The Forgotten Magic of Music

The brain, the music and the dementia

Thesis submitted in partial fulfilment of the requirements for the degree of Bachelor of Arts

Saidhbhe Emily Canning

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Kt.: 060897-4339

Thesis Advisor: Guðrún Jóhanna Hallgrímsdóttir

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Abstract

This thesis examines the importance of music and music therapy with people who are suffering with dementia and how it can assist them in day to day life in a neurological way. It has been proven on several occasions that music aids everyone in some way or another, especially those who suffer from dementia. A number of nursing homes in the Reykjavik Metropolitan area do not incorporate a form of music therapy for their residents, even though it has been proven that it aids them. This thesis will also explore the relationship between music, dementia and the brain and how they can work together.

The writer proposes that music and music therapy can assist individuals that live with dementia and that it actually affects the neurones in their brain.
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2. Introduction

I will sing unto the Lord all my life; I will sing praise to my God while I have my being. Psalms 104:33

In this dissertation the writer investigates how music can assist people suffering from dementia. Iceland is currently fourth on the list of countries with the highest rates of death due to dementia per capita after Finland, The United States of America and Canada. Whilst there is still no cure for this disease, there are recognised activities that assist dementia sufferers, one of which is music. Music can be used as a specific way of caring for another individual. All music activities, from playing music on an iPod to singing to playing musical instruments together can be ways of letting someone know you care. It is known that singing releases endorphins, the chemical in our brains that make us feel uplifted.

My interest in writing about how music and music therapy affects people with dementia awoke as I am currently working at a nursing home in the Reykjavík Metropolitan area. Through work, I have observed that when I incorporate music into the lives of the residents, it seems to change the way they feel and facilitate their ability to express themselves. It was these noticeable moments that urged me to write, not only as a staff member at a nursing home but also as a student in the arts of music. This thesis has the purpose to understand how music and music through therapy affect the brain and facilities welfare among those who suffer from dementia.

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1 Psalms 104:33 (King James Version).

2. The powerful form of Music

2.1. The definition of Music

Music. It’s a powerful word. It can mean a lot of different things and can make a person think a lot of different things. The word music comes from the Greek word mousike, which means “the art of the muses”. Muses, meaning a person or personified force who is the source of inspiration for a creative artist. It is a beautiful meaning where the word music comes from. The fact that it indeed comes from a person being creative. That is precisely what music is.\(^3\)

Music is a compelling form of art which plays an important role in many different ways of healing and overall physical and mental health. Music, with its ability to surpass cultural and language barriers that have been put up by society, is capable to promote wellness for the whole person. Music can come in many different forms, such as various instruments, vocals and percussion. It can be used to assist express every emotion. It’s alluring that a few harmonic frequencies put together, in any order, can create music.\(^4\)

Music is de facto an international language that everyone can understand. It is said that it is impossible to avoid music, no matter where you’re from. If we take for example, the isolated residents of the Amazon Forest, who have no contact to the rest of the world. They too have their own form of music. They sing and create sounds together to represent the sounds of the forest. It is the only thing they know and is something that they worship.\(^5\)

It is said that music is the only thing that can let you travel in time. When a song is listened to it can bring back a memory and bring you back to the place where you associate that song with. You can smell what you smelled, see what you saw, feel what you felt, perhaps taste what you tasted, all while hearing the song you heard.\(^6\) Music can indeed help heal

\(^3\) Alex Hardie, “Muses and Mysteries” in Music and the Muses: The Culture of mousike in the Classical Athenian City, (2014), ed. Penelope Murray, Peter Wilson, 11.


psychological wounds. Music wakes up memories and can bring a good feeling to the listener as they remember it from previous experiences.\textsuperscript{7}

Creating music is a powerful way of engaging with all our senses and motor networks and introducing changes and linking brain regions within this network. This is just another reason why music can help those with dementia. It helps connect different areas in their brains, linking these areas once more.

