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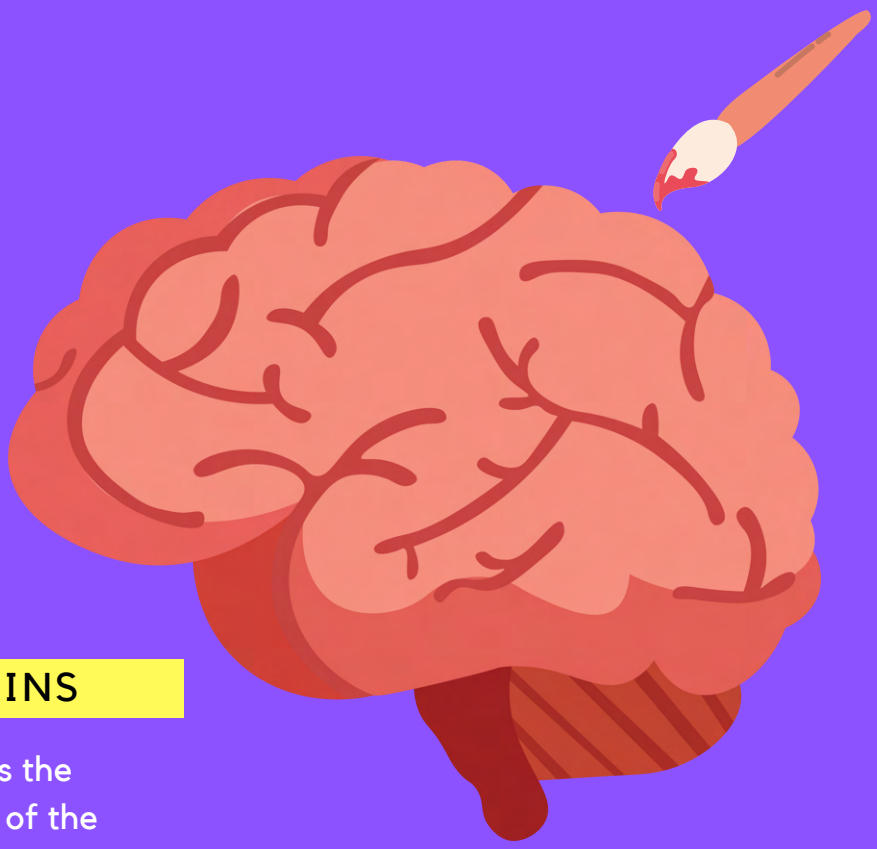
# Sensing Creativity

CONNECTING THE ARTS AND NUEROSCIENCE



## ARTSY BRAINS

How making art helps the decision making part of the brain, process emotions, and activates the reward center of the brain.

## GROOVY BRAINS

Why dancing benefits the mind and is great for mental health.

## TUNES AND THE BRAIN

The profound effect that music has on the brain.

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# Artsy Brains

Art stimulates “conceptual relations” in people’s minds. As a result, art impacts the decision making part of the brain. When creating art, many decisions are being made, such as the kind of drawing utensils to utilize. In addition, when viewing conceptual art, people view it as a puzzle. According to art historian Gregory Minissale, viewing art as a puzzle is similar to working through a mathematical proof.

For example, the same area that obtains joy from solving puzzles is stimulated by paintings by Seurat or Mondrian. Consequently, multiple areas of the brain work together to solve this “puzzle” of art, which creates a feeling of contentment. There are also other areas in the frontal lobe that communicate and join together memory, memory, experience, and learning.

However, art can also be nerve racking. Not knowing how the art piece will turn out, what to make, or what kind of materials to use are common fears and can be a cause of stress. Nonetheless, after people start to create works of art, the reward center of the brain is stimulated. This results in an increase of blood flow to the brain’s reward center, or the striatum.

Health conditions that also activate and stimulate the striatum are addictive behaviors, eating and mood disorders.

This suggests that art may benefit people that are dealing with these conditions.

As previously stated, while art can act as a source of stress, it can also help lower stress. According to a paper in Journal of the American Art Therapy Association, after measuring the cortisol (a hormone that aids the body respond to stress) levels of 39 adults after 45 minutes of creating art in a studio scene with an art therapist dramatically decreased their cortisol levels. Plus, there wasn’t a difference in health outcomes between people who were experienced artists and people weren’t. This proposes that the skill level of the artist is insignificant in feeling the stress relieving

In addition, one might find art as a stress relieving activity because while creating art, they might lose all awareness, and forget all sense of time and space. In this state, according to a paper published in Frontiers in Psychology, there is an increased theta wave activity in the frontal areas of the brain, and average or moderate alpha activities in the frontal and central areas. This, in turn, activates multiple networks, which includes, relaxed reflective state, focused attention to task and sense of pleasure.

