

3. THE COGNITIVE BENEFITS OF ART

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Abstract: Numerous studies have shown that engaging in drawing can have a positive effect on various cognitive functions. One of the key ways that drawing affects the brain is by improving concentration. When we draw, our brains are forced to focus on the task at hand, which can help improve our attention span and ability to stay focused on other tasks as well. In people who regularly engage in drawing, brain scans have shown an overall increase in gray matter in both hemispheres of the brain. Following the scan, the old belief that artists often use the right side of the brain was dismantled. Drawing also stimulates the brain's creative processes, helping to increase our problem-solving skills and ability to think outside of stereotypes. By allowing our minds to wander and explore different ideas through drawing, we are able to come up with unique solutions to problems and think more creatively in general. The researchers analyzed the effects of images of real works of art versus reproductions displayed on volunteers' glasses inside a working MRI scanner. Real works of art had a strong positive response in the precuneus, the part of the brain involved in consciousness, self-reflection and personal memories. Gerrit van Honthorst's opera „The Violin Player” gave a positive "approach" stimulus of 0.41 out of 1 in real life. For the poster, the impact was only 0.05. Additionally, drawing can have a calming effect on the brain, helping to reduce stress and anxiety. When we draw, our brain releases dopamine, a neurotransmitter associated with feelings of pleasure and reward. This can help reduce feelings of stress and improve our overall sense of well-being. Moreover, an increased level of gray matter was also observed in the parietal lobe of the brain of the artists. The parietal lobe is the area responsible for improving spatial orientation and cognition. Drawing is used in the treatment of people with brain conditions such as Alzheimer's disease and more. Drastic improvements are observed in memory. When you look more closely at a work of art, really notice it, your brain can begin to mimic the neural activity of the artist who created it. New neural pathways begin to form and a state of inspiration is stimulated.

Key words: cognitive functions, drawing, memory, stress, creativity

1. Introduction

The biological basis of creativity remains a matter of debate. A long-held view suggests that while the left hemisphere is intelligent and analytical, the right hemisphere is the source of all creativity. Accordingly, activating the right hemisphere should enhance creative thinking, prompting a plethora of popular books offering a right-hemisphere solution to topics ranging from drawing to money management to sex. More recently, an alternative proposal has suggested that creativity is not a lateralized function; instead, it is argued that creativity arises from the interaction and integration of information in both the left and right hemispheres.

According to this view, individuals with greater interhemisphericity and/or less lateralized brains will demonstrate a capacity for creative creativity. This lucrative²⁶¹ reviews the neural basis of creativity to determine whether creativity arises from right hemisphere activation or from the interaction of both hemispheres.

The relationship between creativity and psychopathology is also examined,

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²⁶¹ Lindell, Annukka, Lateral thinkers are not so laterally minded: Hemispheric asymmetry, interaction, and creativity, *Laterality*. Jul2011, Vol. 16 Issue 4, p. 479-498. 20 p

assessing the evidence for a causal link between disorders such as schizophrenia, emission activation, and creative creativity. Although the reviewed research indicates greater right hemisphere activity during creative tasks, the interaction between many diverse, often distant cortical regions in both the left and right hemispheres is also a crucial component of creativity. This interaction facilitates the integration of a variety of separate cognitive abilities, stimulating creative thinking. As such, creativity is better conceptualized as a distributed function, rather than a purely lateralized function; more lateral thinkers have less lateralized brains.

2. The Neurological Basis of Creativity

Although creativity is commonly considered to be a cornerstone of human progress and vital to all realms of our lives, its neural basis remains elusive, partly due to the different tasks and measurement methods applied in research. In particular, the neural correlates of everyday creativity that can be experienced by everyone, to some extent, are still unexplored. The present study was designed to investigate the brain structure underlying individual differences in everyday creativity, as measured by the Creative Behavioral Inventory (CBI) (N = 163). The results revealed that more creative activities were significantly and positively associated with larger gray matter volume (GMV) in the regional premotor cortex (PMC), which is a motor planning area involved in the creation and selection of novel actions and inhibition.

