

How Music Affects the Brain

By Deane Alban

Music improves brain health and function in many ways. It makes you smarter, happier and more productive at any age. Listening is good, playing is even better.

Music has played an important part of every human culture, both past and present. People around the world respond to music in a universal way. (1)

And now, advances in neuroscience enable researchers to quantitatively measure just how music affects the brain.

The interest in the effects of music on the brain has led to a new branch of research called [neuromusicology](#) which explores how the nervous system reacts to music.

And the evidence is in — music activates every known part of the brain. (2)

Listening to and playing music can make you smarter, happier, healthier and more productive at all stages of life.

Let's take a closer look at some of the latest findings on the ways both playing and listening to music can enhance the form and function of your brain.

Musicians Have Bigger, Better Brains

If you want evidence of how music affects the brain, it makes sense to look at the brains of those who play a lot of music — professional musicians.

Brain scans show that their brains are different than those of non-musicians.

Musicians have bigger, better connected, more sensitive brains. (3)



Musicians have superior working memory, auditory skills, and cognitive flexibility. (4, 5)

Their brains are noticeably more symmetrical and they respond more symmetrically when listening to music. (6) Areas of the brain responsible for motor control, auditory processing, and spatial coordination are larger. (7)

Musicians also have a larger [corpus callosum](#). (8) This is the band of nerve fibers that transfers information between the two hemispheres of the brain.

This increase in size indicates that the two sides of musicians' brain are better at communicating with each other.

While most of us aren't professional musicians, we still listen to a lot of music — on average of 32 hours per week. (9) This is enough time for music to have an effect on the brains of non-musicians as well.

Music Can Improve Your Mood and Reduce Stress

Science has now proven what music lovers already know, that listening to upbeat music can improve your mood. Listening to and playing music reduces chronic stress by lowering the stress hormone cortisol. (10, 11)

Music can make you feel more hopeful, powerful, and in control of your life. (12, 13) Listening to sad music has its benefits too. If you are going through a tough time, listening to sad music is cathartic. (14)

It can help you get in touch with your emotions to help you heal. (15)

Music Boosts Brain Chemicals

One of the ways music affects mood is by stimulating the formation of certain brain chemicals. Listening to music increases the neurotransmitter dopamine. Dopamine is the brain's "motivation molecule" and an integral part of the pleasure-reward system.

It's the same brain chemical responsible for the feel-good states obtained from eating chocolate, orgasm, and runner's high.

Interestingly, you can further increase dopamine by listening to a playlist that's being shuffled. When one of your favorite songs unexpectedly comes up, it triggers a small dopamine boost. (16)

Playing music with others or enjoying live music stimulates the brain hormone oxytocin. (17)

[Oxytocin](#) has been called the "trust molecule" and the "moral molecule" since it helps us bond with and trust others. (18)

There's evidence that the oxytocin bump experienced by music lovers can make them more generous and trustworthy. (19)

Music Can Make You More Productive

There's abundant evidence that listening to music at work can make you a happier, more productive employee. This is especially true if you can choose your own music.

Office workers allowed to listen to their preferred choice of music complete tasks more quickly and come up with better ideas than those who have no control over their musical choices. (20)

Background music enhances performance on cognitive tasks, improves accuracy, and enables the completion of repetitive tasks more efficiently. (21, 22, 23)

The effects of music on productivity have been studied in some very specific occupations.

Software developers were happier and produced better work more efficiently when listening to music. (24)

When surgeons listened to music while operating, they were less stressed out and worked faster and more accurately, especially if they were allowed to pick the music. (25)

Music can help people perform better in high-pressure situations.

Listening to upbeat music before a game can keep athletes from choking under pressure. (26)

Music Can Make You More Creative

Music is a source of creativity, especially when it's upbeat. (27)

When study participants listened to music labeled "happy," their creativity went up. They came up with more creative solutions and a greater number of ideas than those who listened to other kinds of music or no music at all.

Interestingly, participants didn't have to like the music they were hearing to reap these benefits.

Music Can Make You a Better Person

Music has the power to bring forth our better nature.

Some rather interesting studies have been done on what researchers refer to as *prosocial* behaviors. These are voluntary behaviours intended to benefit others such as empathy, kindness, generosity, helpfulness and cooperation.

Listening to music makes people more inclined to spent time and energy helping others. (28) This is especially pronounced when music is appreciated in a group such as when dancing, playing music with others, or attending a concert.

This prosocial effect of music has been observed in both adults and children. (29, 30)

Music has been found to make children as young as 14 months more helpful. (31, 32)

The most effective music of all are songs with lyrics advocating kindness and helpfulness. A classic example of a prosocial song is [We Are the World](#) which has been performed for many humanitarian purposes.

