**MUSIC OF OUR MIND**

**Presentation Text**

Michael C. Patterson

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This is the script I prepared for a masterclass for *Encore Creativity*, the national largest choral organization for older adults, presented via Zoom on June 3, 2023. I didn’t read from the script – perhaps I should have - but spoke extemporaneously. The recording of the session, therefore, will differ in some ways from this script, but the same basic ideas are covered. Large sections in italics were not covered in the actual class. The headers for the paragraphs below track with the headers for the slides used in the presentation.

INTRODUCTION

Just to give you some background on my experience that is relevant to our discussion. I developed and ran the Staying Sharp brain health program for AARP from 2004 to 2009.

Staying Sharp was a partnership with the Dana Alliance for Brain Initiatives which worked with the top neuroscientists in the country who made a commitment to talk about their work in plain language so that the general public could understand what was being learned.

I got to interview over a hundred different neuroscientist around three main questions. What do we need to know about the brain to have an intelligent conversation? 2) Why does the brain weaken in some as we age? 3) What can we do to prevent cognitive decline and dementia?

And you hear a lot of different opinions and points of view about these questions because each scientists specializes on one area or the pursuit of one hypothesis. I made it my role and mission at Staying Sharp to be the generalist who looked at the big picture. I tried to put all the information together into a unified and coherent narrative that could be understood by AARP membership and the public.

While at AARP, I met Dr. Gene Cohen and was able to provide finishing funds for his seminal research on creativity and aging. As I hope you know, Encore Chorale, under the leadership of Jeanne Kelly, was one of the arts groups studied by Dr. Cohen and is the group that provided the most useable data. And it found that people who sang in the chorus had improved medical conditions and improved mood.

Through Dr. Cohen I got involved in the beginnings of the creative aging movement. He invited me to serve on the Board of Directors for his new organization, The National Center for Creative Aging, which supported professional artists who worked with older adults. I developed and the research committee for NCCA.

After leaving AARP, I joined with a colleague, Roger Anunsen, to found MINDRAMP to continue monitoring the research and to refine the big picture understanding of brain health and aging.

MY MINDRAMP ORIENTATION

Our mission at MINDRAMP was to provide people with the evidence-based information they needed to *live long* and to *live well*.

I coined the term QUALONGEVITY to capture the idea that we want to live as long as we can and to maintain a high quality of life for as long as we can. We aren’t really interested in adding years if it just gives us more time to suffer. We want longevity plus quality of life - Qualongevity.

The human species has survived and thrived because it has incredibly nimble bodies and nimble minds. How can we maintain as much nimbleness as possible as we age. My search for answers has focused largely around two areas: Brain Health - how can we keep our brains healthy, and Mental Management - how can we develop mental states that promote happiness, fulfillment, peace-of-mind. How can we continue to flourish as we age?

CORE TOPICS

So, the core topics I’d like to explore for today’s class are:

1. Some thought about the purpose and power of music.
2. We can then discuss what I mean by brain health and consider how music might contribute to keeping brains healthy as we age
3. Finally, I want to discuss what I mean by mental management and consider how music might help us to manage our minds as we age.

SECTION ONE: THE PURPOSE & POWER OF MUSIC

Programs, like Encore Creativity, that bring the arts to the general public, are always looking for financial support, which is a challenge because the arts are always considered a kind of luxury item. Arts programs are wonderful and nice, but they aren’t a top priority.

In funders minds, the Arts play second fiddle to “important activities” like addressing poverty, feeding the hungry, making sure our children are educated and stimulating economic growth. It isn’t immediately evident that music has anything to do with the basic needs associated with survive and thrive in our modern world.

As opera singer Renee Fleming put it, “The problem is that, for far too long, the arts have been dismissed as soft or a nice-to-have, not serious or worthy of institutional investment in the realm of health.”

There is also controversy in the world of neuroscience as to the evolutionary function of music. Did humans evolve with an innate capacity and desire to make music? Or, is music a side benefit of some other more basic adaptive characteristic? There is a good discussion of this argument in Daniel Levitin’s book “This Is Your Brain on Music: The Science of a Human Obsession.”

So, there is always this persistent question of what are the arts for? What is music for? To put in in stark terms, “How important is music to the human ability to survive and thrive?” Does music really matter?

