalence & cost of Alzheimer disease (AD)



5 FDA-approved drugs for AD that temporarily improve symptoms

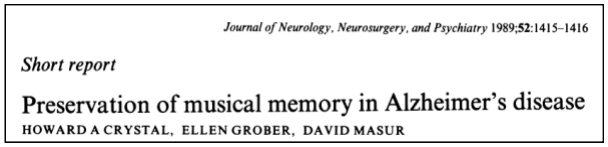
2012 Alzheimer's Disease Facts and Figures. In *Alzheimer's and Dementia*

Significant events in dementia and arts research



Early evidence for the positive impact of music on persons with dementia

- Early studies from music therapy literature (~1980s)
  - Ruth Bright; Alicia Clair; Millard & Smith; Norberg
  - Studies primarily focused on managing behavioral symptoms and increasing alertness in persons with severe dementia
- Numerous case studies about preserved music skills / music memory / creativity



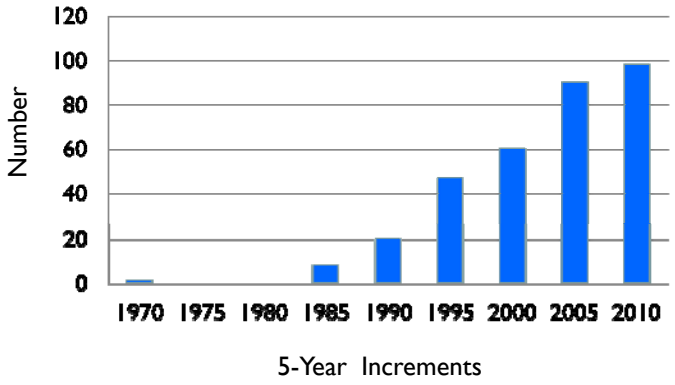
Journal of Neurology, Neurosurgery, and Psychiatry 1989;52:1415–1416

Short report

Preservation of musical memory in Alzheimer's disease

HOWARD A CRYSTAL, ELLEN GROBER, DAVID MASUR

Publications about music and dementia



1985 – 2012: ~340 articles

Music intervention studies of "adequate quality"
- Cochrane systematic reviews
- New studies

~ 24 studies

Overview of studies using music for managing symptoms of dementia

- Types of music interventions (lots of variability)
  - Music listening (live, recorded)
  - Participatory (e.g., singing, playing instruments)
  - Music therapy
  - Music + movement
- Participants / settings of studies
  - Persons with dementia (diagnosis often unclear or AD only)
  - severe stages of dementia
  - Assisted living settings
  - Sample sizes ~ 25 (range 10-60)
- Length / frequency of intervention
  - 6-8 weeks
  - 30-60 minutes @ 2-3 times per week

Overview of studies using music for managing symptoms of dementia

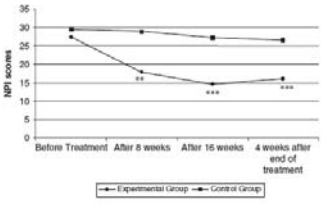
- Quantitative Methods:
  - Clinical trials (+/- randomization)
- Outcomes:
  - Behavior (agitation, depression, anxiety)
  - Cognition
  - Engagement / Alertness / Social functioning
  - Quality of Life
  - Caregiver Stress
  - Biomarkers (e.g., stress hormones)
- Other (e.g., cost effectiveness not included)

Overview of findings

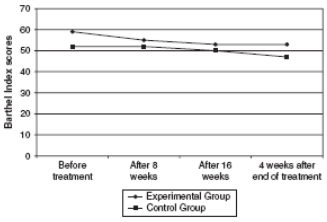
Positive findings	No effect
↓ aggression / agitation ◦ Groene (1993); Clark (1998); Gerdner (2000); Sung (2006); Garland (2007)	No change in behavioral symptoms ◦ Svansdottir (2006); Ledger (2007); Cooke (2010b)
↓ anxiety ◦ Guétin (2009); Sung (2010,2012) ; Cooke (2010); Suzuki (2007)	No change in global cognition ◦ Groene (1993); Guétin (2009); Brotons (2000); Janata (2012); Cooke (2010); Raglio (2008)
↓ depression ◦ Lord (1993); Ashida (2000); Guétin (2009); Raglio (2010)	
↓ behavioral composites and other (e.g., wandering) ◦ Groene (1993); Ziv (2007); Raglio (2008); Ragilo(2010); Han (2010)	
↑ cognitive (memory, language) ◦ Ceccato (2012); Brotons (2000)	

Example: Effect of music on behavior and function

Neuropsychiatric Inventory (behavior)



Barthel Index (functional status)



30 music therapy sessions (30 min/session) for 16 weeks + 4 week post

Raglio et al. (2008) *Alzheimer Dis Assoc Disord*

Brotons (2000)

Clark (1998)

Gerdner (2000)

Groene (1993)

Guétin (2009)

Lord (1993)

Raglio (2008)

Raglio (2010)

Sung (2006)

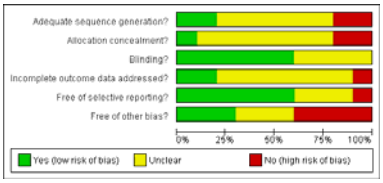
Svansdottir (2006)

Cochrane Dementia and Cognitive Improvement Group (Vink, 2011)

"There is no substantial evidence to support nor discourage the use of music therapy in the care of older people with dementia.

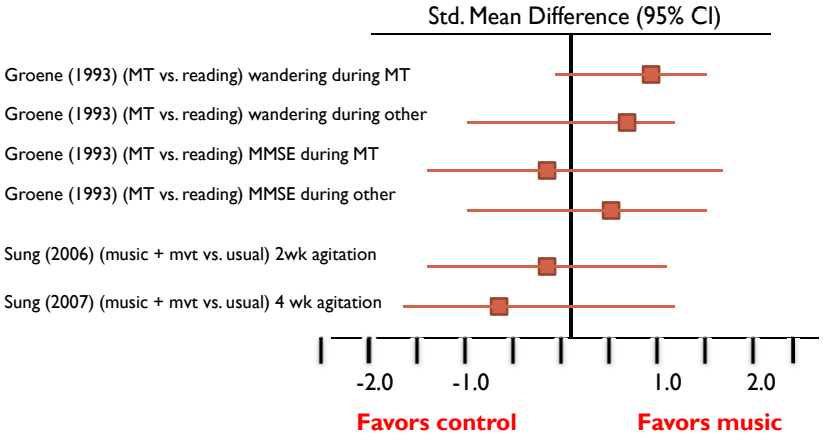
The methodological quality of these small, short-term studies was generally poor, as was the presentation of results."

Methodological Quality



Forest plots of standardized mean differences

from Vink et al. (2011) Cochrane Systematic Review



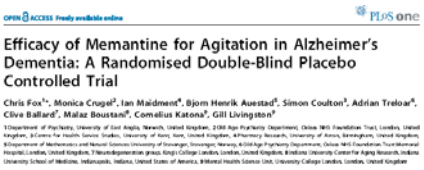
Specific concerns with music intervention studies

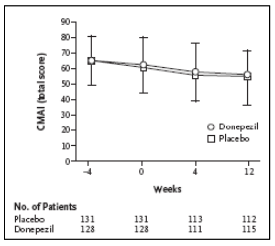
- **Samples are often poorly defined**
  - Unclear diagnoses & often lump diagnostic groups
  - Small sample sizes, often from convenience samples in assisted living
- **Methods are often weak**
  - Randomization methods often not specified
  - Design flaws (e.g., control conditions)
  - Music interventions are not well described
- **Outcomes are limited**
  - Use of only a few scales (e.g., CMAI)
  - Scales may not be ideal for measuring effects of music
- **Interpretation of findings**
  - Statistical methods are especially weak
  - Missing data (drop-outs, etc)
  - Conclusions are often over-stated

Pharmacologic treatment of agitation in AD:
donepezil & memantine

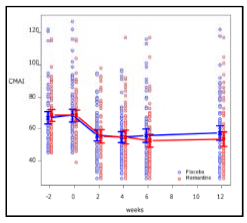

ORIGINAL ARTICLE

Donepezil for the Treatment of Agitation in Alzheimer's Disease


Efficacy of Memantine for Agitation in Alzheimer's Dementia: A Randomised Double-Blind Placebo Controlled Trial



N = 272 AD

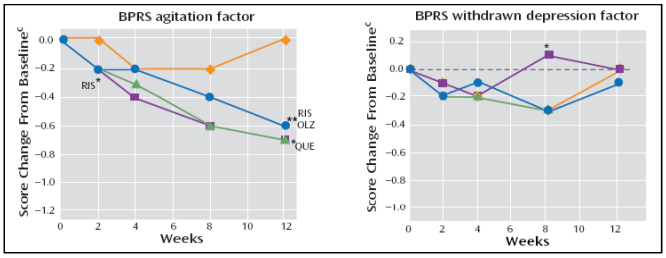


N = 153 AD

* Met International Standard Randomized Control trial criteria

Pharmacologic treatment of agitation in AD:
atypical antipsychotics

Sultzer et al. (2008) *Am J of Psychiatry*
CITE-AD Effectiveness trial



N = 421

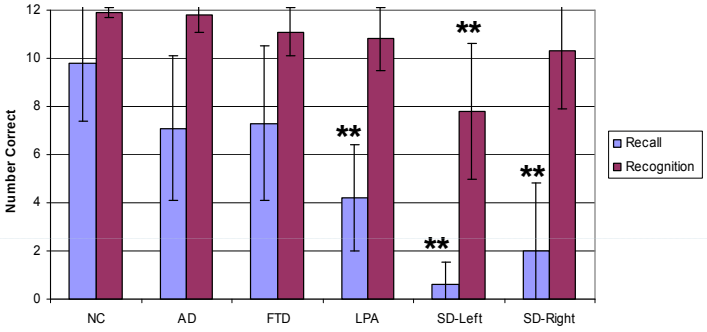
- Magnitude of benefit was small
- Risk of increased death & cognitive decline
- No effect on caregiver time (cost) or QOL

Other non-pharmacologic approaches for managing symptoms of dementia

Positive findings	No effect
• Behavior management/education (Livingston, 2005; Gauthier, 2010; Hulme, 2010; Olazarán, 2010)	• Structured activity therapy
• Family-based coping therapy for QOL (Olazarán, 2010; Cooper, 2012)	• Simple repetitive exercise
• Environmental management (Gauthier, 2010)	• Reality orientation therapy
• Hand massage/touch (Hulme, 2010)	• Animal-assisted therapy
• Physical activity / exercise (Hulme, 2010)	• Bright light therapy
	• Others

