Creating pathways: Why what you teach today will matter far into the future

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Abstract

This paper presents an account of current literature on the topic of music and memory, supplemented by qualitative research in the form of interviews with seniors who are living with dementia. Music is a strong memory trigger, often linked with emotion, and stored in parts of the brain that, for most people, still function after other memories have vanished. Strong, sequential aural-vocal musicianship education programs are linked to improvements in children's working memory and ability to retrieve long-term memories, as well as influencing their ability to learn language and better process other subject information. This paper suggests that using music education to give children a greater ability, inclination and aptitude for collecting musical memories across their lifetimes has the potential to increase their quality of life long into the future.

Keywords: Music education, memory, dementia, singing

Introduction

Some music sticks in our memories, often whether we like it or not. The reasons include emotional connection, practice, quality of music, associations with circumstances, deliberate memorisation and shared cultural identity. This paper presents an account of current literature on the topic of music and memory, supplemented by qualitative research in the form of interviews with seniors who are living with dementia. The use of strong music education programs, including deliberate targeting of students' surplus attention, has the potential to influence students' ability to access and use musical memories – and improve their quality of life – long after they have forgotten their teachers' names.

What makes people remember music for a lifetime?

Studies have found that music becomes associated with events in people's lives so that hearing a particular piece of music evokes memories of the event. The memories are vivid and emotional and often accompanied by imagery relating to the original episode (Baumgartner, 1992). Neuropsychologist Lutz Jäncke (2008) finds that the stored information about memory-associated music is relatively abstract, allowing recognition even when there are changes of timbre, tempo, volume or register. The music itself may not be "emotional" – for instance, a sad piece of music may be associated with memories of a happy occasion, and vice versa. Jäncke notes that music we find emotional is strongly linked to our autobiographical memories, and "thus is closely involved in forming our view about our own self" (p. 6). This link to how we see ourselves makes music a powerful memory trigger.

Andrew Ford (personal communication, April 23, 2018) in his Australian National University 2018 Coombs Creative Arts Fellowship lecture *Music and Memory*, notes that pop, more than any other kind of music, "attaches itself to other memories". He says the short, catchy and repetitious melodies, and the ubiquitous nature of pop music, mean

it "gate-crashes our lives"; we hear the same songs repeatedly and they become learned and accidentally linked to emotional events. As music teachers, incidental – or accidental – music and the quality of our students' current playlists are outside of our sphere of influence, but the key points of repetition, brevity and tunefulness in forming memories are noteworthy. Ford points out that while art music can include short, catchy and repeated motifs it generally is longer in form and is something we "have to make an appointment with" rather than an accidental part of our lives. Long works are therefore less likely to be accidentally committed to memory, while popular music tends to collect emotional links.

To help unlock some of the reasons for music becoming memorable, I conducted interviews with two seniors who are living with dementia, about their musical memories. In the first interview, Norma, 85 (a former chorister in a choir I conducted), discusses her strong memory of the New Zealand song *Pokarekare Ana*. I asked Norma why she remembered this song from her childhood. She explained:

> We did the dishes every night and [my sister] Julie did the washing up and I did the drying up, and we would sing [*Pokarekare Ana*] and the washing up was done in next to no time flat. It was a good thing! You know, it has happy connotations, I'll put it that way.

Norma's experience demonstrates the power of emotional connection and repetition/practice in embedding musical memories. In this instance, the text was in an unfamiliar language (Maori), indicating that text meaning was not significant in creating Norma's connection with this song. Melbourne University Clinical Neuropsychologist Professor Sarah Wilson (2018) reports that singing triggers the release of the feel-good chemical dopamine, so the pleasure of singing and the emotional power of bonding with her sister made Norma's chore personally rewarding.

The brain and music memories

Since Magnetic Resonance Imaging became widely available in the early 2000s, neuroscientists have been curious to see the effects of music on the brain. European researchers Jacobsen, Stelzer, Fritz, Chetelat, La Joie, and Turner (2015) used MRI to find out where healthy young people collect and store musical memories. After finding that the neurological network encoding musical memories is at least partly independent of other memory systems, they tested people living with Alzheimer's Disease, the most common form of dementia. Their research pointed to different aspects of musical memory remaining intact even when brain anatomy and cognitive functions are greatly impaired. They posited that musical memories may thus continue to be stored until the very late stages of Alzheimer's.

Wilson (2018) reports that scans of people singing, or thinking about singing, show large areas of the brain lighting up, including motor networks and networks associated with listening, planning and organising, memory, language (if singing words) and emotion. She asserts that singing augments social bonding and empathy and activates the body's reward network, which lifts mood and can improve mental health. Thus, music education which encourages development of singing has the potential to positively impact our students' aptitude for building musical memories and improve their wellbeing.

Music and memory in children

Studies have demonstrated links between music education and improvements in memory in children. Dege, Kubicek and Schwarzer (2015) in a study of 55 pre-schoolers in Germany, found that music learning influenced children's working memory, rapid retrieval from long-term memory and phonological awareness, an important building block for language. Additionally, German researchers Roden, Grube, Bongard and Kreutz (2013), found that children aged seven and eight

studying music performed better with regard to working memory and cognitive performance than did a control group studying science. They write: "Specific components of primary school children's auditory working memory can be significantly improved by a music training program over the time course of one-and-a-half years" (p. 295). Educating children to build their auditory information processing skills through singing and musicianship may thus have long-term benefits.