In addition, the gray volume of the PMC had a significant positive relationship with creative achievement and Art scores, which supports the notion that training and practice may induce changes in brain structures. These results indicate that everyday creativity is linked to the PMC and that PMC volume can predict creative achievement, supporting the view that motor planning may play a crucial role in creative behavior²⁶². The study of the relationships between mood and creativity is long-standing. In this study, the effects of mood states on artistic creativity were investigated in ninety non-artist participants²⁶³. Mood states were induced by instructing participants to listen to self-selected happy, sad, or neutral music for ten minutes. Then, all participants were asked to make two artistic drawings. To check for mood manipulation, the Profile of Mood States (POMS) was administered before and after listening to the self-selected music.

After the mood induction, the negative group reported higher scores than the other two groups in the 'depression' subscale and lower scores than the other two groups in the 'vigour' subscale of the POMS; the positive mood group showed more vigour than the negative mood group. Yet, three independent judges assigned higher ratings of creativity and emotionality to the drawings produced by participants in the negative mood group than drawings produced by participants in the other two groups. These results confirmed that specific negative mood states (e.g., sadness) positively affect artistic creativity, probably because participants are more likely to engage in mood-repairing.

²⁶² Wenfeng Zhu, Qunlin Chen, Chaoying Tang, Guikang Cao, Yuling Hou, Jiang Qiu, *Brain structure links everyday creativity to creative achievement*, *Brain and Cognition* Volume 103, March 2016, Pages 70-76, <https://doi.org/10.1016/j.bandc.2015.09.008>

²⁶³ Palmiero, Massimiliano, Piccardi, Laura, Giancola, Marco, Nori, Raffaella, Guariglia, Paola, *The Effect of Sadness on Visual Artistic Creativity in Non-Artists*, *Brain Sciences* (2076-3425). Jan2023, Vol. 13 Issue 1, p. 149

3. The positive effects of drawing/picture

Drawing stimulates brain activity

An increase in gray matter is observed in people who regularly engage in drawing, a general increase in gray matter in both hemispheres of the brain was observed after brain scans. After the scan, the old theory that artists often use the right side of the brain was dismantled. Furthermore, an increased level of gray matter was also observed in the parietal lobe of the brain of artists. The lobe is the parietal area responsible for the development of spatial orientation and cognition.

Improves memory

The power of drawing is also used as a form of treatment. Drawing is used in the treatment of people with brain conditions such as Alzheimer's disease and not only. Drastic improvements are observed in memory. Thus, sketching, drawing helps us train ourselves in such a way that we retain more information.

The Power of Drawing Relieves Physical Pain

It's Not Just a Distraction. Who would have thought that art could have pain-relieving properties? Art therapy helps to decrease the perception of pain by shifting the person's attention away from the painful point. It's not just a distraction. It's part of learning to relax and change your mood so that it no longer takes over your emotional state. Therefore, art doesn't completely eliminate physical pain, but it is a useful tool when it comes to managing the problem.

The Power of Drawing and Consciousness

Mimics Neural Activity. When you look closely at a work of art, truly observing it, your brain can begin to mimic the neural activity of the artist who created it. New neural pathways begin to form and a state of inspiration is stimulated.

4. The major impact of artwork on the brain

A neurological study in the Netherlands has shown that real works of art in a museum stimulate the brain 10 times more than the privilege of a poster. Commissioned by the Mauritshuis Museum in The Hague, home to Johannes Vermeer's "Girl with a Pearl Earring," the independent study used eye-tracking technology and MRI scans to record the brain activity of volunteers as they looked at the real works of art and reproductions. . The volunteers, aged 21 to 65, were hooked up to an electroencephalogram (EEG) brain scanner and eye-tracking equipment. They were asked to look at five paintings in the museum, as well as posters of them in a store.

The researchers analyzed the effects of images of the real works versus reproductions displayed on the volunteers' glasses inside a functional MRI scanner. "If you want to know what people are thinking, it's better to measure than to ask. The results were extraordinary," he said. Real artworks had a strong positive response in the precuneus, a part of the brain involved in consciousness, self-reflection and personal memories. Gerrit van Honthorst's "The Violin Player" gave a positive "approach" stimulus of 0.41 out of 1 in real life. In what the poster found, the impact was just 0.05.

