Music, Imagery, and Movement (MiM): A Treatment Intervention Study Examining the Effects of MiM on Emotional and Cognitive Functioning of Residents in Long-term Care

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Older Adults

• The 2010 Census indicates 18% of the population, or 55 million Americans, are aged 60 or older. Census projections estimate that by 2040, a quarter of the population will be aged 60 or older.
Aging and Dementia

• Within the 65 and older population there has been a rapid increase in dementia-related disease.

• Prince et al estimate that approximately 35.6 million people lived with dementia across the world in 2010. These numbers are expected to **double every 20 years** through 2050.

• The most prominent type of dementia is Alzheimer’s disease.

• Alzheimer’s disease makes up **55 percent** of the diagnosed cases of dementia. 5 million people aged 65 and older have Alzheimer’s disease in the U.S.; up to 16 million people will have Alzheimer’s disease in 2050. In 2010, 130,000 Virginia residents suffered from Alzheimer’s disease with a projected increase to 160,000 by 2025.
Decline in Cognitive Functioning

• Implications for emotional regulation later in life – need to employ more efficient strategies/recruit different control systems to support emotional regulation when cognitive control (PFC neural network function) declines.
Neurocognitive Theories for Populations with Limited Executive Functioning

• Impulsive system (amygdala, nucleus accumbens) involuntary, cognitively unconscious, automatic;

• 2) Reflective system (prefrontal cortex) memory, attention, cognitive control, judgment) (Bechara, 2005)
Brain Response

- Executive functioning operations (e.g., planning, response inhibition, etc.) are “slow, controlled, effortful, and based on symbolic representations and operations that must be maintained within working memory”.

- Treatment: develop and expand the repertoire of symbolic (implicit/sensory based) representations to strengthen the reflective system & improve cognitive and emotional fx
Creative Arts as Alternative Regulatory Strategies

- Control processes help to suppress behaviors associated with emotional reactivity. Neurocognitive mechanisms of emotional control: interactions between PFC and subcortical regions important.
- Similar to language, music, art, and dance are symbolic systems that can be marshaled in the service of regulating emotion and behavior.
Arts to Restore Regulation Capacity When Language Declines

• When language, as a symbolic system degrades in functioning; can expand the repertoire and accessibility to these other symbolic systems to promote emotional/behavioral regulation (Winsler, Ducenne, & Koury, 2011).

• Music in the form of song-as-instruction has been used with populations who have limited executive functioning skills.
Clinical populations with limited executive functioning capacity (planning, judgment, decision-making), and with concomitant need for enhanced emotional-regulation capacity:

Interventions that promote bilateral (horizontal) and top-down (vertical) integration and strengthen connectivity in these critical pathways.
Video

- Alive Inside: Henry
• Purpose, meaning, social connection, mastery experiences

• Facilitates communication and emotional expression and affect regulation
Arts in Health Care Settings

• Expressive arts therapies help improve sleep, increase **impulse control**, increase **concentration**, decrease depression/anxiety.

• Arts programs have been found to reduce length of hospital stay; decrease need for pain medication (Staricoff & Clift, 2011).
Reminiscence

Gregory (2011) reminiscence-based poetry intervention where poets met with older adult residents with dementia and helped the older adults transform their conversations into poems.

• **Preserve memories**
• **Facilitated communication** with others
• **Humanized** the dementia experience.
• **Decreased depression** (Bohlmeijer, Valenkamp, Westerhof, Smit, & Cuijpers, 2005)
Music

- Stuckey and Nobel’s (2010) literature review of creative arts interventions found music engagement:
  - Decreased anxiety, tension and pain
  - Increased immune system functioning in clinical populations
Music

• Music used therapeutically in institutionalized settings such as hospitals increases patients’ sense of control, reduces stress and controls pain (Chlan et al, 2013; Hartling, 2013)

• Individualized piano and jazz instruction have been shown to strengthen a range of cognitive abilities and improve balance in older adults (Alpert et al., 2009; Bugos, Perlstein, McCrae, Brophy, & Bedenbaugh, 2007).

• Chorale group participation has been shown to decrease falls (Cohen, Perlstein, Chapline, Kelly, Firth, & Simmens, 2006), decrease medication use and improve general health
Music

• A participatory music intervention for older adults with dementia helped increase resident **behavioral engagement** over time, as compared to a reading control group (Harrison, Cooke, Moyle, Shum, & Murfield, 2010).

• Thaut and colleagues (2009) employed a music therapy intervention for patients with brain injuries, with results showing **improved cognitive functioning and decreased depression and anxiety**.
Music

• Musical training can produce life-long benefits, preserving auditory neural precision that decreases the risk for subcortical auditory processing decline and, thus, stabilizing speech production despite natural aging (Parbery-Clark, Anderson, Hittner, & Kraus, 2012a).

