

# The Significance of Artistic Creativity on Treatment of Depression

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## ABSTRACT

With the introduction of art therapy and research targeting neural remodelling, the effect of art on the brain may become a potential direction of further studies. This paper mainly aims to explore the significance of artistic creativity in the treatment of depression. Through literature analysis, this paper puts forward the significance of art therapy on brain plasticity. With the introduction of art therapy and research targeting neural remodelling, the effect of art on the brain may become a potential direction of research. By analysing the literature, the significance of art therapy on brain plasticity was mentioned. By summarizing the related features of the structural changes in the brain of depressed patients, it is argued that the creative process in art therapy can stabilize the person's emotional expression, interpersonal communication; Therefore, rebuild the impacted cognitive and functional brain connections. This topic is considered to be of practical significance and provides preliminary ideas for possible future innovations and beneficial supplements to traditional therapies. Further research and analysis on the topic of art therapy have greater value in the treatment of practical treatment of Depression.

**Keywords:** Depression, artistic therapy, brain plasticity, Creativity, Brain Network

## 1. INTRODUCTION

Approximately 3.8% of the global population is affected by depression. This estimated number has surged greatly due to the impact of the COVID-19 epidemic. People's views on depression have changed over time. In the age of the Renaissance, the morbidly apathetic manifestations of depression became an upper-class fad. It was popular to believe that sadness was an outward manifestation of a noble and profound gift. According to historians, many historical and contemporary artists suffer from depressive symptoms. Examples include Ludwig van Beethoven's "constant melancholy" and Vincent van Gogh's documented recurring mania and depression. These examples have led some people in the modern era to believe that there is an essential correlation between depression and creativity and to further pursue and mimic the symptoms of depression as in the Renaissance. The pathological manifestations of depression are considered to be noble and peculiarly well characterized. Medical science generally denies the correlation between depression and giftedness, believing that depression is over-glorified by the internet. The negative impact of depression on mood challenges the patient's daily life, and the deterioration of

the condition is likely to become a serious health disorder. The impact of depression on social behaviour and work performance will result in a decrease in social productivity, thus hindering the development of society.

Conventional therapies such as CBT and drug therapy have low efficiency and high recurrence rate due to the complexity of the process, long cycle time, and low participation. Art therapy as a therapeutic tool that was thought to be limited in effectiveness by individual differences is increasingly being considered nowadays. However, comparative studies of art therapy's specific effects on the human brain and nerve system are lacking. Therefore, through the method of literature review, the specific significance of artistic creativity in the treatment of depression was preliminarily explored in this paper. . In order to explore the application and understand implications of artistic creativity in the treatment of depression, this paper contains following sections that compare the effects of depression and art therapy on the brain, then discusses the effects and mechanisms of the process of artistic creation on the remodelling of brain networks of depressed patients in order to explore the application and implications of artistic creativity in the treatment of depression.

## **2. BRAIN MECHANISM AND DEPRESSION**

The dysfunction of the prefrontal cortex, amygdala, and hippocampus is closely related to the onset of depression. The study has confirmed that changes in the structural and functional aspects of the patient's brain lead to depressive manifestations. Understanding some brain mechanisms leading to depression, namely the dysfunction of the prefrontal cortex, amygdala, and hippocampus, can help to find a treatment for patients with depression to recover brain function.

### ***2.1 The Prefrontal Cortex's Association with Depression***

The prefrontal cortex is strongly associated with depressive episodes. The primate prefrontal cortex gives primates the ability to encode, represent, and store knowledge about behaviour, including the consequences of doing (or not doing) something in a complex and challenging situation [1]. Most studies on depression have found a significant reduction in the volume of the prefrontal cortex. Prefrontal dysfunction is associated with depressive symptoms, such as attention deficits, psychomotor retardation, and executive dysfunction, and is relevant to the treatment of depression [2]. The prefrontal cortex functions differently in the depressed group compared to normal individuals. A study in 2002 noted that depressed individuals and those who had suffered from depression had lower activity in the left prefrontal lobe, which activates positive emotions than normal controls. As a result, negative emotions are produced [3]. Another study in 2021 on chronic stress altering prefrontal cortical astrocyte morphology in mice revealed that the abnormalities in prefrontal cortical function are associated with emotion regulation [4].