The research also looked at "Girl with a Pearl Earring." The popular work attracted the most overall attention. The researchers described it as a "sustained attention loop" — a triangle between the girl's eye, mouth and pearl earring,

according to theguardian.com. Erik Scherder, a professor of clinical neuropsychology invited to comment on the results, said the study highlighted the importance of culture, especially at a time when the right-wing government in the Netherlands was imposing public cuts. “It shows what it does to your brain when you see a work of art. “This is a rich environment that really makes a difference ... especially for children in the growing phase,” he said.

We've all heard that for a healthy life we need to exercise every day, eat fruits and vegetables and hydrate ourselves properly. At the same time, however, art plays a vital role for brain health. Specialists claim that practicing certain activities in this sphere could lead to the extension of life, even by up to ten years. According to a leading neurologist, daily involvement in artistic activities can have huge benefits in terms of reducing stress levels and minimizing physical and mental health problems. Talent is not an important factor, but only maintaining the ability to learn new things, even later in life, writes The Telegraph.

The process is explained in detail by Susan Magsamen, professor and executive director of the International Arts + Minds Laboratory, the center for Applied Neuroaesthetics at the Johns Hopkins University School of Medicine. Her new book, “Your Brain on Art”²⁶⁴ co-written with Ivy Ross, Google’s vice president of hardware design, brings together several studies that make a compelling case for the vital role of art in brain health. “The evidence is here: Making masks helps soldiers recover faster from PTSD, and a cancer hospital designed to enhance and enhance sensory experiences helps patients heal faster,” says Susan Magsamen.

In the book, the author draws on cutting-edge research to show that engaging in “45 minutes of art”—from coloring to dancing to music—reduces cortisol (the stress chemical) and can help us live happier and healthier lives. Her field of study is neuroaesthetics, the study of how art affects the brain. The professor also gave the example of a man with Alzheimer's who, after listening to a playlist of songs he used to love, recognized his son for the first time in a decade. “Music triggers multiple brain pathways that stimulate the auditory cortex (which processes sound), the amygdala (the seat of emotion), and the hippocampus (memory),” she says. “When we listen to nostalgic music, it activates the hippocampus, but more importantly, other areas of the brain that are also linked to memory and recall that have not been damaged,” she explained.

5. Art and well-being in old age

Any artist who has had the opportunity to do creative arts work with elders has the heartfelt knowledge that this work has a positive impact on people’s mood, cognitive vitality, and general sense of well-being. They see and feel the transformations. This article ²⁶⁵ will review some of the direct evidence that participation in arts programs does improve cognitive performance. Developmental psychologist Howard Gardner, who introduced the important concept of multiple intelligences, presented a significant challenge to the notion that intelligence is a single general capacity possessed, to a greater or lesser degree, by everyone ²⁶⁶

²⁶⁴ Susan Magsamen, Ivy Ross, *Your Brain on Art: How the Arts Transform Us*, Random House, 2023

²⁶⁵ Patterson Michael C., Perlstein, Susan, *Good for the Heart, Good for the Soul: The Creative Arts and Brain Health in Later Life*, Journal of the American Society on Aging, 2011

²⁶⁶ Gardner, H., 1983, *Frames of Mind: The Theory of Multiple Intelligences* (10th ed.). New York: Basic Books

(Gardner, 1983). Instead, he suggested that people possess different types of intelligence, each type manifesting within the context of specific tasks, domains, and disciplines. This pluralistic view of intelligence (and creativity) implies that there is no single route to the truth: only by expressing the full range of our creative intelligences can we capture the breadth, depth, and splendor of our existence throughout the life course.

In 2001, Dr. Gene Cohen conducted the first comprehensive research program to test the hypothesis that participation in the arts has health and cognitive benefits. The Creativity and Aging Study was a multisite, longitudinal study that had the goal of “measuring the impact of professionally conducted community-based cultural programs on the general health, mental health, and social activities of older adults aged 65 and older”²⁶⁷. The study was conducted in three locations around the country in conjunction with the Levine School of Music in Washington, D.C., Elders Share the Arts (ESTA) in New York, and the Center for Elders and Youth in the Arts in San Francisco—cultural programs with a diverse array of participatory arts offerings. The study used two groups from each location: an intervention group that participated in arts programs and a control group that did not.