The effectiveness of music interventions may differ by diagnosis

"Name that tune" task



Johnson et al. (2011)

$p < 0.05$ vs. controls

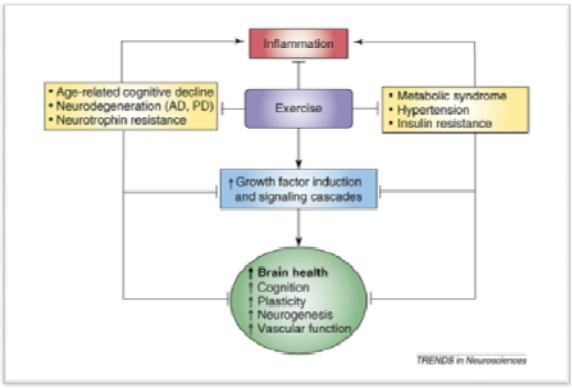
General hypothesis:

Lifestyle factors (e.g., music, exercise) can:

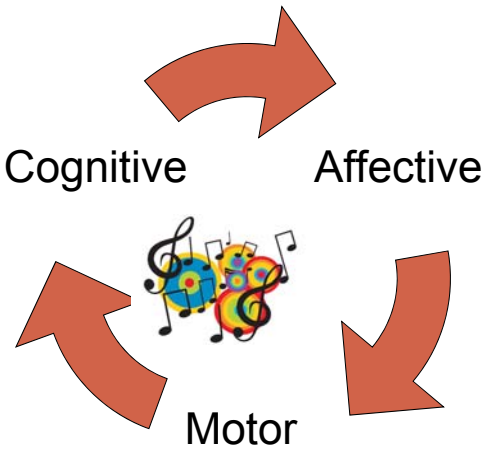
- diminish behavioral disturbances in dementia
- improve / maintain cognitive abilities
- facilitate well-being

What are the mechanisms?

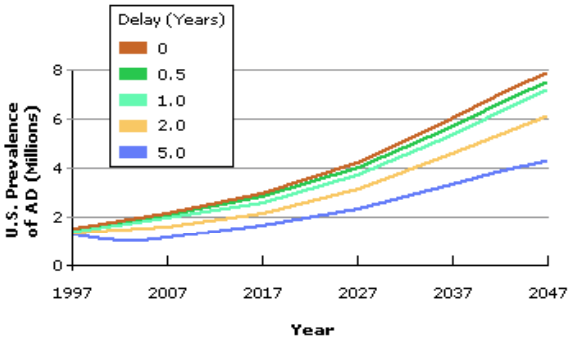
Models like those for exercise are lacking for music



Cotman et al. (2007) Trends in Neuroscience



Potential impact of interventions for delaying onset of AD



Brookmeyer et al. (2007; 2008)

Opportunities

- Because of methodological limitations, it is difficult to know whether or not music interventions are effective for managing symptoms of dementia (AD)
- Despite these limitations, there are promising trends that suggest music may be effective.
  - Several studies suggested improvements in behavioral symptoms
  - Music has the potential to improve QOL for *both* the person with dementia and their caregivers
  - Music also has the potential to be cost-effective, have minimal risk, and be accessible, including for culturally diverse older adults

Research Gaps

- Improve quality of research studies
  - Encourage cross-talk between music and dementia researchers (interdisciplinary teams, include statistician)
  - Consider using international clinical trials criteria or consult Alzheimer's Disease Cooperative Study (ADCS)
  - Include more culturally diverse older adults
- Develop better theoretical models to inform research agenda / hypotheses
- Consider novel ways to capture the effects of music on older adults
  - Increase basic research about processing / experience of music of older adults
- Consider effects on both AD and non-AD dementias
- Consider interventions in earlier stage dementia and possibly life-span approaches to music involvement
  - Treatment of neurodegenerative diseases after onset is quite challenging

Thanks to:

Fulbright Foundation

NIH / NIA

UCSF Institute for Health & Aging

San Francisco Community Music Center

A Primer on Cost Benefit Analysis

Emmett B. Keeler
RAND
Why; How; choral singing example

R

What is CBA?

- A systematic listing of all anticipated costs and effects of a spending decision.
  - All effects are given a dollar value
  - In public decisions, all of society counts
- In theory, our choice should maximize expected net benefits = (benefits – costs)
  - So if net benefits < 0, don't do the program.
  - Maximizing net benefits is economically efficient,
  - But CBA is just one input in the decision process

R

Evaluating an arts program for older people

- Pick measurable objectives
  - Collect information on them, and on all the important costs and impacts.
- Test if program "works" to improve objectives
  - Ideally, with a design that shows the gains are due to the program.
- If so, see if the program is worthwhile compared to other uses of the money.
  - This is where cost analysis comes in

R

3

Types of cost analysis

- Tables of costs and effects for each option
- Cost Only Analysis: does program save money?
  - Many worthwhile programs do not do so
- Cost-effectiveness analysis
  - Costs and one major or aggregate effect
- Cost Benefit analysis
  - Costs and the dollar value of all effects

R

4

All start with Table of Costs and Effects/Benefits

Measures of Costs and Effects

Options	Direct Costs	Indirect Costs	Medical Care offsets	Healt h	Value of Activity
A					
B					
C					

R

5

Cost effectiveness or Cost-Benefit?

- Cost-effectiveness analysis
  - Used to maximize effects within a given budget
  - CEA is standard for medical treatments.
- Cost Benefit analysis
  - Answers question: is program worthwhile?
  - Needed if health is one of many benefits
  - We have to put a dollar value on all outcomes
  - CBA is standard for regulatory impact analysis

R

6

Steps of a CBA

- Specify the alternatives precisely
- Decide which and whose benefits, costs and impacts to count
- Predict costs and impacts and monetize them
- Discount all future dollars to present value
- Calculate Net Benefit = benefits – costs
- In theory, choose programs with max. net benefit
- Do sensitivity analysis for key assumptions in the model. (inspecting the sausage factory)

R

7

Measuring costs of an intervention

- Make a list of activities
  - Set-up,
  - Continuing operation and maintenance,
  - Downstream cost offsets? (modeled)
- Collect units of labor, supplies, overhead/rent
- Costs = the sum of units x price
  - Price is given by market for most items

R

8

Issues in measuring costs

- If market for an input is distorted or non-existent, use opportunity costs for price.
- Volunteers: what else could they be doing?
  - Big issue for costing family care-givers
    - Is $0 or a wage rate more appropriate?
- "Patient" time
  - Are the arts fun (then time is a benefit not a cost)
  - Opportunity cost of time for retired people?

R

9

Combining dimensions of health

- Health programs aim to improve
  - Life expectancy
  - Functioning
  - Feeling healthy or fit
  - Comfort, absence of pain
  - Happiness, social life, feeling useful… ?
- Economists use Quality Adjusted Life Years (QALYs) to combine all health effects.

R

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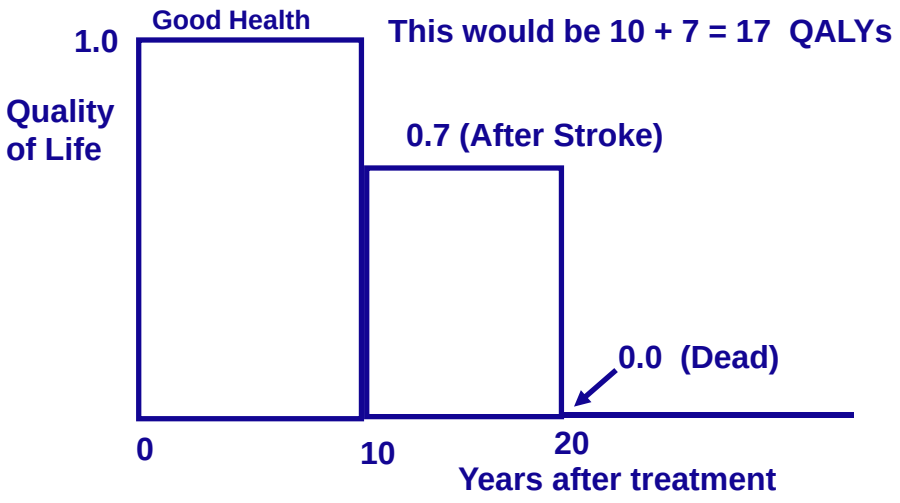
What are QALYs?



Where does the .7 come from?

- Surveys have used many methods
- Time tradeoff, e.g.
- Suppose you might live 20 more years with slurred speech, difficulty walking …

How many years would you give up if you could live instead in good health?

- If 14 years of good health~ 20 years post-stroke, then the factor = 14/20 = 0.7

R

12

Putting a dollar value on Health

- Economists use “willingness-to-pay” (WTP) as the value of non-marketed goods like health.
- We can get WTP for non-market goods from
  - Implicit choices (hazard premiums for workers)
  - Surveys (“what would you pay for …?”)
- Big literature on WTP for reductions in risk of dying, better functioning or symptomatic relief.
  - Leads to $50,000 to $250,000 as the value of an additional quality adjusted year of life.

R

13

Special issues for arts and the elderly

- Doing arts may be valued by participants for more than its health gains
  - Use WTP to get the dollar value to them
- Older people may value quality of life gains over extra years of life
  - Reflecting diminishing returns to length of life

R

14

Example: Choral Singing Program

- Trial of 160 ambulatory older adults assigned to chorale vs usual activity (Cohen, 2006)
- Professionals ran these weekly sessions
- Results/person included: (my reanalysis)
  - Better mood, self-reproted overall health (.1 sd)
  - 2 few doctor visits
  - Fewer OTC meds, falls
  - More weekly activities

R

15

Net Cost Calculation

- Costs of program: $50,000 (based on my choir)
- Medical cost offsets $200-300 person in 1st year
  - Doctors visits, OTC meds, falls
  - Total offset = 80 x $250 = $20,000
- So net costs = $50,000 - $20,000= $30,000

R

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Benefit calculation

- Benefits = $800 per person
  - Better health .01 QALYs x $50,000 = $500
  - Fun of singing, socializing = $10 x 30 = $300
  - So Total benefits = 80 x $800 = $64,000
- Benefits > Net Costs
  - ($64,000 > $30,000)
- But program is not cost-saving
  - Net costs are $30,000

R

17

That's All, Folks

- Any Questions?