NEUROAESTHETICS

Semir Zeki has been called the father of neuraesthetics, the study of the neuroscience of the arts - the brain and the arts. He said something that helped me to reframe this question about the purpose of the arts and music in a useful way.

I’m paraphrasing because I don’t have his actual quote. But he said something like, “Ask not the purpose of music, ask instead the purpose of sound.”

Is sound important to our ability to survive and thrive? How important and fundamental is our ability to:
Hear our environment, to function well within our soundscape; to interpret what is happening
How important is our ability to communicate with each other through spoken language?

From this perspective, our ability to hear effectively and skillfully is pretty darned important. The connection between sound and music is quite straightforward and easy to grasp.

MUSIC IS ORGANIZED SOUND

The second useful reframing builds on the first. It defines music as organized sound. Music is our way of playing with our innate ability to process sound. Singing is our way of playing with, expanding, and developing our ability to produce sound.

Since hearing and vocal communication is essential to our survival, it would make sense that evolutionary forces have structure our brain to enjoy exploring and strengthening these abilities. Music is a highly pleasurable way to hone our ability to hear well and to interpret the fundamental elements of sound.

Play is our most fundamental way of learning and developing our native skills. I like to think of the arts as adult play. The arts and sports are the way adults get to enjoy the pleasure of play and to benefit from the developmental benefits of joyful engagement.

I think this framing of music makes it clear that music is a foundational aspect of our ability to thrive as functional human beings.

MUSIC IS ORGANIZED ENERGY

So where does the *power* of music come from?

On a fundamental level, music is organized energy. Sound is energy. And it is this capacity to manipulate energy effectively that gives music its power to affect our physiology.

Music is organized sound waves, pulses of energy that move the mechanisms of our ear. That energy is converted into the energy of electrical impulses and chemical signals that energize the cells in our bodies, including the neurons and glial cells that animate our minds.

ENERGY DRIVES BRAIN PLASTICITY

This point was driven home to me in a wonderful book called THE BRAIN’S WAY OF HEALING by Norman Doidge. Doidge has written the two best books on the market about brain plasticity. His first book, THE BRAIN THAT HEALS ITSELF, tells the story of how neuroscientists came to realize how plastic and malleable the brain is – over the course of our entire lives.

In THE BRAIN’S WAY OF HEALING, Doidge discusses innovative ways that scientist and clinicians have been able to stimulate the plasticity of brain to promote healing. He summarized the neurological mechanisms of the healing process as including three major steps, which are instructive for this idea of music as energy that can heal the brain.

Neurostimulation - He points out that any kind of energy that gets into the brain has the ability to energize brain cells, to wake them up, to stimulate them to become active.

Neuromodulation - Once energized, brain cell activation can be modulated. Different types of energy cause different types of change within the cells and with the way they communicate and connect with each other.

Neurodifferentiation - Finally, the activity of the cells can be finely tuned to operate at maximum capacity. This is why, for example, playing music improves abilities like hearing a single voice in a crowded room, or being able to hear subtle differences in timbre and pitch. The repetition and reinforcement of organized energy trains the brain to do a better job.

So, to summarize,

Music is organized sound
Sound is energy
Energy is power
Music is organized energy that can affect positive plastic change in the brain and body.

So, with this context about music in mind, let me shift to the topic of brain health.

WHAT IS BRAIN HEALTH

So - Brain Health. What is brain health.

When I use the term brain health, I am referring to the structural integrity of body and brain. I approach brain health from a preventive point of view. It is much easier to prevent damage from happening than it is to repair and compensate for significant damage once it has occurred. What we want is a brain that is resistant to injury and disease and a brain that is resilient and does a good job of repairing whatever injuries occur and recovering from illness.

BRAIN & BODY

When we talk about the brain, we need to remember that body and brain are intimately connected. The brain could not function without a body and our complex and nimble bodies could not function without our nimble brains.

There is constant communication between body and brain - a kind of endless feedback loop. Signals flow as much from the body to the brain as from the brain to the body.

When we understand the intimate connection of body and brain, it becomes clear that the health of the brain is dependent upon the health of the body. We need our circulatory system to maintain its structural integrity so that there is a constant supply of blood to the brain.

Our respiratory system needs to be working well to keep oxygen available to body and brain. There is growing recognition that our gut and out brains have an intimate and complex relationship. The health of diverse bacterial species in our gut can affect not only our general health, but also our psychological well-being, our moods and our affect.