Music as a memory trigger

So how can music memories improve our students' lives far into the future? French researchers El Haj, Fasotti and Allain (2011) conducted research on music and memory with young adults, older adults, and patients with a clinical diagnosis of probable Alzheimer's Disease, comparing their ability to remember autobiographical events after being exposed to music of their own choosing, and after being exposed to silence. They report: "Compared to memories evoked in silence, memories evoked in the 'music' condition were found to be more specific, accompanied by more emotional content and impact on mood, and retrieved faster" (p. 238). Their work points to the phenomenon of music being able to temporarily unlock memories and some cognitive functions that people living with dementia find are otherwise inaccessible.

My qualitative research bears out their findings: my second interview was with Michael, a retired Professor of Education, now 83 and living with Alzheimer's Disease. (Michael sings in a dementia-friendly choir I conduct.) When I first asked Michael about his interest in classical music, he could not remember. However, with the findings of El Haj, Fasotti and Allain (2011) in mind, I had prepared for the interview by asking Michael's wife about songs which may have emotional connections for him. Thus, when I started to sing the jazz standard *Fly me to the moon*, Michael picked up the melody within a few bars and started to sing the tune. Almost immediately, his previous vagueness disappeared, and he was able to access detailed autobiographical memories. Michael was then able to relate how his attraction to classical music came about when, as a child, he bonded with a Conservatorium student classical pianist who boarded with his family. Like Norma, Michael experienced an emotional connection with the music. The ability of singing to facilitate (albeit temporarily) access to memories cannot be underestimated as a means of improving the sense of self and wellbeing in people who are living with dementia.

Music and wellbeing

So how does singing and playing music affect people's quality of life? The impacts of music may vary across different age groups, but there are common threads. Forrai (1988) writes:

> One effect of music is that the child becomes emotionally balanced. Songs and games have a positive effect on his emotions, they relieve tension. Listening to music … can have a calming or stimulating effect. A song can generate different moods, through which the child's emotional world becomes richer, more varied, deeper (p. 6).

Forrai also points out the benefits of self-expression for children's confidence; the social benefits of learning to sing and play musical games with other children; the development of children's memories through learning songs and actions; and the development of children's imaginations. Daykin et al. (2017) link music with reduced anxiety in young adults, enhanced mood and purpose in adults, and improvements in mental wellbeing, quality of life and coping ability in people with serious health conditions. They also find that in older people, music is effective in enhancing morale and reducing the risk of depression. The British Psychological Society (2013) reported a study by University of West London researchers Davies, Ohl and Manyande showing that four-year-olds who made music together were more than 30 times more likely to help others than their 'no music' peers, and showed improved cooperation and problem solving. For people living with dementia,

Beilharz (2017) writes that music is not a cure, but that "music is an inexpensive, chemical-free and dignified way of experiencing far-reaching results" (p. 115). From cradle to grave, singing and making music can play a strongly positive role in improving people's mental health and quality of life.

Implications for our teaching

Keeping our students' minds actively involved in music making is crucial if we are to help our students build cognition. As students become more competent in active music making, more of their attention becomes available – in other words, as they become more adept at a task, it starts to become automatic and no longer requires their full focus. Elliott (1995) writes: "Improving musicianship does not depend on the slavish repetition of isolated movements or the memorization of verbal concepts" (p. 71). Rather, he argues, improving musicianship depends on what students do with their surplus attention. They could choose to spend it on issues unrelated to musicianship; on musical problem reduction; or on musical problem finding and solving. He reports that music students who develop beyond the novice level are those who learn to use their surplus attention (and therefore, their powers of cognition, emotion, intention and memory) in progressive musical problem solving: they are constantly finding ways of improving their active music-making. Expert teachers talk of layering musicianship tasks to capture surplus attention, and using open-ended questioning to encourage students to identify problems and solve them. Aiming to use, and keep using, our students' surplus attention is one of our biggest challenges in helping build our students' cognitive resilience.

Teaching our students how to listen and to understand what they are hearing is key to building musical minds**.** Cuskelly (2008, p. 27) asserts that a sequential, continuous aural-based musicianship program not only builds musical skill, it builds intellectual function across a range of seemingly disparate activities. Wilson (2018) notes: "The complexity of singing is striking for the brain, even though, to us, it feels like a relatively easy process." So helping children to see music notation on a page and sing it in their heads, or hear a piece of music and picture its notation, helps them build robust neural pathways. The relative ease of singing – and the portability and adaptability of the human voice – brings the voice into strong contention as the ideal instrument on which to build our teaching.

Discussion

Music is a strong memory trigger, often linked with emotion, and stored in parts of the brain that, for most people, still function after other memories have vanished. Strong, sequential musicianship education programs are linked to improvements in children's working memory and ability to retrieve long-term memories, as well as influencing their ability to learn language and better process information in other subject areas. Singing and playing musical games has been shown to create greater empathy, social skills, cooperation and problem-solving in children, while the process of singing brings potential mental health benefits in all age groups. In people living with dementia, singing and making music has been shown to improve short-term ability to access brain functions, including memory and speech, and improve wellbeing.

With longitudinal studies largely unfeasible, drawing links between music education in the early years and music memories in advanced years relies on results from disparate studies. More research aimed at exploring how and why long-term music memories are created in childhood and then retrieved by healthy adults and adults with cognitive impairment is suggested in order to explore such links. The current research in these areas suggests that giving students – through strong music education programs – a greater ability, inclination and aptitude for collecting musical memories across their lifetimes has the potential to increase their quality of life far into the future.

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