Reference: Boardman AE et al., Cost Benefit Analysis: Concepts and Practice (4th Edition)

R

18

Cost and Cost Effectiveness in Translation of Randomized Control Trials to Community Evidence –based Arts Programs for Older Adults

Thomas R. Prohaska, Dean College of Health and Human Services
George Mason University
Melissa Castora-Binkley, School of Aging Studies, University of South Florida

Workshop on Research Gaps and Opportunities for Exploring the Relationship of the Arts to Health and Well-being in Older Adults

National Academy of Sciences
National Research Council
Division of Behavioral and Social Sciences and Education
Committee on National Statistics

September 14, 2012
500 Fifth St. NW
Washington, D.C. 20001

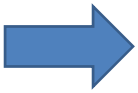
Presentation Objectives

- Briefly describe how research on the impact of the arts to health and well-being in older adults is similar to research on lifestyle and health practices such as exercise.
- Describe the overall process of translation of research to practice and the role of cost in successful translation of arts programs into evidence-based programs.
- Identify key issues and barriers in determining cost, cost effectiveness, and public health impact. replicating evidence-based practices (programs).
- Define cost and cost effectiveness in the context of public health impact
- Provide strategies for soliciting and identifying the most promising models to determine the greatest impact of participation in the arts among older adults.

Framework Questions for a Public Health Agenda in Physical Activity (PA) and Aging

1. What are the types and levels of PA among diverse older populations?
2. What are the health benefits of PA in older adults and the consequences of sedentary behavior in older adults?
3. What factors influence participation in regular PA among older adults?
4. Can we develop successful interventions and policies to promote PA in older populations, and, if so, what are the criteria on which to evaluate their success? (Prohaska, et al., 2006)

1. What are the types and levels of PA among diverse older populations?



Scope / Operationalization: How do we define the arts?

- Arts and crafts
- Art therapies
- Performing arts
- Creative arts
- Participatory arts
- Abstract / Conceptual art

1. What are the types and levels of PA among diverse older populations? *(continued)*

Intensity: Reporting research methods <u>and</u> participants involvement in arts programming

Researchers tend to be good at reporting research methods (how long observations occurred, how long a testing session lasted, how much time elapsed between measurements) but are less conscientious about reporting duration of arts participation.

E.g. Reporting Intensity of Arts Participation

**From the review by Castora-Binkley et al. 2010*

1st Author Reference	Dosage	Duration	Length	Total Sessions
Alpert 2009	?	15 weeks	?	?
Bohlmeijer 2005	?	?	2.5 hours	12 sessions
Bugos 2007	?	6 months	30 mins/week	
Cohen 2006	1 day / week	30 weeks	?	30 sessions
Kenny 2005	?	?	?	?
Noice 1999	3 days/week	4 weeks	?	11 sessions
Noice 2004	?	?	?	?
Noice 2006	2 days/week	4 weeks	1 hour	8 sessions
Noice 2009	2 days/week	4 weeks	1 hour	8 sessions

2. What are the health benefits of PA in older adults and the consequences of sedentary behavior in older adults?

What are the health benefits of arts participation in older adults?

- Positive effects on **general health** (chorale)
- Positive effects on **medication use** (chorale)
- Decreased occurrence of **falls** (chorale)
- Better **cognition** (theater; piano)
- Improved **balance** (dance)
- Decrease in **hostility, anxiety and depression** (reminiscence and creative expression; improve training)
- Increased sense of **mastery** (reminiscence and creative expression)
- increased **well-being** (theater; chorale; drawing and painting)

3. What factors influence participation in regular PA among older adults?

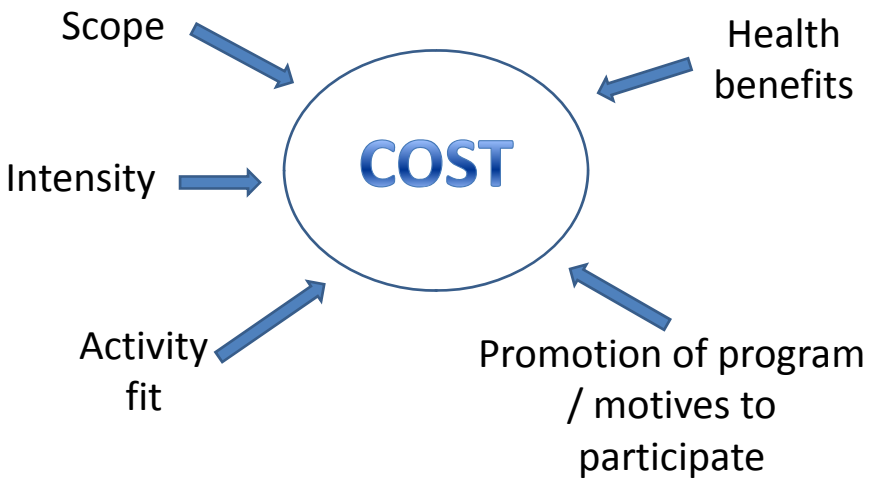
What factors influence participation in arts programs among older adults?

- Past experience
- Perception of the activity
- Motives to participate and maintain participation
- Activity fit (maintenance of participation)

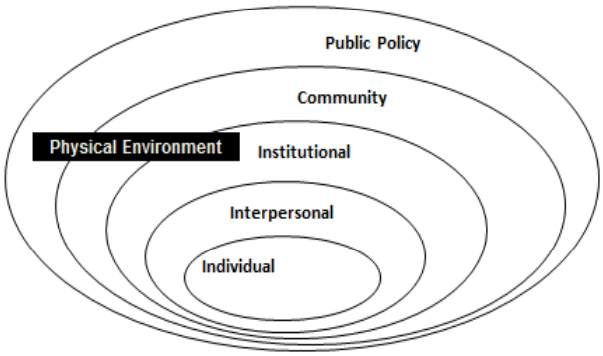
4. Can we develop successful interventions and policies to promote PA in older populations, and, if so, what are the criteria on which to evaluate their success? (Prohaska, et al., 2006)

Can we develop successful interventions and policies to promote arts programming in older populations, and, if so, what are the criteria on which to evaluate their success?

All of the answers to these questions relate to cost & cost-effectiveness



Ecologic Model of Healthy Aging



Modified/ Sources: McLeroy et al., 1988, *Health Educ Q*; Sallis et al., 1998, *Am J Prev Med*

Difficulties in the Transition: Research to Practice & Practice to Research

The transition of scientifically tested research finding to community-based health promotion programs is often slow, fragmented, and subject to speculation by the practitioner community.

The "lessons learned " from practitioners who develop and administer health promotion intervention programs for the benefit of their communities are slow to influence subsequent health behavior research (Prohaska, 2000).

Despite the health benefits shown by numerous clinical trials on health promotion intervention for older adults, there exists a lack of understanding of the needs of health care practitioners and community providers in their consideration of adopting, implementing, and maintaining these programs in their settings. (Prohaska and Etkin, 2010).

Definitions of Evidence-Based Wellness and Health Promotion Programs

- All include a therapeutic element (treatment) and a well developed strategy for implementing the treatment (program delivery).
- May be oriented toward healthy older adults as well as those with moderate to significant health conditions.
- Documented impact on meaningful health outcomes and related demographic, psycho-social and environmental correlates that influence the behaviors.
- Evidence-based wellness and health promotion programs are comprehensive, multi-faceted intervention that are based on an understanding of the mutable determinants of health and well being of older adults.
- Evidence of a systematic review and deemed an "evidence-based program"

Examples of Evidence-Based Programs

- Chronic Disease Self Management Program (CDSMP)
- EnhancedFitness
- Matter of Balance
- Fit and Strong
- Active Choices/Active Living Every Day (AC/ALED)
- Healthy IDEAS

Common Characteristics of Evidence-Based Programs for Successful Translation

1. Randomized Control Trial (RCT) and similar non-randomized trials with established efficacy and effectiveness
2. Essential elements clearly defined (and documented "implementation manuals") and opportunities for reinvention, program tailoring
3. Incorporation of the priorities and realities of community practitioners and agency directors
4. Documented cost and cost effectiveness
5. Sensitive to realities at the community and organizational level (demonstrated flexibility: settings where program delivered, level of expertise required and mode of program delivery).

Issues in Translation and Dissemination

- While evidence-based, the program requires evidence of the representativeness of the participants, environments and settings where the program will be implemented and the conditions, resources and program staff involved.
- It is often difficult to determine the overall impact of an evidence based program and the relative impact across programs

Recommendations for Evaluating Overall Impact of Evidence-Based Programs

- Use the RE-AIM framework to determine overall public health impact
  - **Reach** (number and percent of persons recruited and representativeness of targeted population)
  - **Effectiveness** (how well does the obtain outcomes comparable to the original; quality of life)
  - **Adoption** (number and range of settings where program is implemented)
  - **Implementation** (consistency and the fidelity of adherence to program essential elements (and cost and resources to do so)
  - **Maintenance** (extent to which participants continue program therapeutic elements and extent agencies/organizations continue program (beyond initial funding))

Recommendations for Reducing Cost Determining Cost Effectiveness and Enhancing Overall Impact

1. Greater Focus on Reach
2. Focus on essential Elements
3. Consider Contextual Factors within the Environment
4. Long-term Sustainability

Recommendations for Enhancing Overall Impact

5. Key Stakeholder Engagement
6. Develop Interventions with Dissemination in Mind
7. Continued Development and Refinement of Programs
8. Investigate new Modalities for Program Delivery

Cost Considerations

- Merits of "top-down" versus "bottom up" strategies for dissemination of evidence based programs.
- The pitfalls of "gold standard" evidence based programs

"If we want more evidence-based practices, we need more practice based evidence " (Green 2008).

All include a therapeutic element (treatment) and a well developed strategy for implementing the treatment (program delivery).

May be oriented toward healthy older adults as well as those with moderate to significant health conditions.

Documented impact on meaningful health outcomes and related demographic, psycho-social and environmental correlates that influence the behaviors.

Evidence-based wellness and health promotion programs are comprehensive, multi-faceted intervention that are based on an understanding of the mutable determinants of health and well being of older adults.

Evidence of a systematic review and deemed an "evidence-based program"

Conclusions

"The unfortunate state of the field in which there are relatively few, feasible, generalizable, effective and sustainable evidence based programs promoting the health for older adults will soon change. However, with the proliferation of new evidence-based programs, there needs to be a corresponding effort to improve the quality, promote the flexibility, and enhance the public health impact of these programs." (Prohaska et al. 2011).