### ***2.2 Chain Effect on the Amygdala's Regulation Function***

The amygdala which is located above the anterior aspect of the lateral subventricular horn plays an important role in emotion regulation. Due to the interaction between the amygdala and prefrontal mechanisms, damage to the prefrontal lobe leads to impaired regulation of the amygdala. Therefore, in the absence of positive affective experiences in the left prefrontal lobe, the regulation of the amygdala decreases; resulting in a negative effect in patients [5]. Studies have shown that in the brain of patients with depression, excessive cortisol will make the amygdala larger, more sensitive and active. This leads to a disruption of the body's homing pathways and the eventual development of complex symptoms.

### ***2.3 Hippocampal Shrinkage's Connection with Depressive Symptoms***

Magnetic resonance studies on hippocampal volume in the major depressive disorder have demonstrated that hippocampal volume in depressed patients is significantly smaller than in normal controls, based on combined volumetric and magnetic susceptibility-weighted imaging (SWI) techniques. This suggests an association between reduced hippocampal volume and depressive symptoms in depressed patients [6]. A study by Greg West suggests that hippocampal atrophy increases the risk of depression, schizophrenia, post-traumatic stress disorder (PTSD), and Alzheimer's disease, among other brain disorders. In depressed brains, chronic excess cortisol decreases the rate of neuronal production in the dentate gyrus, which ultimately leads to a decrease in the number of neuronal-glial cells, causing memory problems [7].

## **3. ART THERAPY**

Art therapy was proven to be able to assist in repairing the patient's perceptions and thought patterns through the process of art making. The focus of this therapy is on the construction and enhancement of creative expression. In most cases, art therapy is used as an adjunct in combination with cognitive-behavioral therapy. In the cases such as learning disabilities of children, minors suffering from social problems, stressed adults, and those who have experienced traumatic events, art therapy is especially required to reconstruct healthy social relationships and individual confidence. The non-verbal communication opportunity provided by art therapy allows patients to express their needs and feelings in a gentle manner. Margaret Naumburg, the founder of art therapy, emphasized the "analysis" and "dynamics" of art therapy, that is, the free-associative analysis of images after free drawing.

The mechanism of art therapy has been further explored as technology develops and now categorizes into 2 types: art therapy and combined art assisted psychotherapy. The main difference is that the pure art therapy does not analyze and interpret the representative meaning of the subconscious, while the combined version interprets the patient's psychology by analyzing the symbolic meaning of art. [8] Traditionally, art therapy is mainly used to break down barriers of verbal communication, to reduce the patient's resistance, and to provide a process of healing and reconstruction. And now as the discussion of brain remodeling gradually increases, the possible impact of art therapy on remodeling and activating specific brain regions and networks may offer new directions for the reconstruction of the patient's psychological and physiological state.

## **4. ARTISTIC CREATIVITY AND BRAIN NETWORKS**

### ***4.1 Artistic Creativity and the “Mirror Neuron System”***

Robert E. Franke defines creativity as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others. Creativity does not activate or deactivate a fixed network of brain areas. Different emotions largely influence the regions that are activated. Charles limb's research using functional magnetic resonance imaging (fMRI) directly shows that the activities of the prefrontal lobe and other brain networks are highly regulated by the emotional environment.

Studies by Charles Limb using functional magnetic resonance imaging (fMRI) directly indicate that the activity of the prefrontal and other brain networks is highly modulated by the emotional context. Functional connectivity in limbic and paralimbic regions, such as the amygdala and insula, is also affected [9][10]. The mirror neuron system is mainly located in the prefrontal, premotor, parietal, cingulate, and motor areas of the human brain, and this physiological basis allows people's ability to empathize and sympathize. It is an important psychological function for communication and sharing between people [11]. The process of participating in the production of art sharpens the aesthetic empathy by activating and strengthening the structure and function of the "mirror neuron system" in several brain regions of the human brain.