BRAIN RESERVE & COGNTIVE RESERVE

We also want our brains to build up what is called brain reserve and cognitive reserve. Because the brain is plastic, healthy brain cells will often compensate for cells that are compromised. So the more healthy brain cells you have – the more brain reserve you have – the better the brain can compensate for declines associated with aging, or illness. Cognitive reserve refers to a build-up of multiple cognitive strategies. The more flexible and adaptable your thinking, the better you can continue to solve life’s problems, even when cognitive functions start to become compromised.

STRUCTURAL INTEGRITY (NOT USED)

*What do we mean by structural integrity?*

*I want to use two metaphors to answer this question, one mechanical and the other organic. In general, it isn’t a good idea to use mechanical metaphors to describe living, biological activities, so take the computer metaphor with a grain of salt.*

*Using the machine metaphor, we can equate the structure of the brain with the mother board of a computer. It is the basic hardware of the computer -the chips, the connecting wires and so on. The hardware needs to be working properly in order to run the software - the video games, the spreadsheet programs and so on.*

*Shifting to an organic metaphor, we need the structure of our bones, joints, ligaments, and muscles to be in good shape to support our ability to dance and sing. If our vocal cords are restricted or scarred it is more difficult to produce a good sound*

*More specifically, brain health refers to the structural integrity of the physical cells and functional modules that enable the brain to work.*

*Our brains are made up of an estimated 86 billion neurons. Many people don’t realize that our brains also contain an equal number of Glial Cells. Some estimate that there are as many as ten times the number of glial cells as there are neurons. Glial cells communicate via chemical exchange; neurons both chemically and electronically.*

*The point to take in is that there are an awful lot of very complex cells in our brain that need to be working properly. When enough brain cells are compromised, we begin to experience cognitive decline. The too many brain cells are compromised we begin to suffer dementia.*

*The brain cells get organized into functional modules that perform specific tasks to support our behavior and our thinking. These include evolutionarily primitive structures like the brain stem and more recently evolved structures like the cortex - the outer layer of folds - and the frontal cortex, often referred to as the executive brain. All of these modules need to be functioning well.*

*The different areas and modules of the brain are connected to each other. Some connections are more fixed and stable, some operate in linear fashion, linked like beads on a necklace. Other connections are more fluid, changeable and dynamic. It is those connections that give our brains the dynamism, the nimbleness that supports our flourishing.*

So - How do we keep all these myriad structures in good working order?

SECTION TWO: BEHAVIORAL ROOTS OF BRAIN HEALTH

Much of the research on brain health has focused on finding a magic bullet that will, somehow, manage to address all these myriad structural concerns. Not surprisingly, this approach has not been very successful.

Other research focused on identifying specific types of behaviors and specific conditions that either helped the brain stay healthy or put the brain at greater risk.

It became clear to me early on in my tenure at AARP - and it is now a more accepted approach - that the way to keep our brains healthy was to do more of the protective behaviors and less of the risky behaviors.

As I said, the research was highly specialized and spread out all over the map, and I wanted to organize it so that we could begin to see the big picture. So, we began to evaluate and the evidence on risks and protective factors and categorize them. What emerge was a group of behavioral areas that we now call the Behavioral Roots of Brain Health. As you can see, the eight roots are:

Physical Exercise & Movement Mental Stimulation
Social Engagement
Stress Management

Sleep
Diet & Nutrition

Medical Care

Environmental Factors

HOW TO WORK WITH THE BEHAVIORAL ROOTS OF BRAIN HEALTH

Let me lay out some guidelines about how to work with the Behavioral Roots.

PLASTICITY Changes occur in your brain because it is plastic. The structure and function of your brain is constantly being altered by what happens internally - within your body and externally - whatever is going on in your environment.

Plasticity works in both directions. When you engage in protective activities your brain changes in positive ways, generally following the use-it-or-lose it rule. Brain structures that are engaged and put to work receive supporting resources and get stronger. Those that aren’t used don’t get the resources and weaken.

BRAIN RESERVE – By amplifying the protective factors and minimizing the risk factors we promote positive plastic change, retard negative plastic change and build brain reserve. More healthy brain cells, Functional modules and networks

RULE OF THE 4 C’S - We developed what we call the Rule of the 4 C’s to capture some important ideas about working with the Behavioral Roots.