Thank you

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Discussion of the Costs and Benefits of Arts Programs

William D. Spector, Ph.D.
Agency for Heath Care Research and Quality
Department of Health and Human Services

My Background

- LTC researcher with experience with design, implementation, and evaluation of interventions for the elderly.
  - No research credentials in arts impact on health
- Personal experience in ballroom dance.
- Amateur chamber music player and performer. Music camp participant.
- Performed with David Reuben at Brown U. Medical School event many years ago.

Introduction

- Cost-Benefit analysis to determine value to society in dollar terms
- Cost-effectiveness analysis in the real world
  - Benefits expressed in health effects
  - Costs expressed in dollars
- Topics to add to the discussion
  - For a complex art creation program what is the intervention?
    - Group Art Program (GAP)
    - Group Music Performance (GMP)
  - What benefits? For whom?
  - What costs should be included?
  - Goals?
    - Improve health
    - Reduce health care costs
    - Reduce sick days

Other Thoughts

- Program has no benefit unless offered and someone participates
- Are arts creation programs like exercise or baseball?

The Players

- Funders
  - Gov and private funding agencies
- Providers
  - ALF, nursing homes, adult day care
  - Arts, dance, and music programs for adults
- Older Adults
- Insurance companies? Wellness Programs?

Context

- For profit and nonprofit providers
- Not all costs and benefits to society are internalized by individual entities
- Consumers may get programs as part of larger menu – trade offs
- Difficult to evaluate the health effects of particular programs

Implications of Context

- Costs and benefits in context of dissemination strategy
- Some benefits are more public than private, e.g.,
  - Educating public on benefits of GAP
    - Not something an ALF likely to do
- Market based strategy
- Can consumers evaluate arts programs effect on health?

What is the Intervention?

- Example of group music performance (GAP) - Complex intervention involving teamwork
- Simple intervention-- Singing in the shower
- Complex intervention-- team of players, different roles, interactions, challenges
- Components of GAP
  - Rehearsals , practice, (coaching), and performance

Intervention Example

- Rehearsals –interaction with others, executive function, motor skills and cognitive impacts, listening to self and others, watching, orientation, concentration, rhythm, pitch, problem solving, mental flexibility, memory, concentration, improved brain plasticity.

Intervention Example

- Practice
  - Concentration, isolating, stamina, motor skills, repetition to remember and to gain speed and technique. Improved skill, some addition to memory, easier to refresh skill level.
  - Effects depends on instrument
- Performance
  - Teamwork under stress
  - Musical decision making
  - Coach facilitates and leads decision- making; redefines roles

What are the Active Ingredients

- Effect depends on cognitive and physical challenges for the individual
- Like exercise
- How do we articulate this challenge and assure it is replicated
- How dependent is the impact on particular factors?
  - Successful performance- like baseball
  - Skills of the coach
  - Social interactions

The Intervention Components

- Is education included?
  - Individual providers unlikely to develop a program
- Business case?
- Behavioral program to integrate into daily life? Facilitator? Train-the-Trainer?
- Eligibility criteria for participants and for staff/coach?
- Availability of a manual to integrate arts program into wellness /activities program?

Defining the Intervention

- Must articulate the intensity
- Time, supply commitment of participants and staff
- Goals--sight reading versus new music preparation, etc.
- Prerequisites-- physical, mental and arts skills of participants
- Minimum skills of coaches

Benefits

- Health and quality of life
- Reduction in health care costs
- Job productivity

Benefits

- May be different depending on role of the team and who is on the team
  - Ballroom dancing -- man orchestrates woman follows. Woman dances in heels backwards.
- Social interactions, joint decision making, cognitive and motor skills, and potentially anatomical brain changes.
- May differ depending on what is accomplished, e.g., sight reading versus perfecting new challenging music.

Assumptions about cost

- Slack or no slack
  - Part of job description or additional staff?
  - Cost calculation compared to what?
- Is this an add-on or will replace another program—extra costs or savings?

Costs of Intervention

- Rehearsals
  - Time including travel, scheduling
  - Supply costs, depreciation of instrument, sheet music
  - Rehearsal space costs
  - Injury risk –higher or lower?
  - Coach time commitment
- Performance
  - Marketing, advertizing, etc.
  - Space, Scheduling time
  - Time of performance
- Individual Practice
  - Rehearsal space
  - Time

Costs of Intervention (cont.)

- Is there a training manual for recreation staff?
- Organizational change --champion costs
- Facilitator to initially help set up program?
- Personal trainer to integrate into day-to-day life
- Educational materials for staff and consumers

Conclusion

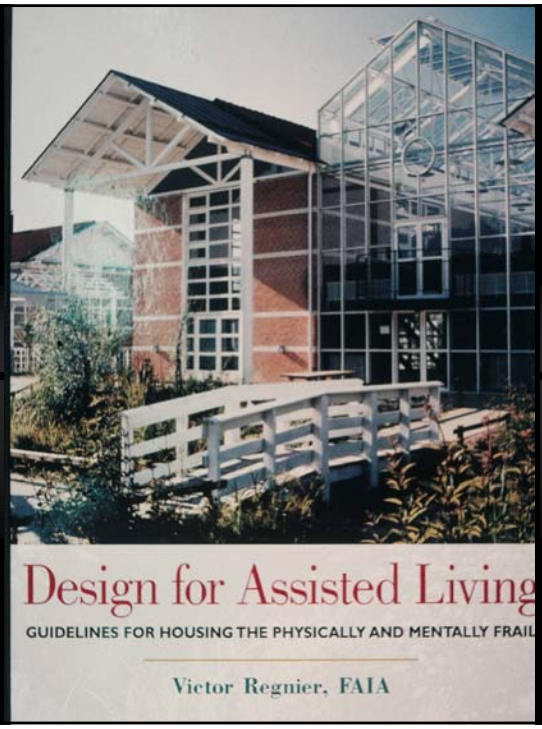
- GAP is more like baseball than exercise
- The worse players may get the most health benefit?
  - Likely to be greater more challenging relative to initial skills but can't become too frustrating or too physically difficult
  - Like exercise- how much do you push people to get the benefits and if you don't push them they don't get the benefits.
  - Think Took kit

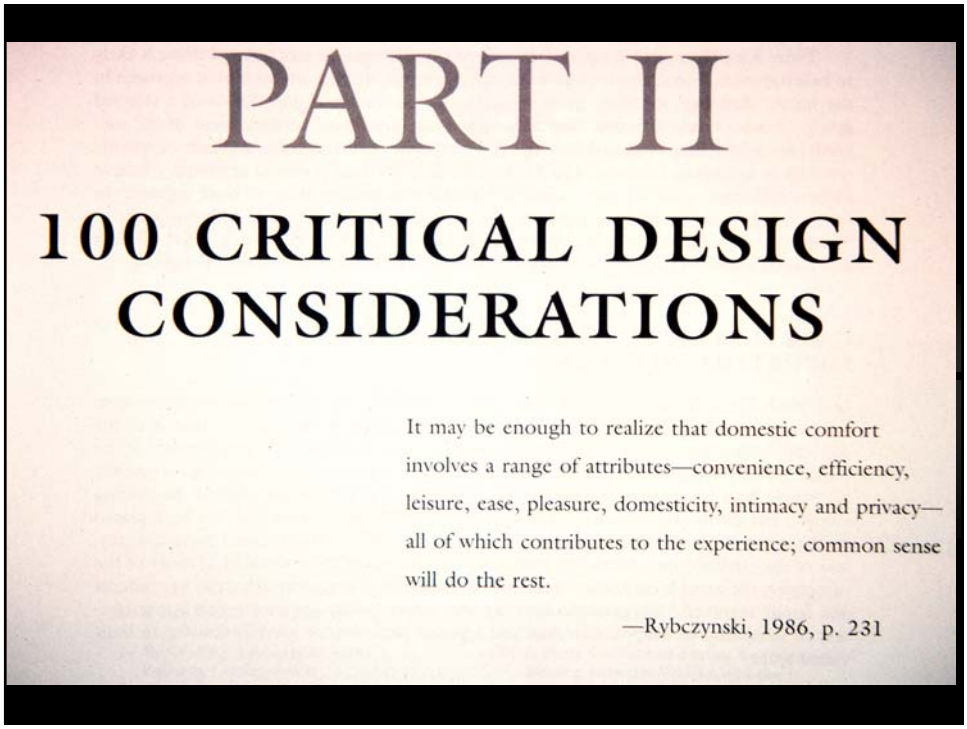
How the Design of the Assisted Living and LTC Environment Impacts the Success of Arts Programs

Workshop on Research Gaps and Opportunities for Exploring the Relationship of the Arts to Health and Well-Being in Older Adults

September 14, 2012
Washington DC

Victor Regnier FAIA
Professor of Architecture and Gerontology
University of Southern California





Six Environmental Themes

1. The Primary Pathway—linking circulation to activity
2. Previewing and Vicarious Observation
3. Rooms that Support a Range of Activities
4. Programs for Art and Activities
5. Using Artwork and Accessories to add Life to the Place
6. Using Architectural Differentiation to Increase Way-finding

ONE

The Primary Pathway—linking circulation to activity

+

The 100% Corner

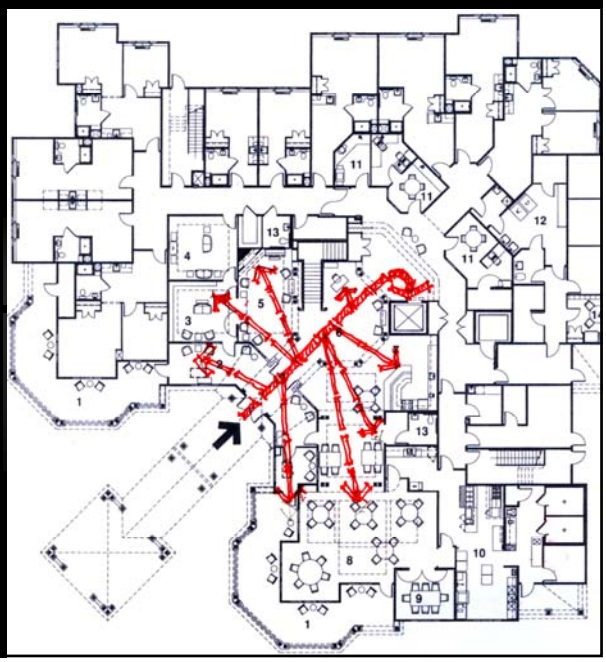
Howell's two relationship diagrams between the primary path

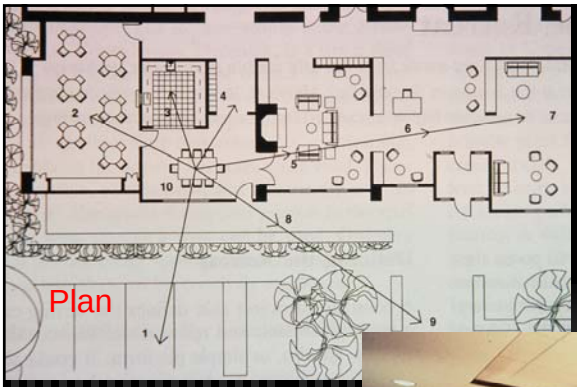
+

social spaces

Entry Stem creates EIGHT view corridors

1. 3 season porch
2. Library
3. Fireplace
4. Concierge
5. Bistro bar
6. Bistro
7. Dining room
8. Covered porch





100% Corner

NINE views from the Country Kitchen Table

^

1. Parking Lot
2. Activity Room
3. Kitchen/Food
4. Mailboxes
5. Fireplace
6. Concierge
7. Dining Room
8. Covered Porch
9. Entry Path

TWO

Previewing and Vicarious Observation

Seeing into a room before you make a commitment to enter the room….

