The Unforgettable Joy of Making Music

Nancy Gustafson, *Artist-in-Residence, Bienen School of Music;*
Founder and Executive Director, Songs by Heart
Jenny Cook, *Board-Certified Music Therapist, Songs by Heart*
Emily Becker, *Director of Operations, Songs by Heart*

I. Introduction - Nancy Gustafson

   A. Who is Songs by Heart?

   B. How was Songs by Heart created?

II. Benefits of Singing for People with Dementia and Their Families and Caregivers

   A. Benefits of Singing for People with Dementia

      1. Singing familiar songs elicits spontaneous speech production, recall and sharing of past memories, and increased socialization

      2. Ability to sing familiar songs is preserved

   B. Benefits of Group Singing for People Living with Dementia and Their Spouses

      1. Group singing is accessible and provides opportunities for collaboration

      2. Thoughtful facilitation from staff promotes opportunities for active participation

      3. Benefits extended to the relationship

   C. Benefits of Group Singing for People Living with Dementia and Their Caregivers

      1. Social inclusion and support

      2. A shared experience

      3. Relationship benefits

      4. Memory benefits

      5. Mood elevation

      6. Acceptance

D. Benefits of Group Singing for People Living with Dementia

1. Cost-effective
2. Improves Quality of Life markers
3. Benefits extend to staff
4. Supports shifting health practice toward holistic care

III. Major Brain Regions Used in Singing

A. Frontal Lobe

1. Dancing, clapping, movement to music
2. Focusing on musical tasks

B. Temporal Lobe

1. Musical memories
2. Emotional response to music
3. Processing and integrating musical sounds and vibrations
4. Processing sung words

C. Parietal Lobe

1. Processing and integrating vibrations
2. Processing sung words

D. Occipital Lobe

1. Processing visuals such as facial expression during singing and movement

E. Cerebellum

1. Dancing
2. Playing instruments
3. Complex movement

F. Brainstem

1. Heart rate changes based on rhythm and tempo

2. Changes in respiration
3. Changes in blood pressure

IV. Neuroplasticity

A. What is neuroplasticity?

1. Development of new neural connections and pruning of connections
2. Continues throughout lifespan
    a) Lack of communication between synapses can lead to cell death

B. Neuroplasticity and Rhythm

1. Breathing, heart rate, and other physiological factors can synchronize to music
2. Hebbian Principle
    a) “Neurons that fire together wire together” (Stegemöller, 2014)

C. Neuroplasticity and Auditory Signal

1. Noise has negative impact on neuroplasticity
2. Music provides a clear auditory signal
3. This can extend to sung rather than spoken words

V. Songs by Heart: Adapting Techniques for People Living with Dementia

A. Song selection

1. Listening to preferred music stimulates dopamine production
2. Most accessible songs are from the earliest decades of life

B. Movement and Music

1. BDNF
    a) A growth factor that supports synaptic and neural health
    b) Movement and music have been shown to increase BDNF in the brain

2. Based on the Hebbian Principle, pairing a task such as music prompts synchronization of multiple areas of the brain

C. Singing solos

1. Based on a neurologic music therapy technique, MUSTIM
2. Familiar songs are sung and participants fill in missing words
3. Prompts spontaneous speech production

D. Iso-Principle

1. Matching music to participant's emotional needs
2. Gradual change in the direction of desired outcome

E. Rhythm and Tempo

1. In cases of stress, the amygdala shuts down access to the prefrontal cortex
2. Rhythm and temp can be used to down-regulate (decrease excitability) of the sympathetic nervous system and to up-regulate (increase excitability) of parasympathetic nervous system

F. Mirroring

1. Can extend to body language, gestures, vocal inflection
2. Encourages active participation
3. Strengthens collaboration
4. Promotes synchrony between group members

G. Sensory Stimulation and Regulation

1. Proprioception
2. Vestibular System
3. Tactile
4. Vibro-tactile
5. Visual
6. Auditory

VI. Songs by Heart Research Projects

A. 2015 Pilot Project with Chicago Area Presbyterian Homes

1. Songs by Heart programming provided 5 days per week for 3 months
    a) Memory Care and Assisted Living (separate programs)
    b) 3 Presbyterian Home communities
2. Rough date recorded by community staff
3. Focus on quality of life and program efficacy
4. OQOLD measurement system
    a) Observing Quality of Life in Dementia

B. 2016 Study

1. Songs by Heart programming provided 5 days per week for 10 weeks
    a) Silverado Assisted Living in Highland Park (exculsively Memory Care community)
2. Data collected via video recording and in-person observation by a social worker
3. Focus on Quaity of Life, especially social engagement and group participation

C. 2020 Study

1. Songs by Heart programming provided 7 days per week for 30 days
    a) Memory Care groups
    b) 2 Chicago Methodist Senior Services communities
2. Data collected via video recording, cognitive testing, and observational reports by musicians and community staff
    a) Medication and lifestyle data (collected regularly by the communities) also taken into account
3. Focus on cognitive and social changes

VII. References

A. Brattico, E., Bonetti, L., Ferretti, G., Vuust, P., & Matrone, C. (2021). Putting cells in motion: Advantages of endogenous boosting of BDNF production. Cells, 10(1), 183. https://doi.org/10.3390/cells10010183 ds

B. Chanda, M. L., & Levitin, D. J. (2013). The neurochemistry of music. Trends in Cognitive Sciences, 17(4), 179–193. https://doi.org/10.1016/j.tics.2013.02.007

C. Dassa, A., & Amir, D. (2014). The role of singing familiar songs in encouraging conversation among people with middle to late stage Alzheimer's disease. Journal of Music Therapy , 51 (2), 131-153. https://doi.org/10.1093/jmt/thu007

D. Osman, S. E., Tischler, V., & Schneider, J. (2016). 'Singing for The brain': A qualitative study exploring the health and well-being benefits of singing for people with dementia and their carers. Dementia, 15(6), 1326–1339. https://doi.org/10.1177/1471301214556291

E. Porges, S. W., & Rossetti, A. (2018). Music, music therapy and trauma. Music and Medicine, 10(3), 117. https://doi.org/10.47513/mmd.v10i3.63

F. Stegemöller, E. L. (2014). Exploring a neuroplasticity model of music therapy. Journal of Music Therapy, 51(3), 211–227. https://doi.org/10.1093/jmt/thu023

G. Thaut, C. (2016). Musical Speech Stimulation (MUSTIM) In M.H. Thaut & V. Hoemberg (Eds.), Handbook of neurologic music therapy (pp. 146-149). Oxford University Press.

H. Unadkat, S., Camic, P. M., & Vella-Burrows, T. (2016). Understanding the experience of group singing for couples where one partner has a diagnosis of dementia. The Gerontologist. https://doi.org/10.1093/geront/gnv698