Experiencing music is said to be the most valuable human emotional, sensorimotor, and cognitive experience. It involves listening, watching, feeling, moving, remembering and expecting. It commonly is accompanied by all types of emotions from joys, happiness, bitter-sweet sadness or even such experience that the body reacts without control with reactions such as tears in the eyes, goose bumps and shivers.\textsuperscript{8}

2.2. The History of Music

Since the earliest days of mankind, music, and perhaps more importantly the power of music, has been evident to us.\textsuperscript{9} Even cavemen created their own rudimentary musical instruments which historians and archaeologists have found evidence of. Scientists have used carbon dating with flutes made from bird bones and mammoth ivory found in a cave in southern Germany to show that they were between 42,000 and 43,000 years old. You can’t touch music, it only exist in the moment it is being apprehended, and yet it can profoundly alter how we view the world and our place in it.\textsuperscript{10}

Music is a method that has been used for a considerate amount of time to promote spiritual wellness. It has been a therapeutic tool in healing practices from as far back as 500 B.C. During this time music was recognised for its curative properties. The powerful influence


music had on an individual’s health was recognised by renowned philosophers from this time such as Plato, Pythagoras, and Aristotle. As Plato states:

“Music is a moral law. It gives soul to the universe, wings to the mind, flight to the imagination, a charm to sadness, and life to everything.”

The connection between music and medicine is ancient. It is said that it goes all the way back to Palaeolithic times, though there is no proof of this. It certainly has its roots in a primitive world view. Ever since the beginning of human society, people have had to find solutions with sickness and ailments for both physical and psychological cases. For many sores and physical wounds, the answer was obvious. But for many kinds of ailment the answer was not. Sickness was something of supernatural origin, to the pre-scientific man, caused most likely by an enemy’s evil magic, or by angry spirits of the dead. The only solution that one could come up with was one of its own. In most primitive societies this meant finding a specialist of such, a witch doctor or shaman, the one who had magical techniques and possessed in the correct and necessary equipment which to deploy these evil spirits. This man was capable of contacting the spirits and control them. Witch doctors and shaman would use musical instruments that were made from dead animals. They would create instruments such as the drum, the bow, the flute and the horn. The drum was, and still is, made from the skin of an animal stretched over a frame. Once one would strike it, it would create a booming sound, a sound that was supposedly scare the demons away. When one end of a hunter’s bow was put in the mouth it provided a resonator which made a twanging sound. This eventually developed into the harp as we know it today. The flute was made from putting holes in different parts of an animal bone and gave off high whistling sounds. And from a bull’s horn they created a simple trumpet, of sorts. It was thought, because they were all made from dead animals, that the sounds coming from the dead animal or that the evil spirits that live inside the sick person is able to contact the shaman through the instrument. So, by means of music the shaman may conjure and command the spirits, make them speak their secrets, compel them to do his will. They speak through the notes and sounds of the instruments and also through the shaman’s

11 Paul Nordoff, Clive Robbins, Music Therapy in Special Education, (Missouri: Magnamusical-Balton Inc. 1971)
voice. When the shaman resonates strange notes, his audience recognises that these are the voices of the spirits speaking through him. This is thought to be the origin of music therapy.\textsuperscript{12}

3. Dementia and the brain

3.1. What is Dementia?

Dementia is essentially a progressive failure of most cerebral functions.\textsuperscript{13} When someone has a form of Dementia, the brain itself is getting damaged, slowly but surely. In the end the brain can shrink to around a third of its original size. This is because the brain is a muscle and when it is not exercised, which wouldn’t be done when one has dementia, it decreases in size. The frontal lobe part of the brain is the part that’s in charge of our thoughts, memories, behaviour and movement. This is usually the part of the brain that is affected first.