• Musical training has been associated with improved verbal memory, spatial skills, attention, and executive functioning (Bialystok & DePape, 2009; Ho, Cheung, & Chan, 2003).
Visual Arts

- Art and imagery experiences enhance **attention, memory and concentration** in populations with limited executive functioning capacity (Guetin et al., 2009). Kinney and Rentz (2005) found drawing and painting increased well-being, **reducing sadness**, among adults with dementia in a day center, as compared to a social control routine activities group. Improvement in **cognitive functioning** has been found in adult populations with Alzheimer’s disease after participating in structured art therapy activities (Alders & Levine-Madori, 2010; Levine-Madori, 2009). Also see Fraser and al Sayah (2011) review.
As one program administrator noted, it’s amazing how “picking up the paint brushes can help in putting down the meds.”
Movement

Ideas, thoughts, feelings can be expressed in movement:

• **Decrease stress** and increase **cognitive functioning**
• **Improve ambulation** in clinical populations (Stuckey & Nobel, 2010).

Older adult women engaged in dance movement therapy five times per week experienced:

• **Decreased stress** associated with moving into a retirement community by **enhancing social engagement** (ages 78-92) (Kluge et al., 2012).

Adults with Parkinson’s disease improved in **balance and stability** after participating in a 12-week ballet intervention (Houston & McGill, 2013).
Summary of Music Benefits

- Interactive/participatory music experiences that are derived from resident-specific musical selections and paired with clapping, singing, or active engagement, have a significant effect on emotional well-being and stress in patients with dementia (Sakamoto, Ando, & Tsutou, 2013)
Call for New Tx Developments

Need for treatments that facilitate cognitive-affective integration for effective behavioral decision-making in context of long-term supportive relationships; specifically focus on strengthening emotional regulation.
MiM: Music, Imagery & Movement

- *Listening to Music* (personalized music selection)
- *Imagery Activation* (guided imagery and visual expression)
- *Body Movement* (act out movements while music is played again)
- Sharing with others
- Group story related to MiM and narration experience
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<tr>
<th>Session</th>
<th>1 - Listening to Music</th>
<th>Passive Listening</th>
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<tr>
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<td>2 – Imagery Activation</td>
<td>Mental Imagery + Visual Expression</td>
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<td>3 – Body Movement + Music</td>
<td>Moving to the Music</td>
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<td>4 – Sharing Experience with Others</td>
<td>Verbally Sharing</td>
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<td>5 – Group Theme/Summary</td>
<td>Facilitator Pulls Group Themes</td>
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MiM Treatment → Emotional Regulation + Cog fx → Behavior Δ
Neurocognitive processes

- Down-Regulation
- Up-Regulation

Neurocognitive outcome

- limbic system

Treatment Mediator

- Emot regulation
- Judgment
Pilot Study

• Research Objective
• To implement a community-based integrated music, imagery and movement intervention to improve mood and promote cognitive functioning in older adult residents living in a long-term care facility.
Hypotheses

• *Hypothesis 1*: Residents who participate in the MiM group will improve in *emotional* functioning, as compared to residents in the control group.

• *Hypothesis 2*: Residents who participate in the MiM group will improve in *cognitive* functioning, as compared to residents in the control group.
Two-group pre-post experimental treatment intervention design with 6-week follow-up (N=60)

• Random assignment to group conditions (MiM versus Sc)

• Clinician training and fidelity measures administered for both treatment conditions
# Pilot Study: Sample Assignment

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<tr>
<th>Cohort 10 weeks</th>
<th>MiM</th>
<th>Social Control</th>
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<tr>
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Sample

- Residents will be included in the study if they have a cognitive functioning score between 24-30 on the MMSE. Residents will be excluded from study participation if there is the presence of a co-morbid mental health diagnosis or other physical or behavioral challenges that clinical staff assess as rendering the resident unable or unsafe to participate in the activity. Eligible residents will be randomly selected from the unit population of residents and randomly assigned to participate in the two activity conditions (MiM or Social Control).
Outcomes

• **Emotional Functioning**
  Geriatric Depression Scale (GDS, short form)
  Profile of Mood States (POMS2-A short)

• **Cognitive Functioning**
  Mini-Mental State Exam
  Mini-Cog Assessment Instrument for Dementia
  The Minimum Data Set (MDS) – version 3.0
Process Evaluation

• Focus groups and/or individual semi-structured interviews will be conducted with participating residents to understand resident experiences of group participation and their perception of the role of the creative arts in their care at Birmingham Green

• Observational assessments will be made at three different group sessions (one in weeks 1-3; one in weeks 4-6; and one in weeks 7-10)