Previewing

Window from corridor to adjacent community room

Vicarious and Unobtrusive Observation

Sitting area in atrium overlooks the floor below

Front porch overlooks the neighborhood and entry stem

Activity room connected to surrounding corridor by transparent windows

Reducing Uncertainty by viewing into a room

A+Crafts room with built-in window display for previewing

THREE

Arts rooms that support activities for many and for a few

1. Hard/Soft Flooring
2. High/Low Natural/Artificial Light levels
3. Adequate Storage and Display
4. Ventilation + Access to Outdoors
5. Accessible Equipment and Work Space

A well designed A+Crafts room should have natural light, storage areas, adjacent patio, good lighting, etc.

Arts and Crafts Room Designs

This single activity room has a carpet on one end and a hard surface floor on the other end —about 450SF

Burbank, CA

Creative Studio Spaces for Artwork and Sculpture

Silver Spring, MD

Recording Studio

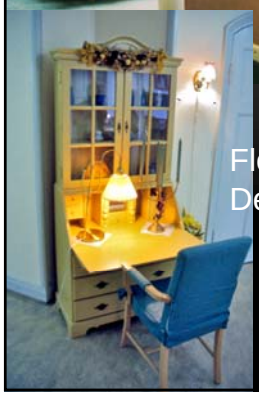
This serves TV recording and audio-recording needs

Bethesda, MD

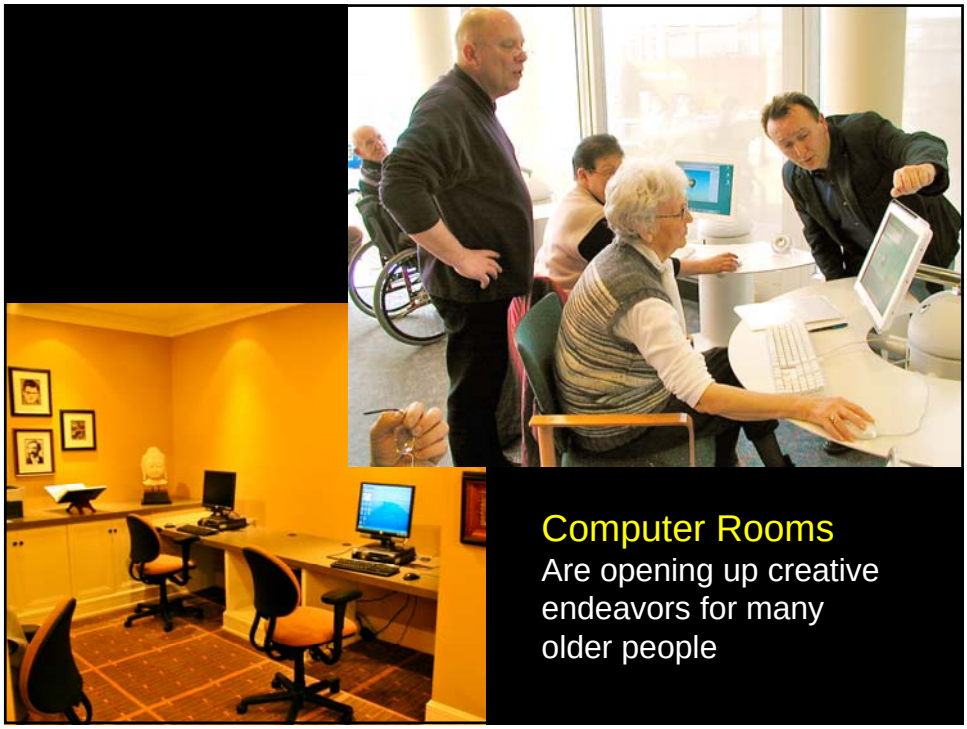
Friendly Staff Offices

that provide accessibility and privacy

Dutch Doors



Floating Desks



Computer Rooms

Are opening up creative endeavors for many older people

Snoezelen Rooms for People with Dementia

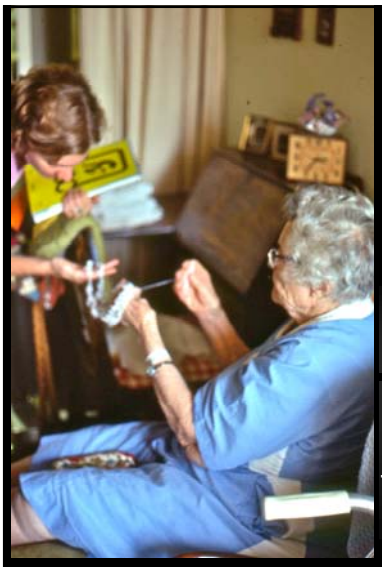
Sensory Room

Snoezelen Bathing

FOUR

Programs for Arts and Activities

Small programs for one or two are just as important as important as Large programs for a dozen.



Puzzle Making

Tatting

Programming for Single Individuals and their Interests

Weaving

Individual Programs are Often not that Hard to Offer if Equipment and Space is Available

First-time Sculpture

Staff Support and Encouragement

Staff play an extremely important role in encouraging a range of activities and artistic endeavors

FIVE

Using Artwork and Accessories to add Life to the Place

This building in Rotterdam has encouraged residents to hang their own artwork In the hallway immediately adjacent to their unit.

At the MPTVF in Woodland Hills, CA part of a residential corridor has been transformed into a gallery

Whimsy and joy can be supported by affect-laden interior art and accessories

Dementia Museum

These Showcases provide Opportunities for Triangulation

Large Showcases in this Dementia corridor can create a narrative about residents that live here.

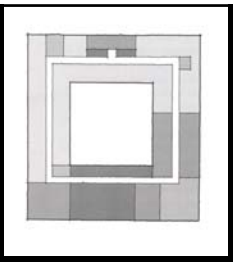
SIX

Using Architectural Differentiation to Increase Way finding

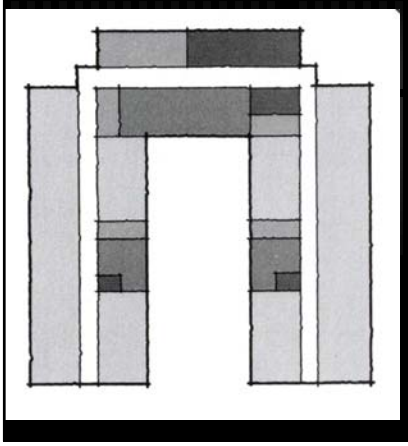
Large size unusual objects strategically placed can facilitate orientation

Dementia residents only know what they can see

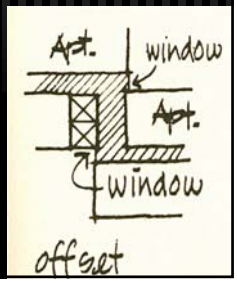
External Views Can Aide Orientation



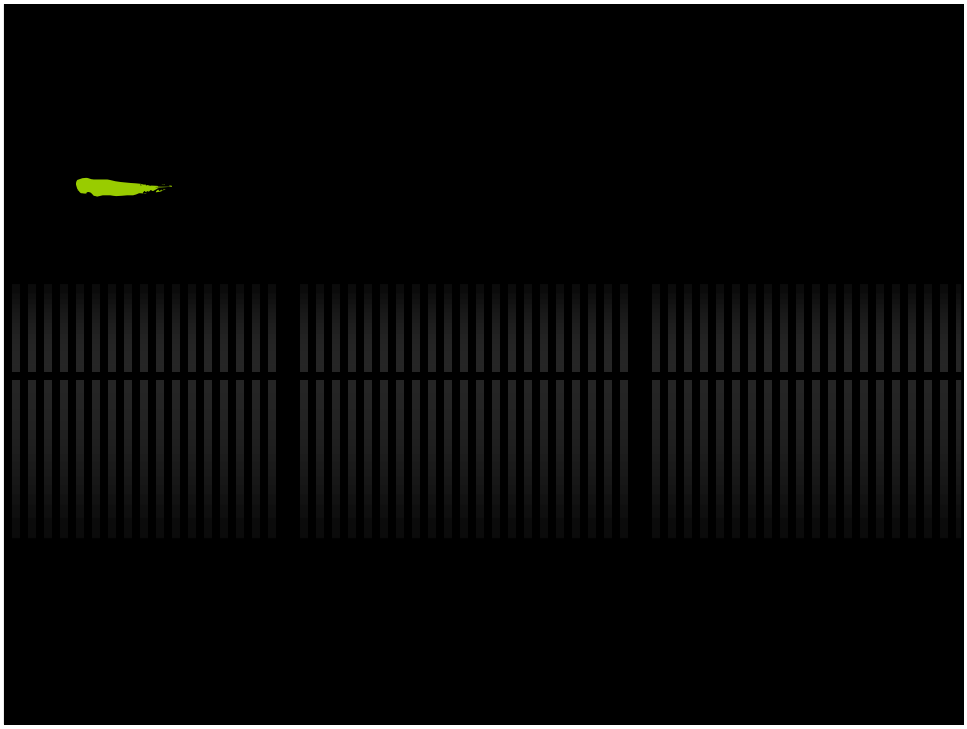
Avoid symmetrical plans without external views