Dementia is uncommon in people under 60 years old but can still be found. It is usually called Early onset dementia in these cases. Dementia is also not a normal part of getting old. It is a syndrome. It is, however, more common to develop dementia the older one gets. It has been discovered that in every 5 years after the age of 60 one doubles the chances of developing dementia.\textsuperscript{14} The word ‘de-mentia’ actually means the loss of the mind and the word on its own describes the process. Before one develops dementia, they are their normal selves, and at the end of dementia is death. The cause of death in dementia is still unknown. It is usually accompanied by other syndromes that could possibly come with dementia or before. It could also be your run-of-the-mill, old age.\textsuperscript{15}

Dementia usually lasts from 5-15 years. During this time the person with dementia is, in fact, dementing. The rate of dementia varies from person to person, and in different individuals’ brains, fail at different rates. The symptoms of dementia are commonly memory impairment, decline in self-care such as hygiene and decline in work performances, to name a few of many. In dementia there is also a change of behaviour that occurs. These could be uncharacteristic behaviour, social withdrawal or being more introvert than they normally are, personality change, mood change and paranoid ideas.\textsuperscript{16}


Primary and secondary regions in the cerebral cortex play a very important role with any conscious perception of sensory information. Be that as it may, music also changes activity in multi-sensory and motor integration regions in the frontal and parietal lobes. The frontal lobe is involved in guidance of attention, in planning and motor preparation, in integrating auditory and motor information and in specific human skills such as imitation and empathy. This is why the frontal lobe is critical to the acquisition of musical skills and in the emotional expression of music. Multi-sensory integration regions in the parietal lobe and other regions of the brain connect different senses, from ear to eye and touch sensors into a combined sensory impression. The typical musical experience is constituted from by this combined sensory impression.17

3.2. The Brain with Dementia
The brains of many people with dementia, although not all, consists of a loss of neutrons from the brain by shrinkage of parts of the centrum. This condition is manifested by narrowing of the gyri and widening of the sulci. This would be noticeable mostly in the areas of the frontal, temporal, parietal and occipital lobes. This effect would be, however, absent from the primary motor and sensory cortical areas.18

Dementia is a group of symptoms that affects mental cognitive tasks such as memory and reasoning. It is an overall term for diseases and conditions characterised by a decline in memory, language, problem-solving and other thinking skills that affect a person’s ability to perform everyday activities. It is a syndrome, not a disease. What many people don’t realise is that dementia is an umbrella term that Alzheimer’s disease can fall under, not the other way around. There are over 400 different types of Dementia, the most known ones being Alzheimer’s disease, Parkinson’s with Dementia, Lewy Bodies Disease, Vascular Dementia, Frontal temporal Dementia and Early onset Dementia.19

3.3. Risk Factors

It has been discovered that there are a few factors that can cause dementia. There is a sizeable body of information for Alzheimer’s disease for instance. One of which is the genetic factor. A history of dementia in immediate relatives has been found consistently to pose an increased risk. Most type of dementia are not hereditary, apart from Alzheimer’s disease. The stronger the family history of Alzheimer’s disease, the more likely one may develop it in their latter years. Down syndrome is another factor of developing Alzheimer’s disease. Two distinct associations are recognised. Firstly, Down syndrome is known to lead, in nearly all adult cases, to neurological changes equivalent to the characteristic of Alzheimer’s disease. Although it is less apparent whether they are accompanied by the clinical syndrome, or not. Secondly, an association exists between Alzheimer’s disease and the history of Down syndrome in a first-degree relative. Another factor that has been thought of but not yet proven is left-handedness. The association between being left-handed and Alzheimer’s disease is suggested that the left hemisphere of left-handed individuals may be more vulnerable to dysfunction. Head injury is known to be another factor of development. This would include a history of previous head injury with loss of consciousness as a significant risk factor. It has been found that head injury was associated with sporadic but not familial Alzheimer’s disease and is more apparent in men rather than women. A previous history of thyroid disease, epilepsy, severe headaches and migraines were also inversely related to Alzheimer’s disease, mainly found in women. No link has yet been found between Alzheimer’s disease and neurotropic viruses, allergic disorders, general anaesthesia or blood transfusions but there have been studies on it.20