Causes - interventions to promote brain health need to address the root causes of structural decline, not the symptoms. It does no good to take an aspirin to relieve your headache if you keep banging your head against a wall.

Combinatorial - You need to address all of the Behavioral Roots. They are synergistic. They work in combination with each other.

Customized - Every brain is different. The older you get, the more differentiated your brain become. So, be wary of one-size-fits-all solutions. You need to customize your interventions to address your unique needs and your unique circumstances.

Continual - For the most parts, these are not quick fixes. You can’t exercise like mad for a week and expect to have solved your physical exercise needs. Exercise needs to become a regular aspect of your lifestyle. It’s the same with all of the Behavioral Roots.

It’s now time to bring music into the discussion.

HOW MUSIC MIGHT INFLUENCE THE BEHAVIORAL ROOTS OF BRAIN HEALTH [I stayed on this one slide for the discussion of the eight behavioral roots.]

What I’d like to do now is briefly talk about each of the Behavior Roots and how music and sound more generally, might serve to stimulate positive plastic changes to enhance protections and diminish risks.

I’d like you to join me in this inquiry. Think about your own experience and share some of your insights during the Q & A session.

I hope you all receive a handout called BEHAVIORAL ROOTS OF BRAIN HEALTH: RISK & PROTECTIONS. It’s a quick guide to what you should and should not do in each behavioral area. You can use it as a reference when we go through each area.

PHYSICAL EXERCISE & MOVEMENT

Movement, of any kind, is essential to the health of your body and brain.

There are some neuroscientists who suggest that the only reason we have a brain is to promote meaningful movement. We need to move to find food and to avoid becoming food. We need to move to breathe, to speak, to swallow.

Sea squirts use their brains to swim around until they find a suitable location to spend the rest of their life. Once they have found their spot, they eat their brains. They never need to move purposely again, so their brains are not necessary. Human beings need to move, so we have brains that are intimately connected with our bodies and with movement of all kinds.

So, the major risk factor is not moving. Living a sedentary lifestyle.

The major protective factor are first, movement of any kind. Beyond that we recommend focusing on five types of movement:

1) Aerobics - Aerobic movement that elevates your heart rate and respiration.

2) Strength - Movement that promotes the strength of anything that moves. So, not only the muscles of your arms, legs, torso and core, but also the strength, for example, of your vocal mechanisms.

3) Flexibility – We need to remain nimble and need to make sure that anything that moves can move to maximum capacity.

4) Balance – We need to exercise our proprioceptive sense so that we can remain standing and avoid falling down. Falls are dangerous, particularly as we age. We want to avoid hitting our heads on sharp, hard surfaces.

5) Posture – We need to maintain good alignment of muscles, bones, sinew and fascia. When we stand in proper alignment everything works more smoothly.

So, how might music and singing help you move in ways that promote brain health? Again, I invite you to comment on this during the Q & A section at the end.

I think the benefits range from gross motor stimulation that is involved in getting out of your house and going to rehearsals, down to the fine motor control of vocal cords, lips and tongue needed to produce beautiful sounds.

Music is wedded to dance. What are the ways that music encourages us to move?

Let’s move to MENTAL STIMULATION.

MENTAL STIMULATION

I call this area mental *stimulation* to anchor it in structural and physiological changes as opposed to psychological changes. What can we do to strengthen brain structures that support cognitive activity in general?

The risk factors here are consistent with the use-it-or-lose-it principle. If you exercise your brain in certain ways, you will promote positive plastic changes. We recommend engaging in mental activities that have the following characteristics.

Novelty – You are engaging with new ideas, new skill sets, new activities. If you do the same thing over and over again, that specific skill gets strengthened, but it also makes it harder to do something different. If we keep pouring our thoughts and ideas into the same channel, we will cause drought conditions in other parts of the brain.

Challenge – In the same vein, easy problems take little mental effort and provides only modest stimulation. We are searching for FLOW conditions in which the challenge is sufficient to be stimulating, but not so challenging as to feel impossible.

Complexity – The more complex a mental problem, the more parts of the brain (and body) are engaged and stimulated.

Meaning – Mental activities that are meaningful engage your emotional brain and ramp up the investment of energy. Doing Sudoku, for example, may be fun and will engage the numbers part of your brain but it will not be as beneficial to your overall brain health as, for example, doing the accounting for a favorite charity, or doing your own budget.