In artistic experience, the mirror neuron system allows for emotional empathy between the individual and the artwork and has the role of sharing feelings and meaning. According to Molnar-Szakacs, art-making first activates the amygdala, the anterior left cingulate gyrus, and the right insula, and then projects from the brain's superior reticular activation system to the prefrontal self-awareness and self-expression areas, therefore triggering empathy [12]. In this process, art was able to improve patients' social cognition by affecting the mirror neuron system, strengthening the brain's regional network function and social empathy. Thereby it can assist the treatment through helping improve the patients with depression's neuron system.

### ***4.2 Neuroplasticity and Art Therapy on Depression***

The plasticity of the brain and nervous system allows art therapy to effectively improve the physiological state of the depressed patients. The anterior cingulate cortex (ACC) plays an important role in the pathophysiology of depression [13]. Research on art therapy suggests that the process of creating art naturally encourages participants

to engage the brain and networks affected by depression, including the prefrontal cortex, hippocampus, and amygdala. In the process of engaging in creation, brain networks are activated, leading to a gentle recovery [14]. Meanwhile, as traumatic experiences can affect the basic functions of the brain, the brain's functions can be rewired. This feature is known as neuroplasticity [15]. Art-making as a rewarding activity can positively improve mood, producing drug-like effects that suppress anxious moods. The neurological system involved in the art-making process effectively improves emotional balance.

Assessment in the recent literature suggests that the effects of art therapy and its potential impact on depression can improve cognition, balance mood, and soothe the patient's state of isolation, apathy, and anxiety [16]. Overall, it has a soothing effect. This makes follow-up intervention and treatment easier.

## **5. CONCLUSION**

Focusing on the connection between depression and artistic creativity, this study has analyzed lesions in the brain structure of depressed patients and the brain network activated by artistic creativity. The connection between the two is discussed. The implications of art therapy as an adjunctive treatment to reconstruct brain structures are summarized. Art therapy effectively stimulates and activates specific areas, namely the prefrontal lobe, amygdala, and insula, which are directly associated with depression. During the experience of art creation, the mirror neuron system is directly affected, stimulating the parts of the brain and networks affected by depression. At this point, the plasticity of the brain and nervous system enables art therapy to effectively improve the physiological state of patients.

Theoretical limitations of this study include the lack of analysis and comparison of specific examples, for example, explanatory examples of specific methods of art therapy for neural reconstruction. This result is exciting because it has been shown that people tend to believe in a potential link between art-making and depression. And art therapy can use this mindset to help patients accept art therapy more smoothly psychologically by manipulating these inspiring correlations, leading to more effective treatment.

Future research will focus on collecting more examples of the relationship between depression and artistic creativity for empirical research to obtain more findings. As research is fully developed, treatments for depression will also be refined. In the future, art therapies related to creativity may be able to effectively address the complexity of the process and the low level of involvement, and the creative direction may be the solution to reshaping the damaged brain.

However, art therapy itself does have significant limitations. The individual's subjective likes and dislikes of art will affect the cooperation, and art media will have to be changed due to constraints on the environment. Research into these areas will also be needed. While the direct study on the role of art therapy for depressed patients is needed. At the same time, the potential effects that exist between creativity and mental illness based on the correlation between the two from this perspective may be a possible direction to stimulate creativity as well as cure mental illness.

## 6. DISCUSSION

Individuals' skills and mindsets are shaped by their environment, which creates human variability. It also reflects the fact that each individual's brain is shaped differently by different experiences. Perhaps starting with the art therapy aspect will be able to make different but similar stimulations to the brain on a different basis, helping the patient to rebuild the damaged functions without stimulating the patient emotionally. The exploration of the neural mechanisms of the creative process is a good entry point for human self-awareness. This theme itself has practical value, because the creative principle is not only helpful to diagnose mental problems related to the brain and reconstruct damaged functions, but also to optimize the education of young people and improve students' ability, so as to cultivate excellent people. These outlooks are certainly promising [17].

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