# TUNES IN THE BRAIN

A study by researchers at Wake Forest Baptist Medical Center found that the listener's music preferences instead of the type of music had the biggest impact on the brain. This study was based on the FMI scans of 21 people, who listened to music that they liked and disliked the most among five genres, classical, country, rap, rock and Chinese opera, and their favorite song. These scans showed that music preferences had the biggest impact on brain connectivity, particularly on the default mode network, which is involved in internally focused thought, empathy and self-awareness. The study showed that the default mode network was poorly linked when the participants were listening to the music they disliked, but was better connected when listening to the music they liked. Nonetheless, the default mode network was the most connected when listening to their favorites.

The study also found that favorite songs changed the connectivity between auditory brain areas and a region responsible for memory and social emotion consolidation. These findings may suggest why similar mental and emotional states can be experienced by people listening to music that contrasts in musical genre.

Listeners who prefer classical music have often experienced stress relief through the genre. A research published in Complementary Therapies in Clinical Practice studied 180 patients and found that listening to natural sounds, classical Turkish or Western music helped reduced anxiety by lowering cortisol levels, blood pressure and heart rate. Classical music has various benefits to the listeners and increases dopamine levels leading to reduced stress and more productivity.

Listening to music while studying can help the brain process information more efficiently. "Mozart's music and Baroque music, with a 60 beats per minute beat pattern, activate the left and right brain" (O'Donnell). Studies have proven that classical music improves your memory. According to 2018 study conducted by the University of Helsinki, "listening to just 20 minutes of classical music a day modulates the genes responsible for brain function and memory". It was noted that there was an increase in dopamine secretion. Dopamine is often known as the "feel-good" hormone and impacts your ability to recall and store memories along with your concentration on a task.The ABC nursery rhyme was created to help kids remember the alphabet. Even though children can't remember as fast as adults, they are able to retain the information when they hear it in the form of music. Putting words to song helps the brain to process the information more fully.