Listening to positive lyrics can affect how kind and generous you will be and even how you'll spend your money. (33, 34)

Restaurant customers leave bigger tips when music with positive messages is played during their meal. (35)

Prosocial lyrics can even encourage coffee shop customers to buy fair trade coffee! (36)

Positive song lyrics help make people less prejudiced and fearful of those different than them. (37, 38)

The Effects of Musical Training on Young Brains

In the 1990s, the effect of music on the brain was popularized as the [Mozart effect](#). This theory purported that listening to music composed by Mozart made kids smarter.

Parents had their babies listening to the music of Mozart to give their brains a jumpstart, often even before they were born.

The accepted theory now is that, while taking music lessons as a child enhances brain function and structure, there's nothing uniquely beneficial about the music of Mozart.

Children with musical backgrounds do better in subjects like language, reading, and math and have better fine motor skills than their non-musical classmates. (39, 40, 41, 42)

Early music lessons encourage brain plasticity, the brain's capacity to change and grow. (43)

Just a half-hour music lesson increases blood flow in the left hemisphere of the brain. (44) And if kids don't stick with their music lessons forever, that's OK.

There's evidence that a little bit of music training goes a long way.

As little as four years of music lessons were found to improve certain brain functions, even when tested 40 years later! (45)

When exposure to music training begins before age seven, the brain enhancement that takes place can last a lifetime. (46, 47)

Kids who sing together in a choir report higher satisfaction in all their classes, not just music. (48)

Most studies on music and the brain have been done on school-age kids. But it looks like it's never too young to start.

Music lessons of sorts — playing drums and singing nursery rhymes — were given to babies before they could walk or talk. (49)

Babies who had music lessons communicated better, smiled more, and showed earlier and more sophisticated brain responses to music.

Music Makes Children Better Students



Many schools have cut music programs due to loss of funding, and this is widely believed by parents and educators to be a big mistake.

Music, whether taught in or outside of school, helps students excel in the following ways: (50)

- improved language development
- small increase in IQ
- improved test scores
- increased brain connectivity
- increased spatial intelligence

Counterintuitively, music can help students excel in science. Spatial intelligence, for instance, helps students understand how things work together.

This skill is critical in careers like architecture, engineering, mathematics and computer science.

Nobel Prize-winning theoretical physicist Albert Einstein was an accomplished violinist with a lifelong passion for music. (51) He believed that the theory of relativity occurred to him by intuition, and that music was the driving force. (52)

So by depriving students of music lessons, we might be depriving the world of the next Einstein!

How Music Affects Senior Brains

Just as it's never too early to start, it's also never too late to benefit from music either. Seniors who play an instrument, sing or dance reap physical, psychological and social benefits from music.

Music protects against memory problems and cognitive decline even more so than other leisure activities. (53)

Seniors with musical backgrounds score higher on cognitive tests and show greater mental flexibility than their non-musical counterparts. (54)

Listening to music has been shown to significantly improve working memory in older adults. (55)

Berkshire Hathaway CEO Warren Buffet is one of the most successful and wealthy investors in the world. He also has a hidden talent.

He stays mentally sharp at age 87 by playing the ukulele! (56)

Music Acts as a Natural Panacea

It seems that music can heal whatever is ailing you, be it a mental health disorder or neurological disease.

It can alleviate the symptoms of mood and mental disorders including anxiety, depression, insomnia, attention deficit hyperactivity disorder (ADHD), post-traumatic stress disorder (PTSD), and schizophrenia. ([57](#), [58](#), [59](#), [60](#), [61](#), [62](#))

It shows promise in treating stroke, autism, Parkinson's, dementia, and Alzheimer's. ([63](#), [64](#), [65](#), [66](#), [67](#))

It can also help with the psychological aspects of illness and can improve the quality of life in patients with cancer, dementia, Parkinson's and chronic pain. ([68](#), [69](#), [70](#), [71](#))

Listening to music reduces the stress experienced by patients both before and after surgery. ([72](#), [73](#)) It can decrease postoperative confusion and delirium that affects some elderly patients while recovering from surgery. ([74](#))

How Music Therapy Improves Quality of Life

Anyone can play or listen to music for “recreational purposes only” and still gain brain benefits.

But when professional health care help is warranted, you can enlist the aid of a music therapist.

[Music therapists](#) are trained to use music therapeutically to address their patients' physical, emotional, cognitive and social needs.

Music therapy has proven useful for treating people with autism, dementia, Alzheimer's, chronic pain, emotional trauma, and a variety of mental disorders including depression. ([75](#), [76](#))

Potential benefits from working with a music therapist include improved mood, concentration and motivation, and decreased anxiety, anger, stress and frustration. ([77](#))

You can get help finding a music therapist anywhere in the world in [this directory](#) published by the American Music Therapy Association.