4. Music Therapy

4.1. Music as a form of Therapy

The practice of music as therapy began in the 1950s. In the early years of the twentieth century, music was used in hospitals mainly to boost morale, as a general aid to convalescence and as an entertaining diversion. Physicians invited musicians to play to large groups of suffering people on the vague assumption that it might activate metabolic functions and relieve mental stress.\(^2\)

There are six major health benefits of music therapy that Craig defines: Reduces anxiety and physical effects of stress; Improves well-being and healing; Can help manage Dementia; Reduces depression that is commonly seen in the elderly; Reduces symptoms of psychological disorders and mental illnesses; Music therapy improves self-expression and communication.\(^2\)

Mindfulness-based therapy focuses more on teaching one to become the observer of their thoughts and feelings. Variations of mindfulness-based therapies include mindfulness-based stress reduction, mindfulness-based cognitive therapy, acceptance and commitment therapy and dialectical behavioural therapy.

Humanistic therapy uses a range of theories and practises to help one understand and enhance their mental wellbeing. This approach suits people interested in exploring their lives and looking at their issues from a wide range of angles. Variations of humanistic therapy include integrative psychotherapy, person-centred counselling and gestalt therapy. Interpersonal therapy focuses on one’s relationships with others and is based on the idea that poor mental wellbeing is rooted within interpersonal relationships.

E. Thayer Gaston, however, is known as the father of music therapy in the modern world. He declared that music therapy should be an officially recognised tool in the medical community. Gaston initiated three core principles for the use of music therapy and the impact it has on an individual. The first one being that music therapy can assist one invent or re-invent certain interpersonal relationships. Secondly that music therapy benefits self-esteem through trust and self-actualisation. And lastly being that music therapy uses the

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potential of rhythm, which is more times than not forgotten, to bring the individual calmness and regulation.

The main goal of music therapy is to reach the goal of the individual. Music can affect several different things in a client including attention, emotion, cognition, behaviour, perception, and communication. Therefore, it is used with people with dementia.\(^{23}\) It is a possibility to use music therapy as a non-pharmacological treatment for the symptoms of dementia, mainly behavioural and psychological symptoms.\(^{24}\)

There are four main ways of using music therapy. One of them being singalong. It would be done in a way which would be a lot more informal than a choir but still singing songs together. It would be done with people with dementia with music from their era. It is fun, it sparks memories and it’s freeing to just sing along with everyone else. Another way that music therapy is used is called blackout song-writing. In this way the music therapist would choose a few songs that represent recovery and let the client take words out of the songs and make up their own song. The idea behind it is to blackout the words that the client does not wish to use. Including these two, there is also a method that is known as musical hangman. This is where a thematic picture is drawn on a board and the clients are asked to guess the missing word before the picture loses all the details. Then they are asked to choose a word and to listen to songs and guess the correct word. The final main way of using music therapy is blues song-writing. The music therapist explains how blues songs are written and the clients then write their own blues songs from their own experience while simultaneously putting in a positive coping mechanism. That way, when they sing it on their own, they’ll remember their own coping mechanism.\(^{25}\)

Melodic Intonation Therapy is a technique used by many music therapists. This is where they allow the client to sing a simple phrase, such as what their name is, and to tap out the rhythm while singing it. The clients then learn these phrases by heart, and they can then use them on a daily basis. This method works because music and rhythm bypass the


central executive. Language is localised in the left-hand side of the brain, whereas music is on the right-hand side. Melodic Intonation Therapy helps create a pathway from the left brain to the right.\textsuperscript{26} Therefore, many people who cannot speak, can still sing. For someone with a stutter for instance, who is unable to speak with diction, it is common that therapists will allow them to sing what they want to say or listen to music while reading a passage from a book so they can’t hear themselves saying it. In most cases, the person with the stutter can dictate words a lot better than they would normally. We see this technique being used in famous movies such as \textit{The King’s Speech}.\textsuperscript{27}