External views can be established by offsetting the plan or opening a corner (or two)



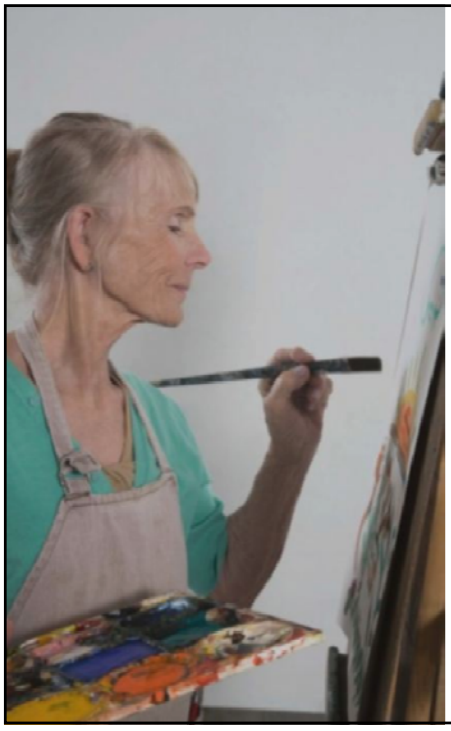
- ✓Q+A



The Role of Visual Art in Improving Quality-of-Life Related Outcomes for Older Adults

Kathy **Hathorn**, MA, EDAC
CEO, American Art Resources
Executive Director, REDCenter

NATIONAL ACADEMY OF SCIENCES



Presentation Outline

Theoretical Background of Research in Visual Art

Physical, Cognitive, Emotional Issues Effecting Perception of Art

Impact of Art and Design on the Elderly

Older Adults Viewing Art

Older Adults Making Art

Effect of Visual Art on Caregivers

Research Opportunities

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Timeline of Visual Art in Healthcare

Middle Ages-Last Chance for Redemption

1860 Florence Nightingale: *Notes for Nursing*

1930-1940 WPA Arts Projects

1980-1990 Hospitality-Based Design

1984 Ulrich: Landmark Studies

1990 Trends: Interest in Therapeutic Environments

2003+ Evidence Based Design

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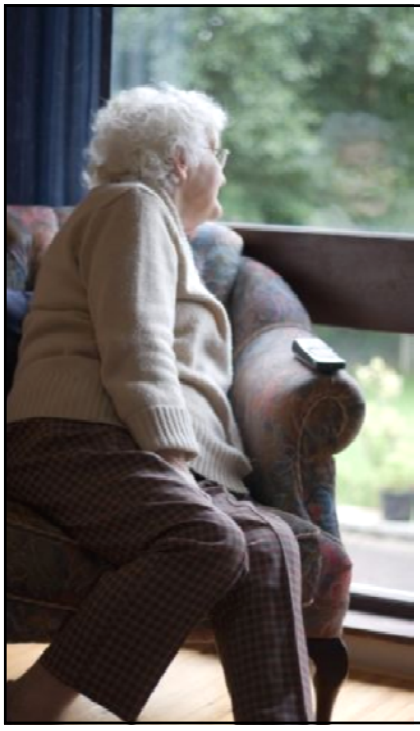

Theoretical Background of Research in Visual Art

- *Prospect and Refuge Theory*:

  The ability to see and the ability to hide are key to our survival. Unimpeded opportunity to see is a prospect, and to hide is a refuge.
  (Appleton, 1975)

- *Emotional Congruence Theory*:

  Our emotional states bias our perception of environmental stimuli in ways that are congruent or match our feelings.
  (Bower, 1980)

- *Biophilia Theory:*

  Millions of years of evolution have left humans to be partly hardwired, or genetically prone, to respond positively to nature settings that fostered well-being and survival for early humans.
  (Wilson, 1984)

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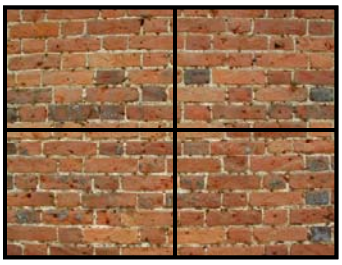
Theoretical Background of Research in Visual Art-Early Studies



VS.

Landmark Study – Foundation of EBD

- Analyzed 9 years of discharge records
- Reduced stays: 7.96 days compared to 8.70 days
- Fewer strong analgesics needed
- Fewer notes from nursing staff
- Laid foundation for "art imitates nature"

Ulrich, 1984

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Theoretical Background of Research in Visual Art-Early Studies

Hypothesis:

The *arousing* pictures might function more effectively than the serene pictures in distracting patients from their impending surgery, an effect that might lower preoperative stress.

Images mounted in ceiling fluorescent grids in a pre-op holding area

Findings:

Patients viewing *non-arousing* nature had systolic blood pressure levels 10 to 15 points lower.

Coss, 1991

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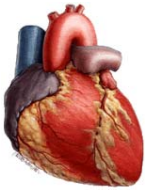
Theoretical Background of Research in Visual Art-Early Studies

Blood Pressure



Heart Rate

Skin Conductance

Coss, 1990

Heerwagen, 1990

Miller, 1992

Ulrich, 1993

Hoffman et al, 2000

Diette et al, 2003

Schneider, 2003

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Physical, Cognitive and Emotional Issues Effecting Perception of Art

Vision:

Amount of light available at retina significantly reduced

Lens sclerosis

Cataracts

Depth perception issues

Glare and shadows

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Physical, Cognitive and Emotional Issues Effecting Perception of Art

Cognitive:

- Loss of critical thinking/executive function
- Loss of sense of time and place
- Loss of communication/social skills
- Agnosia

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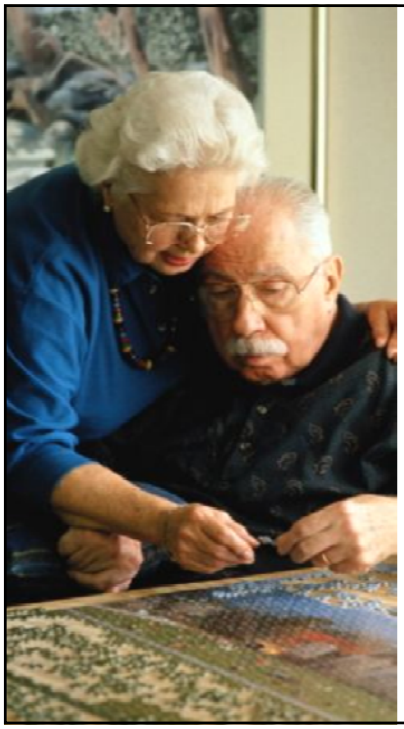

Physical, Cognitive and Emotional Issues Effecting Perception of Art

Emotional:

- 4 A's – anxiety, aggression, agitation, apathy
- Brain areas least affected by AD and other dementia

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Impact of Visual Art and Design on the Elderly

Shift in thinking in last quarter of 20th century

Nursing Home Reform Act (1987)

American Disabilities Act (1990)

Patient Protection and Affordable Care Act (PPACA)

Hospital Consumer Assessment of Healthcare Providers (HCAHPS)

Results: "Non-institutional" design

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Impact of Art and Design on the Elderly Extent of Use of Passive Visual Art

43% Display Visual Art (art on the wall)
Reasons Given:

- 80% - Benefit patients
- 70% - Contribute to a healing environment
- 58% - Help patients and families deal with serious illness
- 57% - Part of the psycho/social recovery

Source: Society of Arts in Healthcare and Joint Commission survey of 5000+ hospitals

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Impact of Art and Design on the Elderly Extent of Use of Passive Visual Art

Extrapolation:

31,100 assisted living facilities with 733,300 residents

16,100 nursing homes with1,500,000 residents

∴ 20,296 facilities for seniors have visual art, impacting 960,319 residents

Source: Centers of Disease Control and Prevention (2010)

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Impact of Visual Art and Design on the Elderly An Urgent and Compelling Reason to Know More!

Martin Bayne, a young-onset Parkinson's disease patient living in an assisted living facility, poignantly explains, "Most residents show a calm, even veneer. But beneath the surface, all of us are susceptible to the ambient despair that is a permanent component of life in assisted living. It's the result of months or years of loneliness and isolation. It's also the result of burying our feelings and emotions about being surrounded by many demented and disabled neighbors and frequent death."

Source: A Room With A Grim View: The 'Ambient Despair' That Marks Life In Assisted Living
Health Affairs, 31, no.7 (2012):1633-1635

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Viewing Art
So What Do We Know?

Brain plasticity can continue well into old age

Art utilizes both hemispheres of the brain

"Chocolate to the brain" Cohen

Stimulates emotional functions

Way of engaging older viewers

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Viewing Art
So What Do We Know?

- A number of museum programs worldwide
- Museum of Modern Art "Artists for Alzheimer's" (ARTZ) program

  Director reports:

  Opportunity for personal growth and new insight

  Access long-term memories

  Make connections between individual experience and world at large
- New York University School of Medicine found:

  Reduction in depression

  Improvement in socializing

  Reported higher self-esteem

Zeisel (2009), Smith (2010)

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Viewing Art
So What Do We Know?

A Social Interaction Study in Sweden

- Discussion about painting vs. general topics
- Higher degree of social interaction
- Desire for interaction with family and friends
- Dialogs became more experience and knowledge-based
- Characterized by “imagination and happiness” vs. “downheartedness”
- Life situation perceived as better

Wikstrom (2002)

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Viewing Art
So What Do We Know?

Pilot Study Conducted in Five Midwestern Nursing Homes

- Can nature elements improve the bathing experience?
- Included pictures and sounds of birds
- Outcomes:
  - Decreased agitation and aggression
  - More positive affective response

Whall et al (1997)

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Making Art
So What Do We Know?

Significance and Effectiveness of Expressive Art Activities

- Helping individuals relax
- Providing a sense of control
- Reducing depression and anxiety
- Encouraging playfulness and a sense of humor
- Improving cognition
- Offering sensory stimulation
- Fostering a stronger sense of identity
- Increasing self-esteem
- Nurturing spirituality and reducing boredom

Cohen (2009)

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Making Art
So What Do We Know?

Three Artists with Alzheimer's:

- William Utermohlen
- Carolus Horn
- Willem deKooning
- Wisdom and integrity vs. longing and despair (Erickson)

Musella and Fasanaro (2011)

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Making Art
So What Do We Know?