The Amazing Way Music Therapy Helps Alzheimer's Patients

One of the most remarkable successes of music therapy is the impact it has on the lives of Alzheimer's patients.

Advanced Alzheimer's patients lose their ability to have interactive conversations with others and eventually stop speaking completely. But music therapy has been very successful at getting through to patients even when nothing else has. ([78](#), [79](#))

When hearing familiar music, patients often visibly "light up" and sing along.

It seems that musical memories far outlast other kinds of memories.

Caretakers and family members report that for most patients, music therapy is the best part of the day. Music therapy does more than help patients remember.

It helps alleviate depression, anxiety and agitation while improving brain function and overall quality of life. ([80](#))

Music therapy has been found to exert measurable changes in neurotransmitter levels in Alzheimer's patients, which may be one way it positively affects their brains. ([81](#))

To learn more about how music therapy is changing the lives of elderly people with serious mental decline, I highly recommend the documentary *Alive Inside: A Story of Music & Memory*.

You can rent the DVD on Netflix, or stream or [buy it on Amazon](#).

This movie chronicles the astonishing experiences of nursing home patients whose brains have been reawakened by listening to the music of their youth.

Here's a link to a short but moving excerpt from the movie.

<https://youtu.be/fyZQfop73QM>

How Music Affects Each Brain Differently

One of the most common questions people ask about music is: “What is the best kind of music to listen to?” The answer is: “It depends.”

First, consider what you hope to achieve.

For example, listening to tunes with lyrics can be distracting if you are trying to learn and process new information. (82)

However, this kind of music can actually be helpful if you are working on repetitive or mundane tasks. (83)

A surprising finding is that listening to the wrong kind of music for the situation can sometimes be dangerous!

Patients that have undergone heart surgery should not listen to heavy metal music or technosounds.

Doing so can lead to stress and even life-threatening arrhythmias. (84)

Secondly, you’ll always get more benefits from listening to music you actually *like*.

One person’s music can be another person’s noise, as any parent of a teenager can attest!

Neuroscientists can now see that music affects each person’s brain differently.

By using functional magnetic resonance imaging (fMRI), researchers have found that listening to music you like increases blood flow to the brain and brain connectivity more than listening to music you don’t like. (85)

Also, the number of areas in the brain activated by music varies depending on your musical background and tastes. (86)

Research confirms that the best type of music to increase focus and productivity should first and foremost be music you enjoy.

Additionally, it should be instrumental, have an upbeat tempo, be played at medium volume, and ideally include sounds of nature. (87)

Totaljobs.com teamed up with a music psychologist to create [The Sound of Productivity Report](#).

One interesting finding was that 79% of survey respondents would benefit from listening to music at work, while 21% would perform better in a music-free environment. (88)

You can take their [Sound of Productivity Quiz](#) to determine which category you fall into.

If you are among those who benefit from music, this interactive tool will also create a playlist just for you.

I tried it and the playlist it created was an ideal fit for me and already included some of my favourite songs.

Music Playlists for Brain Enhancement

If you want to listen to music specifically to improve your mood, learning or concentration, the music streaming service [Spotify](#) is an excellent place to start.

Spotify has millions of songs including a good catalog of brain-enhancing music. Once you create a free account, use the “Browse” function to access the “Genres and Moods” tab.

There you’ll find playlists created specifically to improve mood and enhance focus. Browse the “Mood” genre and you’ll find playlists for increasing happiness and confidence.

Other playlists are designed to energize you or calm you down.

Within the “Focus” category, you’ll find playlists specifically for concentration, focus, studying and productivity.

Once you find music that works for you, it’s easy to create your own playlists, even with a free account.



If you are looking for music to help you relax or sleep, you can't do better than Marconi Union's *Weightless*.

Its creation was a collaboration between musicians and a team of sound therapists. Its creators claim it is [the most relaxing song in the world](#) and they've got evidence to back this up.

Listening to *Weightless* resulted in an impressive 65% reduction in anxiety by reducing heart rate, blood pressure, and levels of the stress hormone cortisol. (89) In fact, this music is so relaxing that it's recommended that you not listen to it while driving!

You'll find a curated playlist of [the most relaxing songs](#) (including *Weightless*) on Spotify.

How Music Affects the Brain: The Bottom Line

The evidence is clear — playing a musical instrument or listening to music can positively affect brain health and function.

This brain-boosting effect is evident at all stages of life, benefiting everyone from babies to seniors.

Music can improve mood, increase intelligence, enhance learning and concentration, and ward off the effects of brain aging.

Music therapy can help various mood and brain disorders, and improve the quality of life for Alzheimer's patients.

No matter your age, it's never too soon or too late to fill your life with music!