Cohen perceived a number of possible mechanisms at work that could lead to positive outcomes. He characterized one important mechanism as self-mastery; participants develop a strong sense of control and self-confidence because of their deep involvement in the creative process. They experience and benefit from the challenge and satisfaction of artistic achievement. Artistic achievement, in this case, is distinct from accomplishing arts and crafts activities. Arts and crafts projects, often called “busy work,” may serve to keep people occupied whereas artistic activities go farther and engage the mind, body, and emotions, sparking curiosity, problem solving, and artistic accomplishment.

Complex, multi-modal arts interventions, like theater, may also cause neurological changes, stimulating positive plasticity of brain structures. Noice, Noice, and Staines²⁶⁸ speculate that “engaging in demanding, multi-modal activities might result in increased cerebral activation that, in turn, would contribute to improved cognitive performance.” If mental activities can change the brain’s structure in such a way as to make it more difficult for disease to take hold, or could stall disease progression, it might be possible to strengthen neural systems through these novel, effortful programs.

In addition to positive plastic change, complex creative interventions might contribute to the development of cognitive reserve that can protect against cognitive decline. Most theories of cognitive reserve suggest that enriched environments and cognitive stimulation across an extended time period can provide protection. Based on the results of their intervention, the Noices suggest the possibility that “adding a highly enriched multi-modal environment over a short period late in life can also produce the kinds of benefits associated with the protections offered by cognitive reserve.”

²⁶⁷ Cohen, G., et al. 2006. “The Impact of Professionally Conducted Cultural Programs on the Physical Health, Mental Health, and Social Functioning of Older Adults.” *The Gerontologist* 46 (6): 726–34

²⁶⁸ Noice, H., Noice, T., and Staines, G., 2004, “A Short-term Intervention to Enhance Cognitive and Affective Functioning in Older Adults.” *Journal of Aging and Health* 16: p. 562

6. Conclusions

Science tells us that painting/drawing stimulates memory, meaning it improves your ability to recall information, especially visual information. Painting/drawing can sharpen your mind through conceptual visualization and implementation. Some people spend all day working with non-visual information. This could make it harder to recall visual information – such as images or graphs – in the future. Painting/drawing can stimulate this area of memory, helping you recall visual information more easily.

Studies show that people with creative skills like writing, painting/drawing, and drawing are less likely to develop memory loss diseases and other cognitive problems. If you don't use your brain as you age, then you may be at a higher risk of developing cognitive problems. Painting/drawing and other creative pursuits flex your creative muscles – just like you flex your leg muscles when you go for a run. By stimulating the creative muscles in your brain, you could reduce your risk of mental decline—and the statistics back this up.

Painting/drawing does more than stimulate cognitive growth, it can also stimulate emotional growth. Painting/drawing gives people a chance to express their feelings and emotions. If you're used to using words to express your emotions, then using painting to express those same emotions might be unfamiliar to you. However, once you start painting, you'll realize something surprising: painting/drawing can release your inner thoughts.

As you paint more often, your motor skills improve. You may find that fine motor movements—like typing or using chopsticks—become easier. You may find that you can do more with your hands than before.

Some people don't use their hands or fingers often. Over time, this can lead to poor motor skills. When you paint, your brain focuses on using fine motor movements to create an image. This stimulates the part of your brain that controls motor skills, which could improve movement at any age.

Some studies have shown that painting/drawing helps you develop a more optimistic attitude. Some people become happier simply because they paint. Others become happier because they paint with other people as part of a painting class. Painting/drawing can provide stress relief, helping you forget about the worries of the world. It takes your mind off other pressures, allowing you to focus on a single task that puts you in a good mood.

Taking a painting class is like going to the gym – but for your brain. Painting/drawing doesn't give you bigger muscles, but it can boost brain power in unique ways. Some studies have shown that painting can help you develop a more optimistic attitude. Some people become happier simply by painting. Others become happier by painting with other people as part of a painting class.

Painting can provide stress relief, helping you forget about the worries of the world. It takes your mind off other pressures, allowing you to focus on a single task that puts you in a good mood.

Taking a painting class is like going to the gym—but for your brain. Painting won't give you bigger muscles, but it can boost your brainpower in unique ways. In conclusion, studies show that painting/drawing can improve cognition in several

ways. It can stimulate emotional growth, reduce the risk of cognitive decline, boost memory, and provide other powerful benefits regardless of age.

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