Does your experience with Encore Creativity give you the opportunity to use your brain in ways that are novel, challenging, complex and meaningful? I think the answer, obviously is yes and I’d love to hear your thoughts on this.

SOCIAL ENGAGEMENT

There is a growing body of research that positive social relationships are essential for our health and well-being. It should be obvious. We are highly social animals. We can only survive and thrive through support and collaboration with others. Friendship, generosity, and cooperation make us feel good, they flood our brains with endogenous opioids. The release of oxytocin amplifies our bonding with loved ones and with our tribes.

On the flip side, we feel real pain when our relationships are threatening, when we feel socially rejected and when isolation turns into loneliness.

So, how does music serve to prevent isolation and loneliness? How does I create social bonding? Does your involvement with the Encore Creativity have any impact on your sense of social acceptance or social rejection?

STRESS MANAGEMENT

Of course, many of the dynamics of social engagement are related to stress and our ability to manage our stress.

It is important to remember that there is good stress and bad stress. We evolved a robust stress response to protect ourselves from danger and to alert us when our homeostatic balance has been lost. When our blood sugar is low we feel the stress of hunger and know to eat.

Acute stress, short-term stress is generally beneficial and can be considered protective of body and brain. The body responds to fight-or flight situations by activating muscles with adrenaline so that we can move more effectively. When the threat subsides so does the adrenaline.

The danger of stress comes with chronic stress, stress that continues even after the threat has abated. The adrenaline keeps pumping and becomes toxic. Survival functions continue to be fed, while normal living functions are starved of resources. Our body is thrown out of homeostatic balance.

The physiological aspects of stress are highly connected with our autonomic nervous system and the Vagus nerves. And they, in turn, are highly connected with our breathing. In broad terms the ANS regulates our cycles of excitation and relaxation. When we inhale, we activate our sympathetic nervous system which is excitatory and energizing. When we exhale we activate the other aspect of the ANS, the parasympathetic nervous system, which calms us down and promotes rest and renewal.

When we are stressed we instinctively take a deep breath so that we can follow with a long slow exhalation. As an actor, in my early days, I learned that we can stimulate different emotional states by regulating the way we breath. Short, staccato breathing can stimulate agitation and tears. Steady breathing signals confidence and calm.

When we breath we exercise this fundamental cycle of life, pulsing between excitation and relaxation. When we sing, this exercise is ramped up to super-star status. I think it reasonable to think that people who are more skilled and practiced at regulating their breath are better able to manage their stress levels, at least on this physiological level. There are, of course, psychological aspects of stress management that we can discuss later.

What is your experience with stress and singing?

DIET & NUTRITION

There are a couple of behavior roots that would seem to be little influenced by music and sound.

What you eat and ingest is critical to the health of your body and brain. But the connection to music does not seem that strong or obvious.

I’ll leave this one to you. Does singing with the chorale have any effect on what you eat or how much you eat? Are you more likely to avoid processed foods and to eat a Mediterranean diet if you sing in harmony?

SLEEP

Getting a good night’s sleep is incredibly important. Insomnia and sleep deprivation are major risk factors for cognitive decline and dementia. We need to get 6-8 hours of quality sleep per night, including good periods of REM sleep and Deep Sleep. REM sleep is when we consolidate memories. Deep sleep is when the brain renews and repairs itself and when it flushes out the metabolic waste material that has accumulated during the day. If you don’t get sufficient deep sleep, you aren’t cleaning out your brain and are allowing gunk (plaques, tangles, etc.) to accumulate.

There might be more connections between music and sleep. To the extent that music can take our minds off our ruminations about the past and anxieties about the future, it could help us to get more quality sleep. Music may help reduce stress that keep us from getting to sleep and makes it harder to return to sleep after waking up in the night.

Have you noticed any connections between your singing and your sleep?

ENVIRONMENT

Basically, an enriched environment is good for your brain, because the enrichment is novel, stimulating and challenging. An impoverished environment on the other hand is bad for the health and wellbeing of your brain because it provides no such stimulation. Worse, a toxic environment can damage your brain. Pollution - including noise pollution - has been shown to increase cognitive decline and the risk of dementia. Living in poverty conditions burdens children with handicaps that stay with them throughout their lives.

Just as we move through different landscapes, we also move through ever- changing soundscapes. Our environment is filled with sound - some of it is music, some of it language, some of it noise.