William Utermohlen

Self Portraits 1996-1999 – died in 2007

Musella and Fasanaro (2011)

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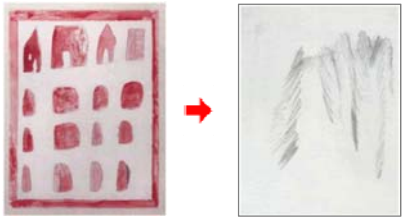
Making Art
So What Do We Know?

Carolus Horn



Died in 1992

Musella and Fasanaro (2011)

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Making Art
So What Do We Know?

Willem de Kooning

Died in 1997

Musella and Fasanaro (2011)

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Effects of Art on Caregivers

Growing trend in medical schools of incorporating the arts

Staff reports of visual art programs reducing stress

Staff reports of value of making art in workplace

Staff reports of being more compassionate and providing higher quality of care

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Research Opportunities
Visual Art

More known about participatory art programs-viewing/making

Very little known about viewing art in an unstructured environment

Burning question:

What happens when the art "does night duty"?

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Research Opportunities
Visual Art

We simply have NO idea!

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Research | Education | Design

Institute for Human Centered Design

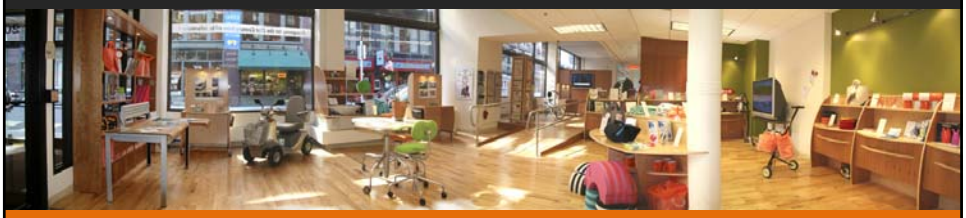
Respondent

The relationship of aesthetics and design factors to health & health quality related outcomes of older adults

Valerie Fletcher
IHCD Executive Director

Institute for Human Centered Design

An international design non-profit dedicated to enhancing the experiences of people of all ages and abilities through excellence in design.



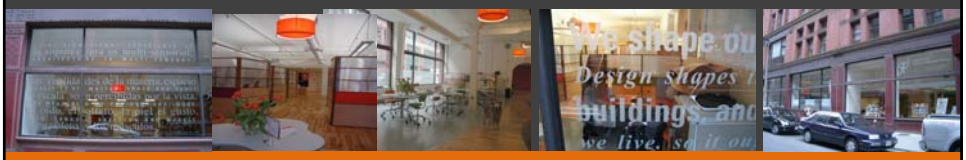
www.HumanCenteredDesign.org

"Design is the way we decide how we want things to be."

- Richard Simmons

"Design is a social art"

- Ray Lifshez

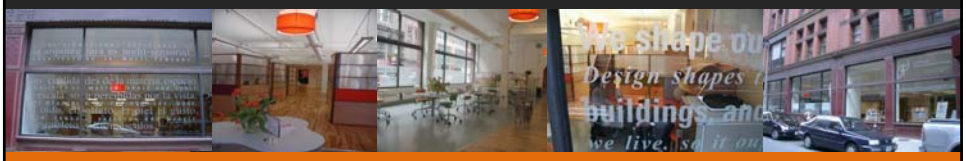


www.HumanCenteredDesign.org

Design powerfully and profoundly influences everyone and our sense of **confidence**, **comfort**, and **control**.

2 core ideas…

Variation in ability is ordinary, not special, and affects most of us for at least part of our lives.



www.HumanCenteredDesign.org

First, some definitions…

Accessibility/Barrier-Free in Relation to UD

- Legal mandates – in law or building code - are limited to specific types of places and set minimum requirements focused on specific users, especially people who use wheeled mobility.
- UD is a framework for rethinking *all* environments, products, information and communications for the widest possible spectrum of potential users.
- UD/Design-for-All builds from a baseline of accessible design.
- UD is an evolving knowledge base of best practices rather than fixed standards ----- **It's about design**.

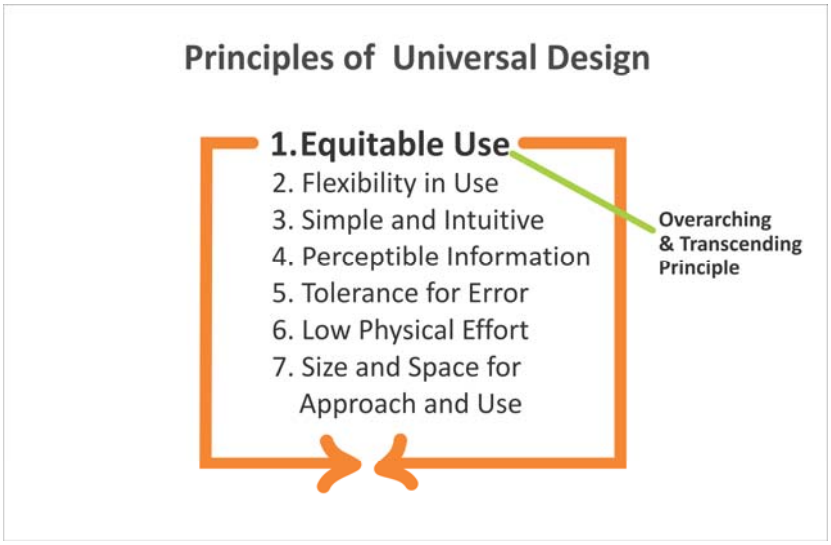
Institute for Human Centered Design

What is *universal design… inclusive design… design-for-all*?

*…a **framework** for the design of places, things, information, communication and policy that focuses on the user, on the widest range of people operating in the widest range of situations without special or separate design…*

or

Human centered design (of everything) with everyone in mind



User/Experts

- People at the edges of the spectrum of ability and age are especially attuned to knowing when design fails *but also* to what works.
- Observing user/experts in natural settings delivers substantive information and insight
- User/Experts are fuel for insight and inspiration – ***help you to generate theories not just see problems***

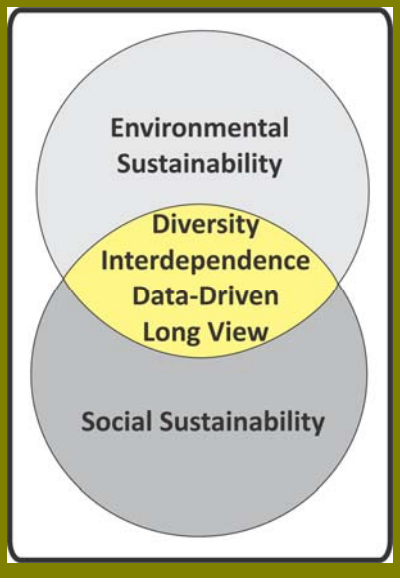
Extraordinary 21st Century demographics powerfully shape our professional and personal future

The 20th century impetus to Social Sustainability

Profound *POSITIVE* impact of human behavior. . .

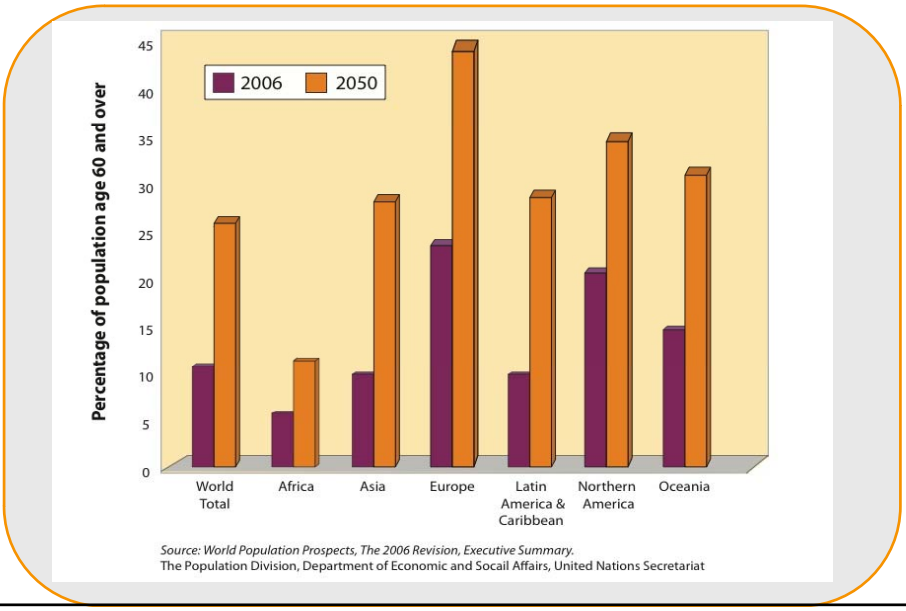
We live longer & survive more - across the globe

shared values/concepts . . .



Global Aging

Percentage Increase in Age 60 + by Region, 2000-2050



Source: World Population Prospects, The 2006 Revision, Executive Summary.
The Population Division, Department of Economic and Socail Affairs, United Nations Secretariat

3 broad categories of functional limitation:

Physical	Sensory	Brain-based
Mobility	Sight	Learning
Dexterity	Hearing	Developmental
Strength	Speech	Mental health
Stamina	Touch	Cognitive
	Proprioception	Brain injury or trauma

Global policies respond to the new reality

United Nations
Programme on Ageing

towards a society for all ages

Madrid International Plan of Action on Ageing (2002)

Priority Direction:

Ensuring enabling and supporting environments

World Health Organization

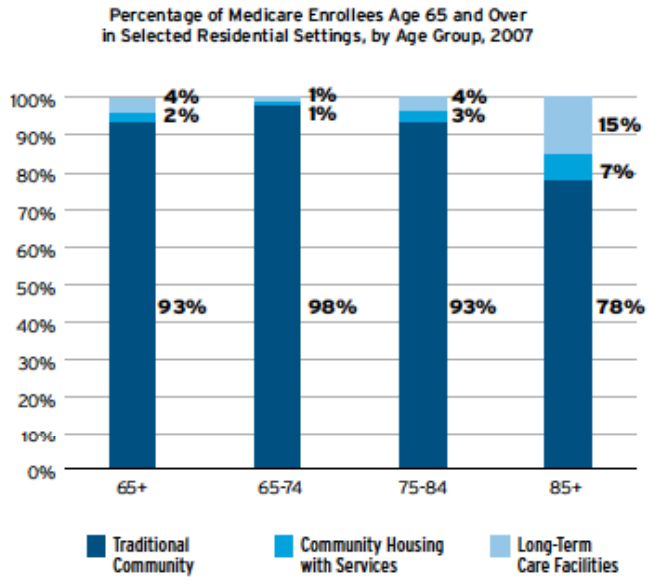
ICF

Redefined disability in 2001

- Functional limitation, a universal human experience
- Equalized mental and physical reasons
- Defined disability as a ***contextual*** variable
- Functional limitation = disabling ***if*** context is a barrier:
  - ✓ *Physical* environment
  - ✓ *Communication* environment
  - ✓ *Information* environment
  - ✓ *Policy* environments
  - ✓ *Social* environments

Neither incremental strategies nor "special" solutions will be enough.