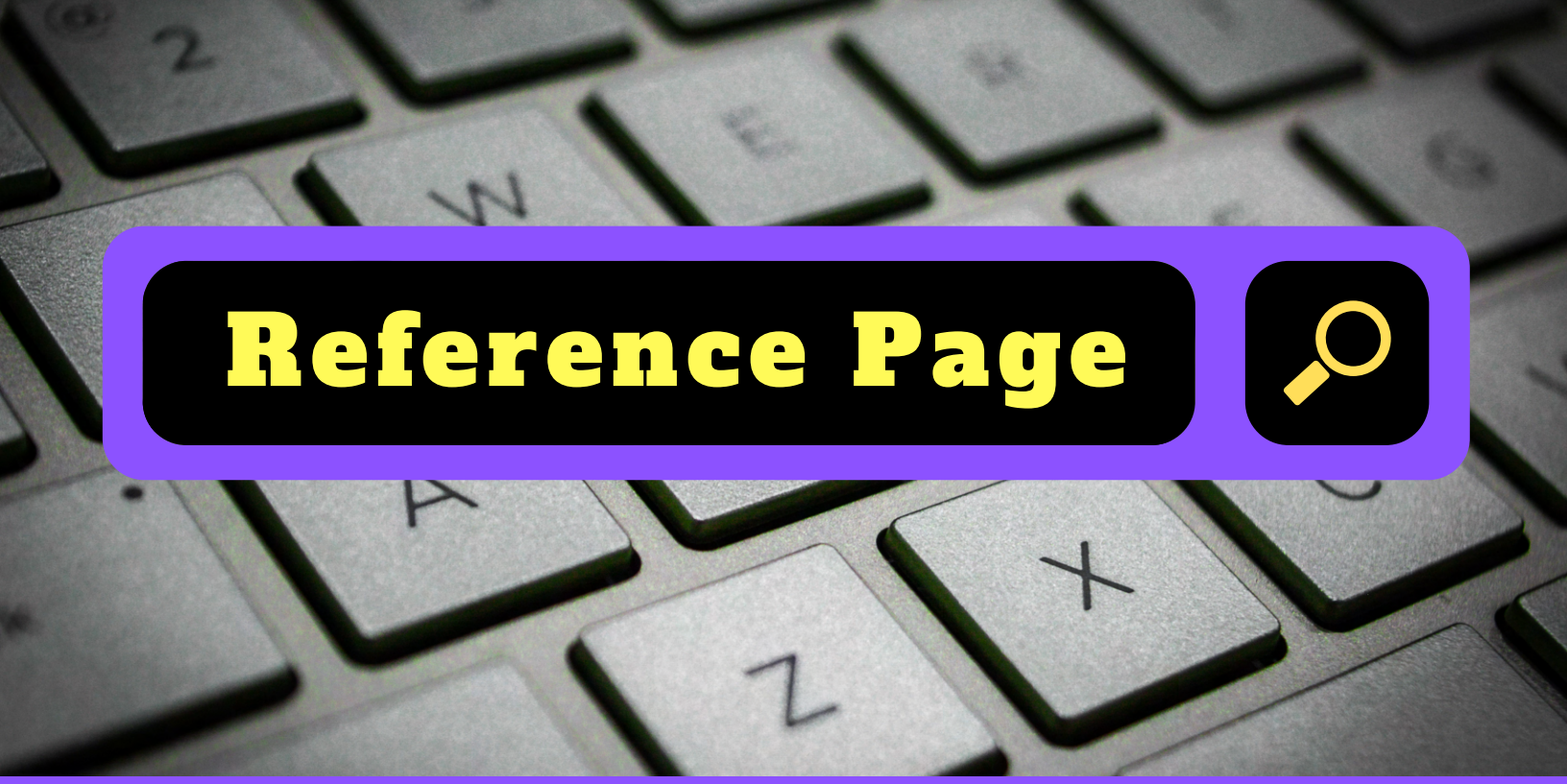
# GROOVY BRAINS

Dance is a form of art that often involves moving your body in a specific rhythm to express a story of feelings. Dancing has shown to have many positive effects on the brain. Memorizing a dance routine and the steps helps improve long term memory. According to a study done by Albert Einstein College of Medicine, “dancing is associated with 76% reduced risk of dementia among the participants”. Dancers are trained to use their spatial awareness to the best potential. They are aware of their kinesphere, and the space of dancers around them.

Depression is a common and serious medical illness that negatively affects how you feel, the way you think and how you act. Depression affects more than 350 million people worldwide and can lead to a loss of interest in various activities. Fortunately, there are ways to go about curing it, one of the methods being through dance. For many people suffering with depression and other mental illnesses, it can often be difficult to express their feelings and thoughts through words. However, through dance, those struggling are provided with an artistic portal with which they can comfortably express themselves.

Dancing with others allows you to feel a sense of connectedness and can result in an increase of social activity. A study done by the University of Oxford explains dancing alongside other dancers “lights up brain pathways,” similar to the feeling when you run into a stranger and realize you grew up in the same neighborhood which breaks down the invisible walls your brain builds up between you and a stranger. Through the different movements in a choreography, unity must be present within the dancers in order for the steps to flow smoothly. Therefore, dance often pushes the students to form a sense of community within each other.

Dance has also been proved by many studies to be beneficial and therapeutic to patients suffering with Parkinson’s disease. More than one million people have been diagnosed with Parkinson’s and each year according to the Parkinson’s Disease Foundation, the number increases by 60,000. Parkinson's disease is a nervous system disease that affects your ability to control movement. The disease usually starts out slowly and worsens over time. Through dance, patients are given a set of rhythms to move to, and over time the constant movement has shown improvement in the patients. A study done by the Parkinson's Disease Foundation claims that although there has been no comparison to music, patients with the disease, “speak and walk better if they have a steady rhythmic cue.” In addition, dance also stimulates cognitive functioning which Parkinson’s patients struggle with.



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Blumen HM, Ayers E, Wang C, Ambrose AF, Verghese J. A social dancing pilot intervention for older adults at high risk for Alzheimer's disease and related dementias. Neurodegener Dis Manag. 2020 Aug;10(4):183-194. doi: 10.2217/nmt-2020-0002. Epub 2020 Aug 3.

Campbell, Don. "Music for the Mozart Effect." Music Makes You Smarter. The Center For New Discoveries In Learning, Inc., 2008. Web. 2015.

Gharib, M. (2020, January 11). Feeling artsy? Here's how making art helps your brain. NPR. https://www.npr.org/sections/health-shots/2020/01/11/795010044/feeling-artsy-heres-how-making-art-helps-your-brain.

Jacolbe, J. (2019, June 28). Art Is Good for Your Brain. Jstor Daily. https://daily.jstor.org/art-is-good-for-your-brain/.

Music and the brain: What happens when you're listening to music. Pegasus Magazine. (n.d.). https://www.ucf.edu/pegasus/your-brain-on-music/.

NewsWire. (2019, October 11). The Science Behind Why Classical Music Is Good for Mental Health. NewsWIre. https://myscena.org/newswire/the-science-behind-why-classical-music-is-good-for-mental-health/.

O'Donnell, Laurence. "Music and the Brain." Brain And Mind. Music Power, 1999. Web. 2015.

Pepperell, R. (2011, August 17). Connecting art and the brain: An artist's perspective on visual indeterminacy. Frontiers. https://www.frontiersin.org/articles/10.3389/fnhum.2011.00084/full.

Reward system. The Reward Foundation. (2021, July 28). https://rewardfoundation.org/brain-basics/reward-system/.

ScienceDaily. (2017, April 12). Music has powerful (and visible) effects on the brain. ScienceDaily. https://www.sciencedaily.com/releases/2017/04/170412181341.htm.

Tarr, B. (2015). Dancing 'raises pain threshold'. University of Oxford. https://www.ox.ac.uk/news/2015-10-28-dancing-raises-pain-threshold%E2%80%99.

Verghese, J. (2018, March 23). Movement intervention for memory enhancement - full text view. Movement Intervention for Memory Enhancement - Full Text View - ClinicalTrials.gov. https://clinicaltrials.gov/ct2/show/NCT03475316.