Noise is damaging to our auditory system and to our brains. It muddies the signals making it harder to hear, to think and to remember.

On the other hand, organized sound - music - is a highly effective, way to enrich one’s environment. With ear buds and smart phones we can all orchestrate the sound tracks of our lives, our own, portable soundscapes within our own minds.

How does you use music to enrich your environments?

MEDICAL

I’ve left medical care to the end because interest in the medical benefits of music is high. There is a lot of anecdotal evidence that music improves health. And, gradually, more rigorous research is being conducted.

I hope you are familiar with the NeuroArts Blueprint Initiative that is being spearheaded by opera singer Renee Fleming and former head of the NIH, Francis Collins.

Its mission is to cultivate an ecosystem for neuroarts, defined here as, quote, the ‘transdisciplinary and extradisciplinary study of how the arts and aesthetic experiences measurably change the body, brain, and behavior, and how this knowledge is translated into specific practices that advance health and wellbeing.

They are looking at the health impact of all the arts, but research on the impact of music is particularly robust.

In her book OF SOUND MIND: HOW OUR BRAIN CONSTRUCTS A MEANINGFUL SONIC WORLD, neuroscientist and musicologist Nina Kraus notes that “Music is increasingly entering mainstream medicine.” She provides a summary list of these benefits.

* Traumatic brain injury
* Mitigating the stress that accompanies intractable illness
* To mitigate memory loss in dementia
* To strengthen language skills in children with autism and other language and reading difficulties
* To help with motor disorders, like Parkinson’s Disease, stroke and difficulty with respiration, swallowing and speaking
* Mitigate hearing loss and improve speech understanding and the use of prosody.

*There is an illustrative story about the effects of music on health, both negative and positive involving Gregorian chants. In the 1960s, Vatican II ordered French Benedictine monks to replace their chanting in Latin with vernacular prayers. Robbed of their daily chanting, the once vibrant monks, became listless, irritable and chronically exhausted. Disease rates soared.*

*In 1967, the French hearing specialist Alfred Tomatis was called in to see if he could help the monks. He found 70 of the 90 monks lying listlessly in their cells. He also discovered that they had experienced significant hearing loss. Denied the ability to chant, the monks hearing grew worse and the hearing loss seems to be correlated with declines in physical and mental health.*

*Tomatis proposed a two-part treatment. First, he used his own unique brand of auditory training that he invented, called the Electronic Ear, and second, he had the monks reinstitute their daily chanting. Within nine months, the monks had experienced an extraordinary recovery.*

*Tomatis’s auditory training technique is highlighted in the wonderful book about brain plasticity called HOW THE BRAIN CHANGES by Norman Doidge.*

*Tomatis was a highly creative and inventive doctor who specialized in problems with hearing. He was one of the first to demonstrate the occupational health hazards of loud noises and to recognize that deafness - caused by jet engines, gunfire and explosions - could lead to movement and psychological problems.*

*Tomatis also proposed that the ear, not the larynx, was the essential organ for singing. He demonstrated that the voice can only contain the frequencies that the ear can hear. This came to be known as “the Tomatis effect.”*

*He recognized that the high intensity sound produced inside singer’s heads could cause them to become deaf, particularly to higher frequencies. When they became deaf to these frequencies, they could no longer sing those high notes well. Tomato’s second law is that the voice can be healed by restoring the ability to hear the lost frequencies.*

*This is just what Tomato’s Electronic Ear does. When a singer sings into the device, their voice is filtered to block lower frequency sounds, which makes it easier for them to hear their higher frequencies. Gradually, over time, the ability to hear higher frequencies once again enables the signer to sign those high notes again.*

HEARING: EAR & BRAIN

I have seen recent reports stating that hearing problems are the number one risk factor for cognitive decline and dementia.

RISK:

1. Communication is compromised, limiting social engagement and mental stimulation. When we can’t hear what’s going on we withdraw, fail to socialize, and exacerbate our loneliness.
2. Reduced stimulation of the brain results in negative plastic changes that reduce cognitive abilities.
3. Hearing aids enable the brain to receive more sound and also better-quality sound, which enhances neurostimulation, neuromodulation and neurodifferentiation (as per Doidge).