Music can be a life assistant in the tumultuous sea that dementia is. However, the best results appear when the music is created for each particular individual. When the sun is setting on the life of someone with dementia, it steals their ability to communicate through spoken words. It is often that they are in the same spot for hours, doing seemingly nothing, implying that their minds are permanently lost and are nowhere to be found. That being said, if music from their era, their “golden days”, is played for them, more times than not, their faces will light up with expression and emotion and we catch a glimpse of the person they once were. Their minds have been found from this faraway place. This moment is worth 1000 words.\textsuperscript{28}

There is however a difference between music for relaxation and music for stimulating imagery. This is important for people to know as it is not recommended that people should be listening or playing stimulating music all the time. It is therapy after all and we shouldn’t be in therapy all day, every day. The most effective music for relaxation includes a steady pulse, is quiet in mood and is predictable to an extent. More times than not it is a monophonic or homophonic piece. There is not an awful amount of dynamic change as the purpose of the music is to relax the listener and their body and mind. By comparison, music to stimulate imagery is more changeable in instrumentation and would most likely

\textsuperscript{26} Indre Viskontas, \textit{How Music Can Make You Better}; 52-53.

\textsuperscript{27} \textit{The King’s Speech}, Tom Hooper, (London: Colorado, 2010).

\textsuperscript{28} Indre Viskontas, \textit{How Music Can Make You Better}; 58.
be polyphonic. It would have more dynamic change and lead the listener to stimulate imagery through the music.29

4.2. How Music affects the brain neurologically
A study was done by H.B. Svansdóttir and Jón Snædal in 2006. The case-controlled study was carried out in two nursing homes and two psychiatric wards by qualified music therapists. There were 38 residents living with Alzheimer’s disease and were assigned randomly to a music therapy group. The study showed a significant reduction in activity disturbances in the music therapy group as well as aggressiveness and anxiety. It was conducted over a 6-week period and activity disturbances were measured with the Behaviour Pathology in Alzheimer's Disease Rating Scale (BEHAVE-AD).30

Canon Harford, an accomplished musician and Minor Canon at Westminster Abbey in the late nineteenth century, had discovered that music could be an effective treatment for certain medical conditions. He did experiments of his own using medical and musical criteria. He described an occasion where he had succeeded to induce sleep in an elderly sick woman, whilst using soothing music and a passage from the bible. His idea was that music could alleviate pain and anxiety, thus having a sedative effect. He then managed to convince and organise professional musicians to perform for subjects taking part in his experiments. He ended up being a founding member of The Guild of St. Cecilia which was dedicated solely for people in need of staying in hospitals. After Hanfords death, The Guild of St. Cecilia unfortunately died with him but the precepts from his venture may be summarised as such: Music has the power to affect patients in physical or emotional stress; Music is effective as a form of treatment, alongside medical intervention; There needs to be co-operation between the medical and musical professionals; Training is essential

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before undertaking the work; The efficiency of the work must be established by systematic
evaluation and the publication of research findings.31

It is quite incredible how the brain keeps musical information even when it’s deteriorating
from dementia. Oliver Sacks, the author of *Musicophilia* and physician, received several
letters from relatives of loved ones with dementia. One man speaking about his wife said
that even though she has had dementia for seven years, she still plays the piano daily and
has personal goals to memorise certain pieces. Another writes about a well-known pianist
who was 88 years of age at the time. The pianist who, despite losing his ability to
communicate with words, still plays complicated repertoires from when he was younger,
flawlessly. He continues to play piano everyday even though his language has begun to fail
him. Another letter received from a woman speaking about her father writes that her
father’s dementia is progressing rapidly and he cannot recall much from his life. He can,
however, sing the baritone part to almost every song he sung, in a twelve-man a cappella
group, that he was in for more than 40 years. This man doesn’t remember where he lives,
what he worked as, or even what he did a few minutes before. The one thing he can
remember is his music.32 Creative Music Therapy is a practical approach in its base. The
insights of it come mainly from the experience of making music with several people from
different backgrounds with different needs and in different situations.33