- No time
- Little money



Last thoughts

- Universal Design is a way of thinking about human diversity today and the power of design.
- Functional limitation is a fact; disability is contextual
- Engaging 'User-experts'helps to generate theories not just see problems
- Too little research on the human impacts of design.

Institute for Human-Centered Design
[Adaptive Environments]

Institute for Human Centered Design

Discussion:
The Relationship of Arts to Health and Well-Being in Older Adults: Research Gaps and Opportunities

NAS September 14, 2012

Margie E. Lachman, Ph.D.

Psychology Department
Lifespan Development Lab, Brandeis University
http://www.brandeis.edu/projects/lifespan/

Overview

- Linking Behaviors to Healthy Aging
- Possible Mechanisms Linking Art and Health
- What Designs for What Questions
- Adaptation to Aging
- Prospect and Promise for Art and Older Adults

Linking Behaviors to Healthy Aging

What can we do to slow aging or minimize declines or enhance quality of life?

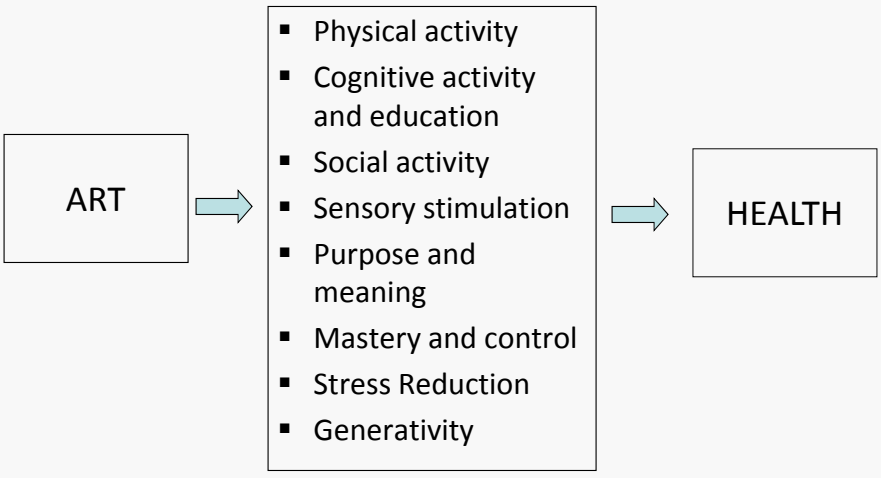
Observational and anecdotal information in many domains

Examples:

- **Education**
- **Cognitive Stimulation**- cross word puzzles, brain games
- **Physical Activity**- intensity, duration, frequency
- **Social Engagement**- loneliness, social interaction

Lifespan Developmental Psychology Lab

Possible Mechanisms



Lifespan Developmental Psychology Lab

Different Designs for Different Questions

- Experimental
  - Randomized Controlled Trial and Interventions
- Developmental and Quasi Experimental
  - Longitudinal and Cross-sectional
  - ABAB Reversal Design
- Daily Diary, Experience Sampling

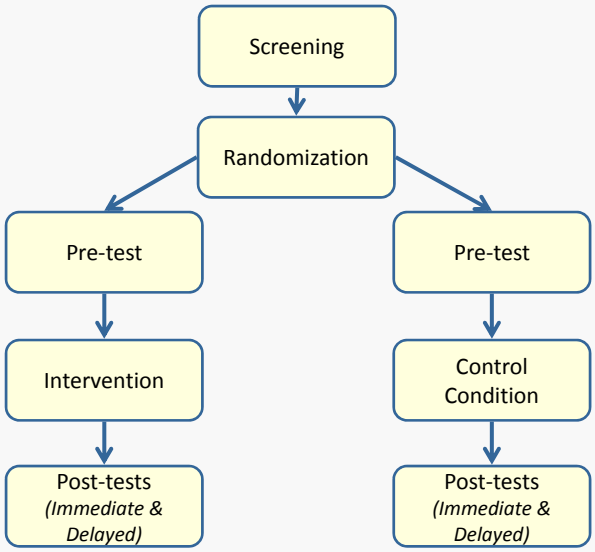
Lifespan Developmental Psychology Lab

Experimental Designs

- Is art more effective than other behaviors or treatments?
- What is it about art that is effective?- Vary conditions and control groups (alone vs. in groups, participation vs. observation, moderate physical activity vs. light physical activity)
- Choice vs. assignment to art- yoked design
- Maintenance and transfer
- Selection- who participates?
- Person by treatment effects- Who benefits the most from which programs?

Lifespan Developmental Psychology Lab

Randomized Controlled Trial (RCT)



Developmental and Quasi Experimental Designs

- Long term effects of art- longitudinal or retrospective
- Does art affect the aging process, e.g., reduce or slow declines?
- Is art better for older than younger adults (cross-sectional or longitudinal)?
- Individual Differences in preferences and benefits of art- personality, culture

Longitudinal Design

Age:

10

30

Compare those who engage in art with those who don't over time

50

70

Time


1629 (23)


1640


1652


1659

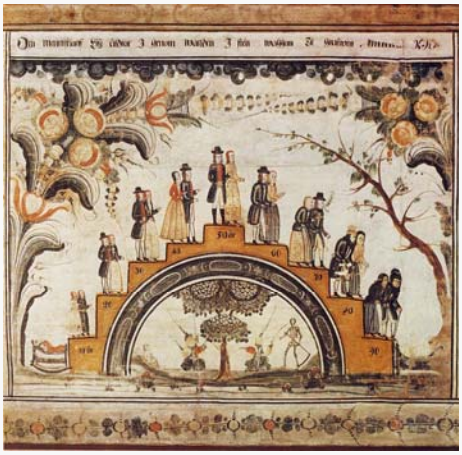

1669 (63)

Rembrandt (1606-1669): Self-portraits
Source: ARTSTOR

Cross-sectional Design

Age Group: **10** **30** **50** **70**

Effects of art at different ages

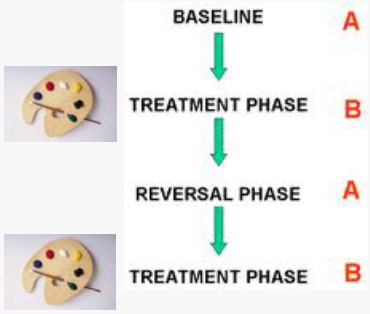


Winter Carl Hansson,Sweden, Steps of life, 1799
Source: http://commons.wikimedia.org

The A-B-A-B Reversal Design

- When give art treatment does it make a difference and do effects go away when treatment removed

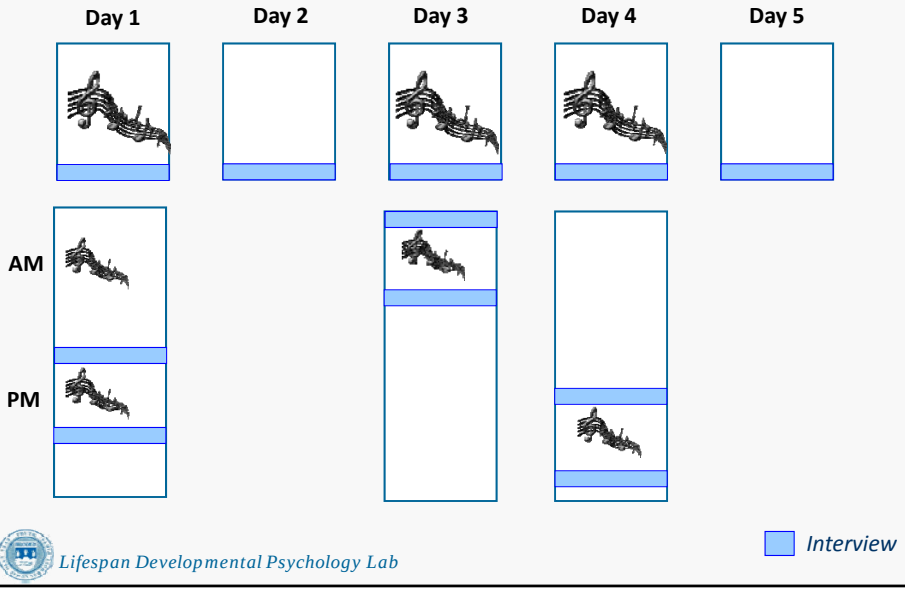
The A-B-A-B Reversal Design



Daily Diary and Experience Sampling

- Natural settings
- Within person design
- On a days when doing art are you happier?
- At times of the day when doing art are you better off- blood pressure, heart rate, cortisol, less stress, less anxious, in a better mood?

Daily Diary Design and Experience Sampling



Multiple Outcomes

- Physical Health
  - Chronic conditions, functional health, blood pressure, heart rate, cortisol, inflammation
- Psychological Well-being
  - Happiness, positive mood, depression, purpose and meaning, sense of control and mastery
- Cognition and Memory
- Longevity
- Social Engagement
- Sensory Abilities

Prospect and Promise of Art

- Learning something new
  - Plasticity
  - Mastery
  - Enjoyment
- Lifelong engagement
  - Long-term benefits
  - Adaptation and aging, Flexibility

Prospect and Promise of Art

Adaptation and Aging:
Selective Optimization with Compensation (SOC)
(Baltes and Baltes, 1980)

- **S**election- Focus of goals
- **O**ptimization- Means to achieve goals
- **C**ompensation- Maintaining goals in the face of losses

Arthur Rubinstein
Source: http://www.pianocareer.com

Prospect and Promise of Art

- Prevention, Enrichment - Optimize lifespan development
- Remediation, Therapeutic-
  - Dementia, Parkinson's Disease
- Quality of life and health
- Selling point for Senior Housing-
  CCRC's, long-term care,assisted living
- Evidence- based policies
- Translational research
- Training in lifespan development and aging