SECTION THREE: MENTAL MANAGEMENT

Let’s move now to Mental Management. How can we manage the way we think to maximize our quality-of-life as we age? How can we learn to stop doing all the little neurotic things we do to drive ourselves crazy and make ourselves miserable? How can we, instead, learn how to optimize our happiness, meaning, fulfillment and peace of mind? How can we maintain equanimity in the face of whatever old age throws at us?

I continue to struggle with these questions. I have had to look beyond neuroscience. I’ve expanded my search into, evolutionary psychology, positive psychology, the science of happiness, philosophy and even – a really big stretch for me - into religion and spirituality. I’ve found a lot of intriguing and provocative insights in Buddhism, Taoism and Zen, in Christian mysticism, in the revival or research on psychedelics.

MCGILCHRIST

It is only in the past year that I feel I have found a unifying concept that weaves these separate strands into a coherent and actionable strategy. I have been profoundly influenced by the incredible scholarship of Iain McGilchrist and his exploration of hemispheric lateralization, explained in his two recent books THE MASTER AND HIS EMISSARY (2009) and THE MATTER WITH THINGS (2021).

McGilcrhist’s books have profoundly changed the way I think about the world. I’m not alone in this. One reviewer of THE MATTER WITH THINGS said, “It’s very simple: this is one of the most important books ever published. And, yes, I do mean ever.”

McGilcrhist has an incredible breadth and depth of knowledge. What he has done has continued to monitor and analyze the neuroscientific research on how the two hemispheres of our brains operate. And the key point is that we operate with two, semi-independent brains.

This area of inquiry fell into disrepute because the early research – the split-brain research done my Sperry and Gazzaniga - was co-opted by popular culture and became distorted and trivialized. Right brain is creative; left brain is logical. But the research continued and McGilchrist has pulled it all together and has analyzed how evolution has expanded the diversity of hemispheric operations and how culture and civilization have been shaped by either a preference for right hemisphere modes of thinking or by left hemisphere modes.

THE MOST USEFUL BODYRESEARCH

And McGilchrist’s most useful insight is that when the two hemispheres fail to collaborate, and when the LH comes to dominate our thinking – as it has in today’s world - we get a profoundly distorted view of reality, and we suffer all kinds of negative consequences. We get muddled in our thinking, our feelings, and our actions.

A HEALTHY COLLABORATIVE FLOW

McGilchrist explains that when the two hemispheres are collaborating properly, there is a natural flow of information starts in the RH. It is the RH that takes in new information and tries to integrate it into the full corpus of past learning. When a piece of information needs more analysis, it is sent to the LH, which isn’t concerned with the big picture. The LH breaks reality down into bits and pieces that can be named, categorized and stabilized for analysis. The LH creates our concepts about reality. [RH = reality; LH = concepts about reality] Then, the LH should share these concepts with the RH so that they concept can be evaluated in the context of our real lives, the lives we are really living.

It is the collaboration of these two modes of processing reality that have given the human mind such power and has resulted in the rise of modern civilization – for better or for worse.

A MUDDLED MIND

When the LH dominates and the collaboration is lost, our minds get muddled. We get stuck believing in the concepts we invent and lose faith in the reality we experience. We believe the map rather than the hills and rivers we actually encounter. We use emojis to express our emotions, rather than smiling and hugging the people we love. We put more faith in what people say they will do than in what they do.

This type of LH way of thinking goes back all the way to ancient Greece. The philosopher Parmenides, who influenced Plato, apparently argued that the phenomenal world – what we experience with our senses - is an illusion. Parmenides argued that *only something that can be thought* can have existence. If you can’t think it, it doesn’t exist. And the flip side, of course, is that if you CAN think it, it must be real. This sounds a bit like schizophrenia, doesn’t it. If you can imagine abductions by space aliens, it must be real.

I believe what the Buddhist are talking about when they say that the Self is an illusion. It is that the LH construction of a self-concept - an ego - is an illusion. It’s just something your mind made up. Because it is 2 or 3 steps removed from reality, from actual experience in the here and now. Our concepts of life are the illusions.

Now, it is impossible for me to do justice to the wealth of research and scholarship behind these assertions. Let me just lay out the basic idea - the basic structure - for mind management that I want to propose. We can take time during the Q & A get deeper into the weeds if we like.

THE ANTIDOTE – MIND MANAGEMENT

 If it is true that our mind gets muddled when we lose the collaborative flow between the hemispheres, and the LH comes to dominate, the antidote is to correct the misalignment. We must restore the collaboration of the two hemispheres and to make sure that the RH is in charge. We must give precedence to lived experience over conceptual re-presentations of reality.