There is a real need for a view that complements the medical side of people suffering from
physical or mental illnesses. It is often that they find themselves in a situation where the
scientific medicine treats them by continually “checking their numbers”, so to speak. The
person in question may feel as though they are gradually becoming a patient, which
derives from the word ‘passive’, and also becoming an object. Doctors and nurses talk
over them, giving them information that the person may not understand and often more
than one medical expert in the room. It only makes sense that one may start to feel this
way. It may seem as if nobody sees them as a whole. With music therapy however, the

31 Helen M. Tyler, “The Music Therapy Profession in Modern Britain,” in *Music as Medicine: The History of
375-378.


33 Gary Ansdell, *Music for Life: Aspects of Creative Music Therapy with Adult Clients*, (United Kingdom: Jessica
opposite occurs. The person who is creating the music themselves can be seen and heard as whole, something of quality, not just quantity.\textsuperscript{34}

Although it is well documented that music can help people with dementia in self-expression following music therapy, there is some disagreement in the literature on whether it actually improves language skills or if the interpersonal interaction with the music therapist may be responsible for the improvements.\textsuperscript{35}

\footnotesize

5. Discussion

After I began researching for this dissertation I found improvement in my work ethics at the nursing home. I’m a lot calmer with the residents who are going through a difficult time due to their dementia. I don’t use music as a tool straight away when they are showing signs of agitation. I try to talk to them first and see if we can discover a solution that could help them. On few occasions a resident may have been annoyed because they believed that it had been a long time since they had visitors. The truth is that they did have visitors recently. Once I explain that to them and I tell them who came and what news they had, their agitation seems to lessen. However, sometimes just talking to the residents doesn’t work. They may be making no sense or they may be showing signs of violence. In this situation I believe that music would work for them.

Furthermore, when I remain calm with the residents at work, they tend to be calmer themselves. I try to hold their hands or touch them in a way that they can sense that I’m safe and that I’m a person that they can trust. I tempt them to sing along with me with songs they would recognise from their youth. We then have a discussion about the song, such as; when did they hear it first, what do they think of when they hear or sing it, how does it make them feel. At first I asked these questions because I was genuinely interested. As I became aware that it made improvements on their daily lives it became obvious to me what the positive effects were.

There is one resident who is incoherent in her speech. She makes up words while she talks and sometimes switches languages mid-sentence. However, she seems to speak as if she’s making perfect sense. For instance, one day I tried singing a song with her whilst we walked along the corridor and she started walking to the beat of the song. While walking to the beat she started singing the melody of the song to “la la la” and I understood her. At that point a new way of communication opened up to us and it was all thanks to music.

I find that when I use music at work, it brings nothing but joy to the residents, myself, and also to my colleagues. My colleagues start humming the songs that I sing or even start singing with me. That is truly a beautiful and magical moment. Music is such a simple thing and it’s so easy to do. It’s a lot harder for someone to think of though if they don’t have the training to do so. To sing a verse and chorus to a song can make someones day.
They may even forget this moment, but the memory lives on in the heart and another day with dementia can seem lighter. Sometimes I would compare it to a newborn to a young toddler. They may not remember some activities or family outings that they did throughout the day, but it doesn’t matter. It’s how happy they are in that moment that that counts. One can have the memories that were made and build up on a relationship with them.

Despite the overwhelming amount of research done in the field of music therapy, it is sad to see the lack of it being incorporated in the daily treatment in nursing homes in Iceland. I would urge nursing homes in Iceland to use this information to try and incorporate music in their therapy programs. Having experienced it first-hand, albeit without any medical findings to back-up my findings, I believe that it would have tremendous positive effects. Happier and more emotionally stable residents, which furthermore results in reduced work load and overall improved employee satisfaction.
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