It's the same basic formula we use for brain health. Reduce the risk factors – dominance of the LH misconceptions. Amplify the protective factors – make sure that we give precedence to the holistic, contextual, experiential view of the RH.

And this is where music comes into the discussion.

MUSIC & THE RIGHT HEMISPHERE

McGilchrist calls music the language of the RH. When we immerse ourselves in music, we are grounding ourselves in our RH and are ignoring LH modes of perception.

Music is grounded in the present. It is experienced right here, right now, which is where we want to be. We don’t want or need to be ruminating about the past or feeling anxious about the future. Past and future are concept. The only place we can really experience anything is right now.

Music flows across time. The dynamic power of music resides in the relationship between the notes and how they change over time. Nothing is stable and fixed. A single sustained note isn’t music. Music is found in the relatedness of different notes and different rhythms, in the “betweenness” of phenomenon. This is a very RH way of understanding reality. Reality is transient, constantly changing. We find ease and comfort when we learn to flow with the flow. We experience discomfort and pain when we struggle against the flow or try to insist that the time stand still, that things must not change.

Music is experience as a holistic gestalt - again a RH way of thinking. The LH likes to break thinks apart, to fix them in time, to resist change. Music that is broken into its component parts, and fixed in time is no longer music.

Music has its own meaning. It isn’t a concept about something else. We don’t have to be told what a piece of music means. We just experience it. We like the experience. We don’t like the experience. We are moved. Interpretations of art are LH activities, but when we just feel joyful about hearing music when we feel exuberant about making music we are fully engaged in our RHs and are – I submit – doing what we need to do to effectively manage our minds.

At its most basic this means living in your real life, the life of direct experience, rather than living in a world of concepts. Spend more time simply experiencing what is happening and less time thinking about the implications of what you think happened - or what you anticipate will happen. Live in the present - because that’s all there really is - and cut back on rumination about the past or anxiety about the future.

So a lot of my work these days involves exploring how to go about achieving this goal of rebalancing the influence of our two hemispheres. And one of the key characteristics of activities and phenomena that promote hemispheric balance involve the emotion of awe.

And music has the right combination of elements to foster this positive readjustment.

MUSIC AND AWE

The emotion of awe is an important and powerful emotion. It only arises when the RH is in control.

Dacher Keltner, a positive psychologist at UC Berkeley, has a new book on the importance of awe. It is called Awe: The New Science of Everyday Wonder and How It Can Transform your Life. Keltner has done research around the world investigating what conditions give rise to inspirational feelings of awe. The most often mentioned awe-inspiring condition was Human Morality – people being astonishingly brave, ethical and forgiving. Other wonders that are awe-inspiring are natural beauty, artistic beauty, group synchronicity, epiphany, life & death, mysticism, psychedelics and – high on the list – music. Music has the power to transport us into a state of wonder and awe.

The two main components associated with awe are first, a sense of unity and connection with something grander than ourselves. And second, a diminishment of ego (ego-centricity) and of self-interest. When we feel awe, we are humbled by the vast, wonderful mystery of life. These are the feelings associated with mystical revelation, with enlightenment and with the mind-altering effect of a psychedelic trip. These are the feelings when we are awed by natural grandeur of nature and the transcendent experience of music.

When we feel awe and connect with a larger reality we accept and revel at the beautiful mysteries of life. This is a RH activity. The LH hates mystery. It hates not knowing and understanding. The LH hates ambiguity and ambivalence. Enjoying the wonder and awe of magnificent music, therefore, diminishes LH perspectives and connects us deeply with our RH.

MUSIC, DANCE & JOY

And, of course, music is a totally embodied experience and is intimately connected with dance. Every culture across all time has engaged in song and dance which brings people together in the embrace of shared exuberance and joy.

SUMMARY

I’ll stop here so that we have plenty of time for questions and discussion. To quickly summarize my three main points:

Music is fundamental to our physical wellbeing because it is organized sound and has the power to affect positive plastic change.

Music promotes brain healthy by affecting many, if not all, of the Behavioral Roots of Brain Health in ways that promote positive plastic change.

And, finally, music fosters positive mind management by reuniting us with right hemisphere perspectives that are too often suppressed by modern civilization.

[END]